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FAR FROM THE GARDEN PATH:

An identikit picture of woody ornamental plants invading South-eastern Australian bushland.

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Doctor of Philosophy
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In the words of Sir Thomas Browne

> *"Not pickt from the leaves of any author, but bred amongst the weeds and tares of mine own brain."*
>
> Religio Medici (1835 p35)

Or in the words of the ANU bureaucracy

> Except where otherwise acknowledged in the text, this thesis represents the original research of the author.

Michael James Mulvaney

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ABSTRACT

This thesis establishes a predictive model to identify woody plants with a high invasive potential in South-eastern Australia. The model evolved through a comparison of the hundred or so introduced species that have already become invasive with the several thousand introduced species which have not. Several hundred naturalised, but not yet invasive, species were also compared against the non-spreaders. In the comparisons consideration is given to three major factors:
- pressure of introduction;
- environmental suitability; and
- inherent plant attributes.

Pressure of introduction is gauged through the use of nursery catalogues for the cities of Adelaide, Melbourne and Sydney and by planting and sales records for Canberra, where one government body has been responsible for the majority of planting. The pitfalls, benefits and histories provided by these documents are discussed.

There are strong correlations between the inferred amount a particular species has been planted and the probability that this species is a bushland invader, for all four cities studied. Strong correlations were also found between period of first recorded introduction and invasiveness.

In relation to geographical origin, invasive species were found to originate from areas of similar climate to that of point of introduction, but to have a wide distribution over different climate, vegetation and soil types.

The thesis also compares the biological environment of source and introduced habitats. However, no firm conclusions relating biotic environment to invasiveness are made.

The key inherent identifying attributes of invasive woody species in South-eastern Australia are that they tend to:
- reproduce vegetatively;
- belong to the Fabaceae, Rosaceae and Mimosaceae and not the Myrtaceae; and
- are either summergreen broadleaved trees, Mediterranean evergreen shrubs or broad evergreen vines, and not mesic summergreen shrubs.

Other important attributes include:
- a large chromosome number;
- a long seed longevity;
- a middle of the range seed weight;
- early lifetime maturity;

- being dioecious;
- being ant or bird dispersed;
- belonging to the Salicaceae and Oleaceae families and not the Cupressaceae;
- and being a bush stem succulent.

Many more genotypic and phenotypic attributes, to those listed above, are examined in the thesis, but are not found to be related to invasiveness.

Another important identifying feature of invasive species in South-eastern Australia, is whether a species or a close relative of similar biology (i.e of the same genus, lifeform and dispersal and reproductive mechanism) is invasive in similar climates elsewhere.

Relationships between and amongst all the environmental and inherent plant identifying attributes of invasive species are examined. The Invasive Species Model combines and weights only those features that are required for maximum precision in identification. The model requires answers to a question concerning each of the key attributes and accrues a score, depending on the answers received. Total scores range from -300 to +400.

Scores were calculated for 791 woody species commonly planted in South-eastern Australia. None of the 286 species (36% of all common introductions) with a sub-zero score was invasive. There are only two invasive species amongst the 425 species with a invasive score below fifty. Sixty-four of the 109 species with a score over 250 are invasive. Of the ninety-one invasive species eight-one (89%) have an invasive score of above 150.

The model is able to provide reasonably accurate and consistent statements of invasive probability, but not categorical distinction. The precision is greatest when taken over the wider South-eastern Australia area than at a more specific focus. The model is also best at distinguishing groups of uninvasive rather than invasive species, a focus which has previously been ignored in studies of invasive plant species.

The application of the model, both within South-eastern Australia and globally, is tested and discussed. The basic conclusion being that the model, or a derivation, can provide a means by which the potential of a woody plant to become invasive can be gauged.

GLOSSARY

Bushland: An area of natural vegetation which predominantly comprises of species indigenous to that area.

Commonly planted species: This phrase is used to denote those woody species whose documented planting record indicates that they are amongst the 500 species with the greatest introduction pressure, in either of the cities of Adelaide, Canberra, Melbourne or Sydney.

Immigrant: An introduced species which is sparsely established in bushland.

Intrusive: A collective term for invasive and immigrant species.

Invasive: An introduced species that is dominant in at least a 400 square meter (i.e. 20 x 20m) area of bushland.

Pest: An introduced species that is invasive in at least 10 separate bushland locations.

South-eastern Australia: Unless otherwise indicated, South-eastern Australia is used as a collective term for the Adelaide, Canberra, Melbourne and Sydney metropolitan areas.

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CHAPTER 1: INTRODUCTION

"Two hundred million years ago ... all continents were jammed together in one supercontinent, Pangea ... One continent meant one arena for competition, and only one set of winners in the Darwinian struggle for survival and reproduction.... Our current reconstitution of Pangea, by means of ships and aircraft, is a matter of human culture and the careering, accelerating, breaknet beat of technology."

Crosby (1986) pp9, 12

Crosby's point is well illustrated by the relationship between the continental plates of South America and Australia. During the Cretaceous (144 - 66 million years ago) they lay on opposite sides of Antarctica, forming part of the once southern supercontinent, Gonwanaland. Both shared a basic Gonwanic flora (Gould 1982, Kemp 1981). About 50 million years ago, Australia drifted away from Antarctica, thereby separating its links with South America (Crook 1981). For tens of millions of years since then, the floras of the two continents have developed in seclusion from each other, except for a few cosmopolitan plants able to disperse across the thousands of miles of sea separating them.

In 1787, the last moment in geological time, a fleet of English ships replenished their provisions at Rio de Janiero, then sailed on to begin European occupation of Australia. Included in their stores was the cochineal plant, *Nopalea cochenillifera*, carried over the seas for the beetles that fed on it, which when squashed provided red dye, presumably used for staining military tunics (Phillip 1789 p33).

Since this first artificial introduction, hundreds of plant species have been interchanged between the two continents, either deliberately for ornamental or economic purposes, or accidentally. About 5% of these species (Groves 1986(a) and see chapter three), have been able to spread away from their areas of original human introduction, a few of them now dominating areas of once indigenous vegetation. *Lantana camara* and cats claw creeper (*Macfadyena unguis-cati)* are two of many South American plants now common in the Australian flora, while *Acacia decurrens* is an

example of an Australian plant dominant in South American vegetation (Holm et al. 1979). (Introduced species that have become dominant in indigenous vegetation, such as *Acacia decurrens* and *Lantana camara*, are here on termed invasive.)

Similar situations exist between all continents, except for Antarctica, and the exchange of organisms occurs at all levels of life. Even within a continent the uniqueness or regional nature of particular ecosystems are being reduced by the human induced exchange of biota across former barriers, such as mountain chains or stretches of desert.

1.1 The consequences of reuniting Pangea

The interchange of plants across the reunited Pangea has greatly changed the nature and pattern of formerly separated biota (Mooney and Drake 1989). The major categories of change, and examples of each, are listed below.

Altering ecosystem properties

Significant changes in community productivity and structure, soil structure, land form, nutrient cycling, water cycling and fire regime have all occurred following the invasion of introduced plants. The following examples illustrate the drastic nature of such changes.

Thickets of cats claw creeper (*Macfadyena unguis-cati)* have smothered the canopy of several remnant patches of Northern New South Wales rainforest, severely disrupting photosynthesis and productivity of this ecosystem; the invasion of false acacia (*Robinia pseudoacacia)* into the xerotherm grasslands of Central Europe has added a new vegetation strata to this community (Rejmanek 1989); the invasion of South African coastal dunes by *Acacia cyclops* has reduced the movement of sand by wind along natural dune plumes, resulting in major changes to the dune sediment dynamics (Macdonald and Jarman 1984); other invasive acacias in South Africa have increased river bank erosion once they have invaded river side vegetation (Macdonald and Richardson 1984); dense *Lantana camara* infestation of Sydney bushland has led to increases in soil organic carbon and nitrate content, effecting nutrient cycling (Buchanan 1989); the invasion of salt cedar (*Tamarix* species), a large transpirer of water, has lead to the pumping dry of swamp ecosystems within arid areas of North America

(Vitousek 1986); and the fire regime of the Mt Lofty Ranges has become more intense following invasion of introduced legumes, resulting in the death of overstorey eucalypts (Cochrane 1963).

Altering species diversity and composition

Large areas of the world that were once occupied by indigenous plant species are now occupied by non-local plants. Changes in flora also may be reflected by changes in fauna. A few examples of changes in species diversity and composition are given below.

The invasion of boneseed (*Chrysanthemoides monilifera*) on sand dunes in South-eastern Australia has been at the expense of the local *Acacia longifolia* (Weiss 1986); the natural diversity of successional communities in the piedmont of North America is markedly reduced by the invasion of Japanese honeysuckle (*Lonicera japonica*) (Nicholson and Monk 1974); in Florida, *Melaleuca quinquenervia* is able to invade the ecotone between the wet loving pond cypress (*Taxodium ascendens*) and more dryland *Pinus elliottii* and displace the cypress stands there (Ewel 1986); several rare and endangered Australian plants are considered by Leigh et al. (1984) to be under threat of extinction through replacement by exotic plants; Kruger (1989) details how the spread of introduced trees and shrubs in South Africa has favoured the extension to the range of the European starling (*Sturnus vulgaris*) and several native bird species.

Genetic mixing

Introduced species may affect local communities through inter-breeding with local species. Gleadow and Ashton (1981) record how in Melbourne bushland the invasive *Pittosporum undulatum* hybridizes with the local *P. bicolor*. Other genera in which hybridization has occurred between local and introduced species in South-eastern Australia include *Coprosma, Epilobium, Grevillea, Nicotiana,* and *Acacia* (partly Carr and Robin 1985). Introduced *Grevillea* species have hybridized with the nationally rare *Grevillea glabella,* further reducing the size of its natural gene pool (Robin and Carr 1986).

1.2 The thesis backbone

The interchange of plants across the globe, and the consequences of this, are characterised by two overwhelming features:

1 - Humans are the principal agents of introduction;
2 - The number of plant species that have become invasive is small relative to the quantity introduced.

A problem requiring solution is to determine whether some characteristics exist that can identify and predict invasive from non-invasive species, so that people may exclude or restrict further introduction of unwanted invaders. This question is the backbone on which this thesis is built.

1.3 The thesis in relation to other similar studies

Recent global concerns about the mixing of the world's biota, culminated in a series of conferences and workshops on the Ecology of Biological Invasions, conducted by a branch of the International Council of Scientific Unions. Which characteristics enable a particular species to be invasive, was a key topic at these meetings. The results that emerged were generally discouraging, with a frequent conclusion that "the prediction of invasion is not yet feasible" (Williamson and Brown 1986), and defies generalisation (Simberloff 1986; and see Orians 1986, Myers 1986, Lawton and Brown 1986, Crawley 1987).

A major reason for this lack of prediction is thought to be the large variety of factors affecting invasability. Ehrlich (1986) suggested that the most fruitful studies will be those of small, closely related groups, rather than of largescale taxonomic groupings. His argument is backed up by a few case studies, which have identified characteristics distinguishing invasive from non-invasive species of the same genus (e.g. Forcella et al. [*Echium*] 1986, Richardson et al. [*Hakea*] 1987). This approach has contributed information on both invasiveness and on how to predict which species are potentially invasive, within a genus. However, with tens of thousands of species being interchanged globally, and when a single body, such as a government nursery, may be encouraging the spread of hundreds of these species, the need for widely applicable, easily applied rules or generalisations of invasiveness is obvious. It also is essential to establish a larger framework on which taxonomic-specific studies may be compared.

Some studies of large taxonomic groupings, mainly birds and insects in biological control programs, have had success with identifying generalised invasive features (Moulten and Pimm 1986(a), Nix and Wapshere 1986,

Connor 1986, Newsome and Noble 1986). The reasons for their success, and the inconclusiveness of other studies, seem to have more to do with the way the question was approached, and the nature of the data used, than with intrinsic differences between birds and some insects and other forms of biota.

There are three groups of characteristics that may influence whether a species is invasive. A common failing of many studies, has been to disregard one or more of these groups or to study them in isolation. The three groups are:

1). **Pressure of introduction**: The timescale over which a species has been introduced, and the quantity introduced;

2). **Inherent attributes:** Characteristics possessed by species, such as dispersal or reproduction mechanisms;

3). **Environmental suitability:** Invasive species may come from particular environments or from environments similar to those into which they are being introduced. These environments can be measured by such factors as climate, soil, or vegetation type.

Another common feature of invasive species research is a bias towards the study of naturalized species, without comparisons with those introductions that have failed to naturalize. Plants successfully introduced into Adelaide, for example, tend to be either Mediterranean or South African in origin (Specht 1972). Is this because these areas have a similar climate to Adelaide, or is it simply a reflection of the large number of plants introduced to Adelaide from these areas?

In some cases, where the local biota is of recent origin, such as Britain, studies may be hampered by the inability to distinguish between the introduced and local species (Williamson and Brown 1986).

While attending the Australian "Ecology of Biological Invasions" conference, in 1984, it occurred to me that comparison of those ornamental species that have been able to spread beyond their original plantings with those that have not, could supply data for testing generalised characteristics

of plant invasiveness, without the problems apparent in most other attempts. At the recent American conference on the same topic, Moulton and Pimm (1986a) came to the same conclusion.

1.4 The advantages of studying woody species in bushland

The introduction of woody plants into a region is much more thoroughly documented, in Nursery and other historical records, than that of herbaceous species. For this reason, and because of time limitations, it was decided to collect data only on woody ornamentals. Because woody plants are slow growing and long lived they also are less likely to establish viable naturalized populations as quickly as herbaceous plants (Smith 1982 p6). Thus many woody plants may be still in the early stages of their spread away from human care, when control is feasible, and identification of potential invasive species, most useful.

Woody plants are defined as having Secondary xylem (Abercrombie et al. 1980, Penguin dictionary of biology), the presence of which is not always obvious without thin sectioning the plants themselves. Generally I have used descriptions of plants given in Liberty Hyde - Bailey Hortorium (1976) and Chittenden (1965), to decide whether they are woody. Woody plants have been taken to include, trees, tree-ferns, palms, shrubs, sub-shrubs, perennial vines/climbing creepers, or any terrestrial plant with a perennial shoot over 2m in height.

In determining which species have spread from original plantings, only species that had established in areas of natural vegetation, without deliberate human aid, were considered. A plant is deemed to have become established in natural vegetation, if the majority of its immediate neighbours, in each stratum present, are local species. The word bushland is used in this thesis as a term for natural vegetation.

There are four major reasons for restricting the study to native vegetation. Firstly, this is where most woody plants have become established, rather than in continually disturbed crop or pasture situations. Secondly, the nature of invasions into natural vegetation is in need of much study (Groves 1986(a)). Thirdly, the exercise of matching a plant's native environment, with that of the environment into which it has been introduced, will be more meaningful, if those areas greatly modified by

humans are excluded. Finally, in the study of which intrinsic features aid a plant's invasiveness, much work has revolved around Baker's list of attributes of an ideal weed (Baker 1965, Newsome and Noble 1986, Barrett and Richardson 1986, Grime 1986). Baker defines a weed as a plant, in which "*populations grow entirely or predominantly in situations markedly disturbed by (hu)man(s)*" (Baker 1986). It is important, therefore, to test whether his list of attributes is also relevant in situations not markedly disturbed by people.

South-eastern Australia is a convenient study area in that it is accessible, introduced and local plants usually can be distinguished, historical records of introductions exist, and there exists a range of environments.

Of the natural vegetation within South-eastern Australia, urban bushland is the most invaded by woody ornamentals. This is largely because the greatest concentrations of ornamental plantings are in cities, and because urban bushland experiences more disturbances, such as water and pollutant runoff, than non-urban bushland. As most invasive woody ornamentals are found in urban bushland, it was in these areas that field surveys were conducted to establish which species have spread beyond plantings. To survey a range of environments, bushland of Adelaide, Canberra, Melbourne and Sydney was searched for spreading species. Throughout this thesis the term South-eastern Australian cities is used as a collective name for these four cities.

1.5 Invasive and immigrant species

Amongst the introduced species established in bushland, some are much more widespread and numerous than others. These are the species that tend to alter markedly the communities they enter; rarely established species tend to be integrated into the communities they enter. To distinguish between detrimental and unobtrusive introduced species, plants were grouped by whether, or not, they are a dominant species in an area of at least 400 square meters (i.e, 20x20m), in which the majority of species, of each stratum present are local. This distinction is somewhat subjective. Nevertheless, it does provide a useful distinction between species that alter the communities they enter from those that do not. Following the terminology of Bazzaz (1986), introduced species dominant in a 20 X 20m area of bushland are henceforth referred to as `invasive', while sparsely

established species are termed `immigrant'. `Established', `spreading' or `intrusive' are used in this thesis as collective terms for both groups.

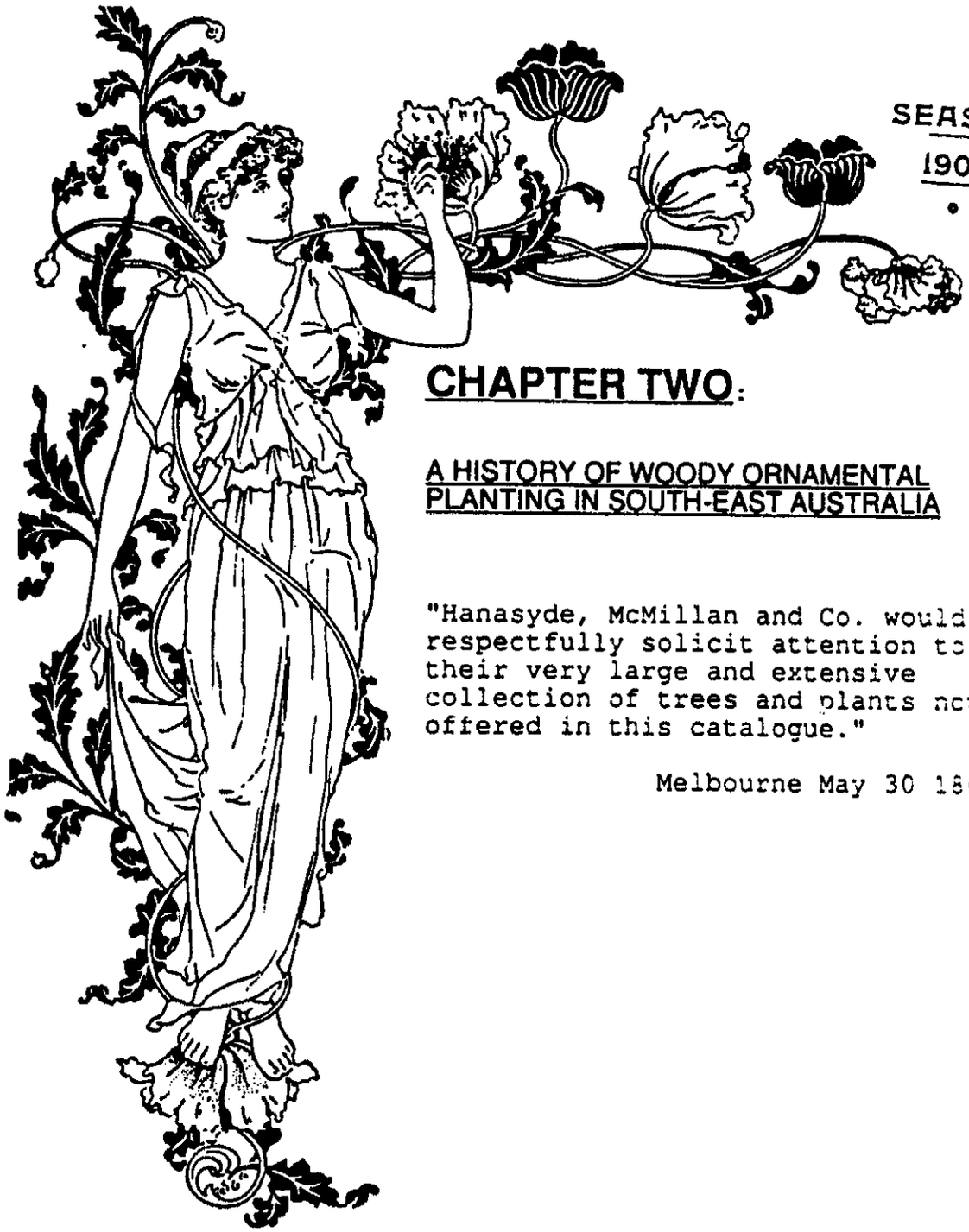
1.6 General concepts examined in the thesis.

As well as providing the basis for predicting which species are intrusive, the comparison of failed and successful introductions can test and expand many concepts of biogeography and ecology. Concepts examined in this thesis include: whether generalist or specialist species are the best colonists; theories relating to island biogeography and biological control; and soil, vegetation, and climate classifications.

1.7 Thesis outline

The aim of this thesis is to produce a model that distinguishes intrusive species from those that have not strayed beyond their original plantings by the garden path.

This objective is sought through a systematic data analysis, first involving a record of which woody ornamental plants were introduced into South-eastern Australia and in what quantities they were subsequently planted (chapter 2), which of these species have become intrusive (chapter 3), and how introduction pressure (chapter 4), environmental suitability (chapters 5 and 6), and intrinsic attributes (chapter 7) appear to influence whether or not a plant has spread from garden plantings. The relationships between these three groups of features are examined in chapter eight. Chapter nine states the conclusions reached.



SEASON
1900

CHAPTER TWO:

A HISTORY OF WOODY ORNAMENTAL PLANTING IN SOUTH-EAST AUSTRALIA

"Hanasyde, McMillan and Co. would respectfully solicit attention to their very large and extensive collection of trees and plants now offered in this catalogue."

Melbourne May 30 1864

Anderson & Co.
399 George St., Sydney.

CHAPTER 2: A HISTORY OF WOODY PLANT INTRODUCTION

Establishing the history of woody ornamental planting in South-eastern Australia is a difficult task: thousands of species have been introduced to, or redistributed around, this region. Introductions resulted from actions of numerous individuals, seed and nursery companies, or government instrumentalities. In addition, the reasons for introductions have varied according to changes in economic status, garden taste or fashion, horticultural developments and transport links.

The complexity of introduction means that it is impossible to determine all the species introduced into South-eastern Australia. It is also difficult to pin-point the year in which a species was first introduced, or the subsequent number of times it has been planted.

Ornamental planting in and around Canberra is an exception to this complexity of introduction; most plantings have involved one government body, whose activity was recorded (frequently in triplicate). Canberra's planting history, therefore, is presented separately (see 2.6).

2.1 The nursery catalogue record.

In the cities of Adelaide, Melbourne, and Sydney, nurserymen have constituted the main agents of ornamental plant introduction. A record of their activity, and hence an indication of ornamental planting, may be gained from their advertising, especially that of nursery catalogues. Commercial nurseries first operated in Sydney during the 1830s, in Adelaide in the 1840s, and from the 1850s in Melbourne. The catalogue record can be supplemented through study of letters, diaries, newspapers, journals, horticultural books, photographs, and paintings.

Since their beginnings, there have been hundreds of nurseries operating within each of the three cities. However, during each particular decade since settlement, there have always been about a half dozen nurseries that dominated plant sales. The ideal situation would be to sample catalogues from all the major and longer lasting nurseries. With this approach, one could be fairly certain that stock changes represented large scale trends, not just local differences between nurseries, or varying nursery owners or managers. In actual practice the ideal is far removed from the reality. Firstly

the dominance of many nurseries has been brief, so that it is not possible to gain an understanding of mainline nursery activity by focusing on long established nurseries. Of greater consequence is that, although most nurseries produced catalogues or price lists at regular (often annual) intervals, very little of this material survives today. "After plants had been ordered and received plant catalogues were usually discarded" (Polya 1981 p1), while when a nursery closed "Catalogues and most records were often simply destroyed, burnt, or sent to the rubbish tip." (Swinbourne 1980 p4)

For some periods there are few surviving catalogues housed in public or recorded private collections. Surprisingly, the period since the 1950s is one of the most poorly documented periods for all the cities studied. This is due partly to the large number of nurseries, and their specialization, characteristic of this period, and because even today catalogues are not routinely deposited in libraries; owners probably assume that a catalogue no older than thirty years is of little historic interest. Other poorly documented periods include the late 1860s to 1910 for Adelaide, 1880 - 1900 for Melbourne, and 1830 - 1840 for Sydney.

In spite of the relative paucity of the surviving catalogue record, hundreds of catalogues do exist. Wherever possible, for each decade since settlement I have collated lists of the woody species from catalogues of four different major durable nurseries in each of the cities of Adelaide, Melbourne, and Sydney. The number of catalogues actually researched, for each decade, are shown in figure 2.1. As the number of Australian nurseries has probably increased with population growth, the nurseries of early periods are much more comprehensively surveyed, than later ones.

Since the foundation of Australian nurseries, there has always been some inter-city trading. This type of activity is usually not well documented, however, so that the plant lists are based, almost exclusively, on local nurseries. This is further justified by the reasoning that the influence of a nursery usually will be greatest in its home city. Records of specialist nurseries, concentrating on such sales as fruit trees, roses or Australian natives, were only used if no other catalogues were available. Generally the type of stock carried by specialist nurseries, at a particular period, are reflected in the lines sold by the more general, usually larger nurseries, of that period. A bibliography of all nursery material collated is given in

appendices 1 -3, while the major nurseries of each city, over thirty year periods, are given in table 2.1. This table was constructed after consulting Polya 1981, Swinbourne 1980, Swinbourne Pers. comm., Ericksen 1974, Rumsey 1934, Burke 1984, Anon 1957, and the trade directories listed in the back of The Seed and Nursery Trader journals 1935-1970.

The identifiable stock carried by the different nurseries is shown in appendices 1- 3.

2.2 Inherent problems of the catalogue record

Beside the fluctuating nature of nursery businesses, and the meagre catalogue collections, there are several other problems that hamper the documentation of plant introduction and use. These problems are described below.

Grouping of species, or plant type

Individual species are frequently not listed in catalogues but grouped together, under a heading such as Hydrangea, Acacia, or small conifers. This may not be a great problem, however, because grouping rather than separating particular species, may be indicative of low sales and low customer interest in these species. Law, Somners and Co.'s, 1865 listing of Acacias as *"various sorts,"* fits well, for example, with the small and unhighlighted listing of Acacias in other Melbourne catalogues of that period.

Incomplete listing of stock

Catalogue listings may be restricted only to those plants held in quantities large enough to ensure their supply. The range of stock carried by a particular nursery, however, has always been a key advertising feature of catalogues. Nurserymen frequently assure their customers that they have "*spared neither time nor expense to make* (this) *collection as extensive as possible*" (Bailey 1845), or that listed in their catalogues "*will be found all the popular and useful evergreen and deciduous trees and shrubs that have proved hardy in Australia*" (Cheeseman 1910/1911). Because of the prestige associated with having a large range of stock, it also may have been tempting for some nurserymen to list some plants in their catalogues that were not in stock.

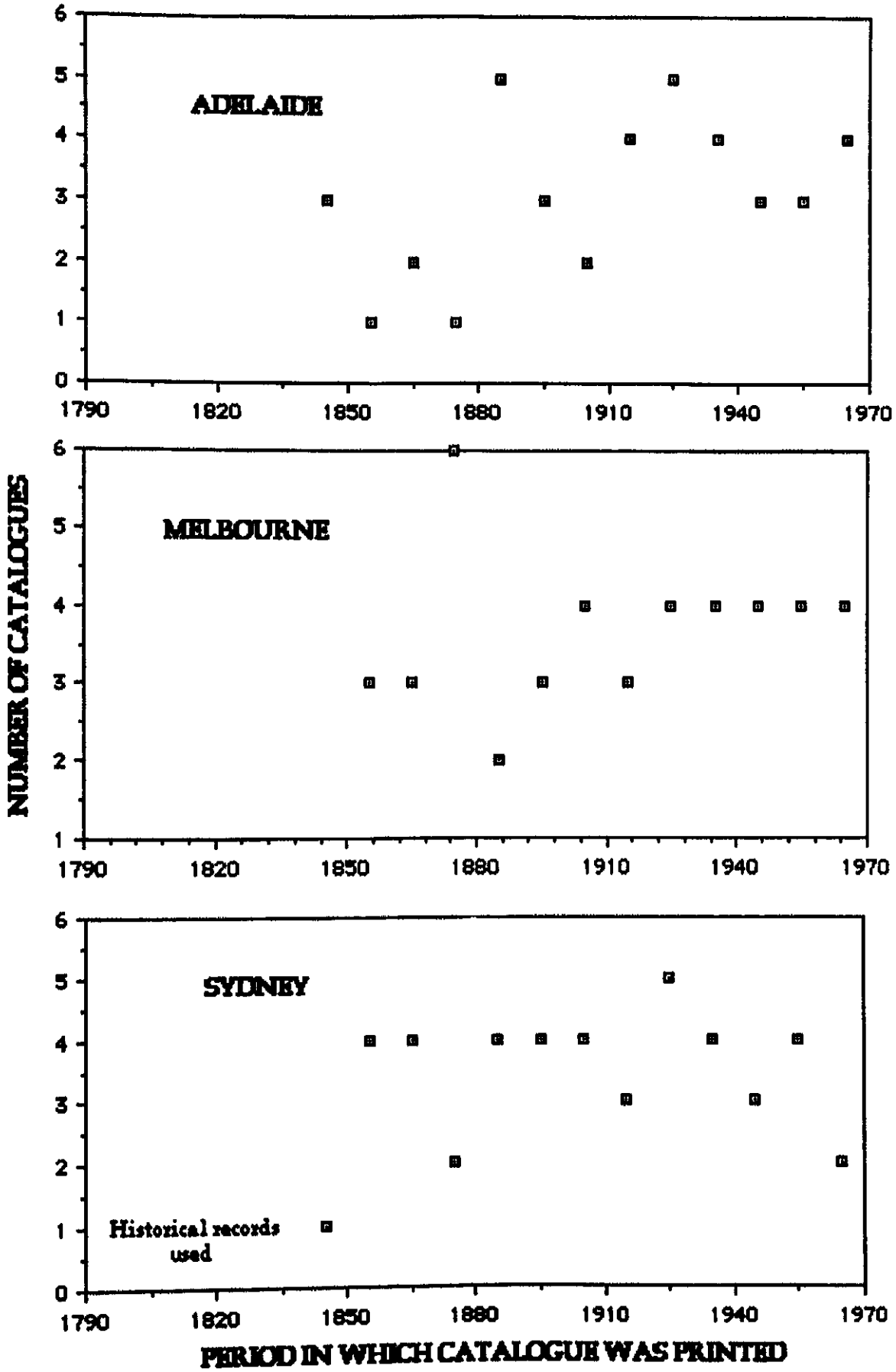
Table 2.1

THE MAJOR GENERALIST NURSERIES THAT HAVE OPERATED IN SOUTH-EASTERN AUSTRALIA

PERIOD	SYDNEY	MELBOURNE	ADELAIDE
1788 TO 1830	GOVERNMENT FARM	———	———
1831 TO 1860	SHEPERDS W. MACARTHUR GUILYFOYLES J. BAPTIST	J. J. RULE D. BUNCE	J. BAILEY C. GILES + SON (Grove Hill, Magill)
1861 TO 1890	SHEPERDS ANDERSON + CO. F. FERGUSSON J. + W. GELDING S. PURCHASE	BRUNNINGS RIMINGTONS CHEESEMANS	HACKETTS NEWMANS SEWELLS HEYNES
1891 TO 1920	YATES ANDERSON + CO SHEPERD + SONS	BRUNNINGS RIMINGTONS CHEESEMANS LAW SOMNER + CO GILL + SEARLE NOBELIUS	HACKETTS LASSCOCKS BELAIR (Government Nursery)
1921 TO 1950	YATES HAZELWOODS SWANES ANDERSONS TOMKINS (Enfield)	CHEESEMANS HODKINS RIMINGTONS LAW SOMNER + CO NOBELIUS WARNERS NURSERIES (Burwood)	LASSCOCKS KEMPS BELAIR HACKETTS HARRIS & SCARFE
1951 +	SWANES CREMORNE GRACE BROS. SHERRINGHAMS	GREENERY GARDEN AND LEISURE CENTER DINSAN ASSOCIATED NURSERIES	LASSCOCKS KEMPS ENGELS

NOTE: WHERE THEY ARE NOT GIVEN ADDRESSESS OF NURSERIES CAN BE GAINED FROM APPENDICES 1- 3.

Figure 2.1. THE NUMBER OF CATALOGUES USED TO ESTABLISH HISTORICAL STOCK HOLDINGS



Typographical errors

If the spelling in Sewell's 1920 Catalogue is taken at face value, for instance, it must be assumed that he was selling *Leucophaea*, a genus of European cockroach! The notes accompanying this listing, make it clear however that Sewell is offering for sale a shrub, *Sideritis*, a member of the mint family, which is also known by the synonym, *Leucophae*. Other misspellings or misprintings, such as the difference between microcarpa and macrocarpa, or obtusa and obtusata, may not have been so obvious.

Reliance on the ability of nurseryman to identify and name stock correctly

Ronald Gunn, one of Tasmania's first botanists, is quoted as writing to his Victorian counterpart, Baron von Mueller, that *"Bunce was celebrated for giving any hard name to any unknown plants in his Nursery."* (Polya 1981). Bunce, a former resident of Tasmania, became one of Melbourne's first locally based nurserymen.

Shared names

It is fairly common for one name to have been used for several different species. Deciding upon which species a particular application of a shared name refers may be arbitrary. A typical example is the name *Edwardsia microphylla* which has been applied both to *Sophora tetraptera* and *Sophora microphylla*. In some cases the confusion of shared names can be sorted out by accompanying descriptions of the plants provided in some catalogues. However, plants are frequently listed without a description, or with descriptions that are to brief to provide the means of distinction. This is the case with *Edwardsia microphylla*, as both *Sophora* species are yellow flowered trees. To ignore shared names completely would underestimate the availability of a particular species, so I have tried to follow nursery trends. In this example nursery catalogues before 1900 list either *Edwardsia grandiflora* or *Edwardsia microphylla*, but not both together. *Edwardsia grandiflora* is only a synonym of *Sophora tetraptera*. Thus I arbitrarily decided that the listing of *Edwardsia microphylla* before 1900 referred to *Sophora tetraptera*, but after 1900 to *S. microphylla*. With any trend, however, there always are exceptions, which produce errors.

Where a name may belong either to a plant listed in horticultural literature of the period of usage, or to one not listed in this literature, it was assumed

to belong to the horticultural plant. A list of the species which have shared a common name can be gained from Appendix 5.

Synonymy

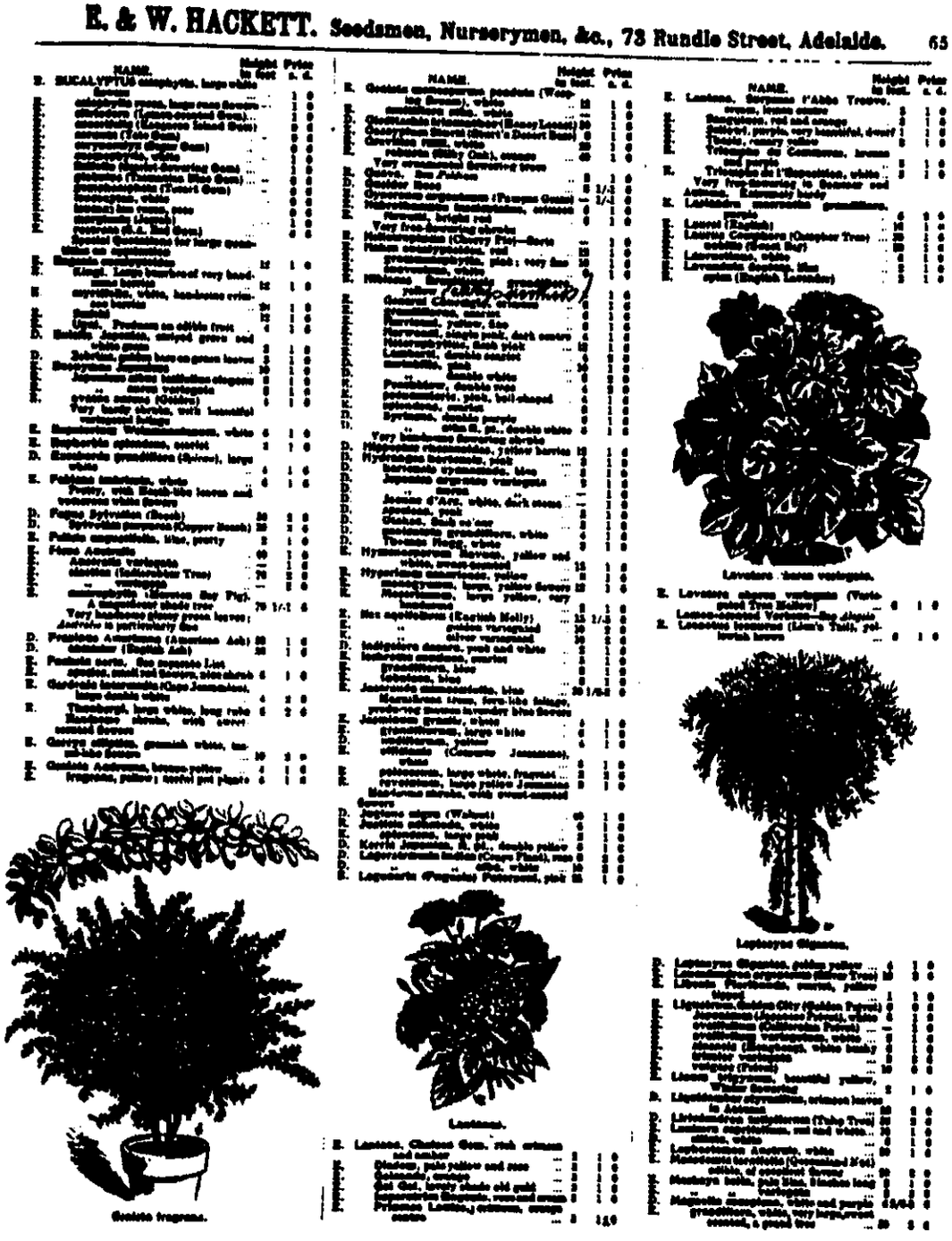
The problems listed above are of little importance, when measured against that of synonymy. On average, for every three names listed in a catalogue, one of them will be a false name. *Cordyline terminalis* (Good luck plant), an extreme example, is listed under at least sixteen different names, and one wonders whether its common name reflects the luck one needs to sort out the confusion of its nomenclature. To complicate matters further, cultivar names are frequently elevated to the species level. As an example *Euonymus japonica `Albo- marginata'* is listed frequently as *Euonymus marginata*. This is particularly confusing because *Euonymus fortunei `Marginatus'* also may be listed as *Euonymus marginata*. Conversely a species may be lowered to the level of cultivar, an example being the African Olive, *Olea africana*. William Macarthur undoubtedly introduced the African olive to Australia, soon after European occupation. Yet his catalogues record only `six varieties of [European] olive' and an `American olive.' (Dellow et al. 1987). Around 1900, Anderson's catalogues also listed an ornamental European olive, which was probably the African olive.

The origins of cultivars may also be unknown or uncertain and may in fact be hybrids of multiple parentage. A list of cultivars which could not be traced to a particular parentage is contained in Appendix 5.

Due to the confusion associated with cultivar names, catalogue records of those genera containing numerous cultivars, namely *Fuchsia, Pelargonium, Rhododendron* and *Rosa*, were not collated. In addition, only a brief attempt was made to unravel the variety names associated with plums, so that *Prunus* listings in appendices 1-3, should be regarded with suspicion.

Cultivar varieties were for several species, such as *Lantana camara* or *Hydrangea macrophylla*, the only listings of a "species" within certain catalogues. So as not to under estimate the planting record of those species which were only listed as cultivars, a listing under a cultivar name was

Figure 2.2. INHERENT PROBLEMS OF THE NURSEY CATALOGE RECORD



E. & W. HACKETT. Seedsmen, Nurserymen, &c., 73 Rundle Street, Adelaide. 65

This page from E. W. Hackett's 1912 catalogue contains 145 listings of woody plants, including a grouping of fuschias and helioptropiums, 44 plant synonyms, 5 listings which can't be assigned to any particular species and 23 listings which have elevated cultivar names to the level of species. This page is fairly typical with regard to the frequency of problems encountered when establishing a planting history using nursery catalogues.

equated with a listing under a species name. There are two major misgivings with this approach, firstly a cultivar may best be thought as a distinct identity, and secondly cultivar names may have been wrongly assigned to a species by Liberty Hyde Bailey Hortorium (1976), which was the authoritive source used in this thesis. Cultivar names were applied to 376 of the over 4,000 species listed in Appendices 1- 4. For many of the 376 species both a cultivar and the species name would have been listed in catalogues.

Rather than spend an immense amount of time researching the correct and current names of species, Liberty Hyde Bailey Hortorium (1976) was chosen as the authority. It was, when I began this thesis, the most extensive recent listing of ornamental plants, also providing descriptions of these plants, that may be compared to those given in some of the catalogues.

In nearly all cases, the authorities for the plant names used in appendices 1-4 and 7 can be gained from Liberty Hyde Bailey Hortorium (1976) and Hnatiuk (1990). Other references of particular use in determining correct names for synonyms include Durand and Jackson (1902), Hill (1926, 1929, 1933, 1938), Hill and Salisbury (1947), Jackson (1895), Prain (1906, 1913, 1921), Taylor (1959, 1966). Johnson (1860), Loudon (1840), Nicholson (1889), Guilfoyle (1912), Kelsey and Dayton (1942), Rehder (1947), Jacobsen (1974), Flora of Australia (1981-1986), Graf (1982), Anon (1986), Bodkin (1986), Jessop and Toelken (1986), Willis (1972), Beadle, Evans, and Carolin (1972), Tutin et al. (1964 - 1976), Chittenden (1965) and Bailey (1919, 1930).

Plant catalogues themselves, also provide much information on synonymy. This may be either directly or indirectly, whereby a plant synonym can be traced by its accompanying description, allied with a common name, such as 'fiddlewood' or sycamore tree.

A full list of the 1,900 identifiable plant synonyms used in the 150 catalogues studied is given in appendices 5 and 6. A further 1,150 names, which could not be identified, are also listed. It is likely that many of the unidentified names refer to herbaceous species.

Due to the problems discussed, it is likely that several misapplications of names have occurred. Readers with an interest in the catalogue recorded history of particular species therefore should consult all the appendices.

2.3 Benefits of the catalogue record

As discussed the catalogue record is hampered by its somewhat improvised nature, and confusion associated with plant naming. The record does not provide absolutes, such as information that a species was first sold by a nursery in this year, or that species A has been sold by some factor more or less than species B. However, the record does provide a means of gauging which species have been planted in South-eastern Australia. At the very least, the presence of a species in a particular catalogue indicates that it was available in a particular city at a particular time, while absence from all catalogues of a particular period suggests that it was an infrequent planting, during this period. It also is a fair assumption that a species sold by a large number of nurseries, will have been planted more frequently than a species that has been listed for sale by only one or a few nurseries. This assumption was also employed by Harvey (1989) when analysing eleven catalogues from 1850 to 1860, as a guide to plantings of that time in Illinois, United States of America.

Catalogues as an historic source also tend to reflect general planting trends for a whole populace. This may not be the case for a historic record gauged from the activities of botanic gardens, which in many cases have propagated 'specialist' 'trial' or 'rare' species.

The catalogue record obtained for this thesis consists of over 5,000 species, and, as the majority of listings involve no synonymy, one may be fairly confident that conclusions drawn from the record will not be overtly affected by wrongful exclusion or inclusion of some plant records. The size of the catalogue record means that it is robust.

2.4 Catalogue documented trends in the history of Woody Ornamental plantings in South-eastern Australia.

Several trends emerge from the catalogue record. These trends have a direct relationship with the type of species that have had the greatest opportunities to spread from garden plantings and invade bushland (i.e,

those that have been planted for the longest time and in the largest quantities).

Some historical trends in garden plantings of Adelaide, Melbourne and Sydney are illustrated in figures 2.4 to 2.18. These graphs were constructed by averaging for particular decade(s) the percentage of listings that particular groups of plants occupy in catalogues or historical records. Catalogues or other records containing fewer than fifty species were excluded, because percentages obtained from them are markedly effected by a few species, and hence vary greatly and inconsistently from the mean values based on larger records. Catalogues from the few specialist nurseries used, were also excluded.

Graphs for South-eastern Australia were also constructed by combining all catalogues that list over 200 species. Generally the number of different species listed from the various periods have remained fairly constant (see figure 2.3). Thus, in most cases, percentage differences reflect comparable numerical differences. It should be born in mind, however, that the numbers of species listed before 1850 are fewer than those for periods after 1850, while there is a tendency for catalogue listings to have become smaller since about 1950.

1790- 1820. The hungry years of settlement

The essential preoccupation of the first European settlers was survival. With food supplied by infrequent, unreliable shipping, the colony was often on the verge of starvation. In 1790 the weekly ration per person was $2^1/_2$ pounds of flour, 2 pounds salted pork, and 2 pounds of rice (Collins 1804 p.81). As late as 1809 the lieutenant governor urged *"Every person possessed of a garden to raise as great as quantity of vegetables as possible,"* if famine was to be avoided (Sydney Gazette, 6 August 1809). It is not surprising, therefore, that three quarters of the woody plants recorded as growing in Sydney before 1810, were economic plants that could be used as food, medicine, dye, or building material (see figure 2.4).

The majority of these early introductions had a tropical origin, with a third originating from Asia (figure 2.5). This was probably because the greater distances from Australia to the more temperate lands of Europe or North

Figure 2.3. NUMBER OF IDENTIFIABLE SPECIES LISTED IN NURSERY CATALOGUES

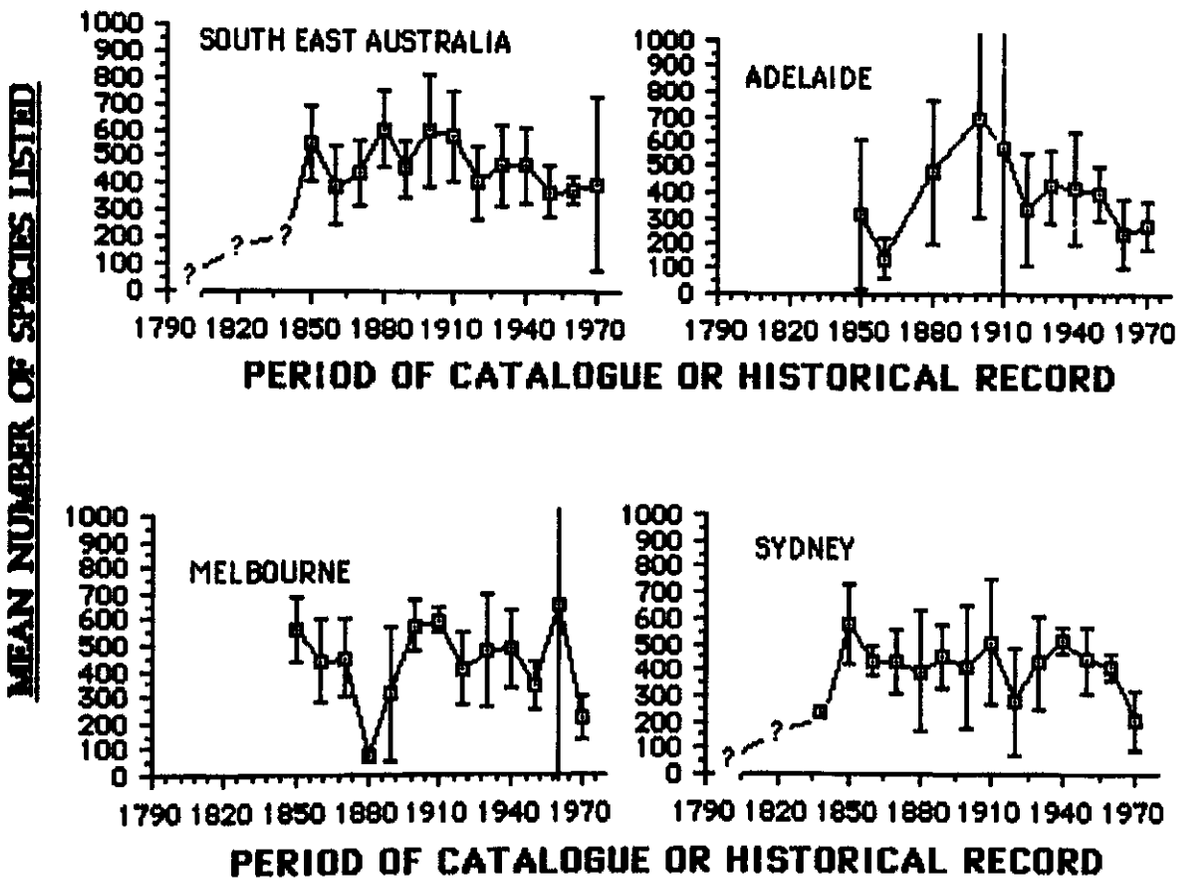
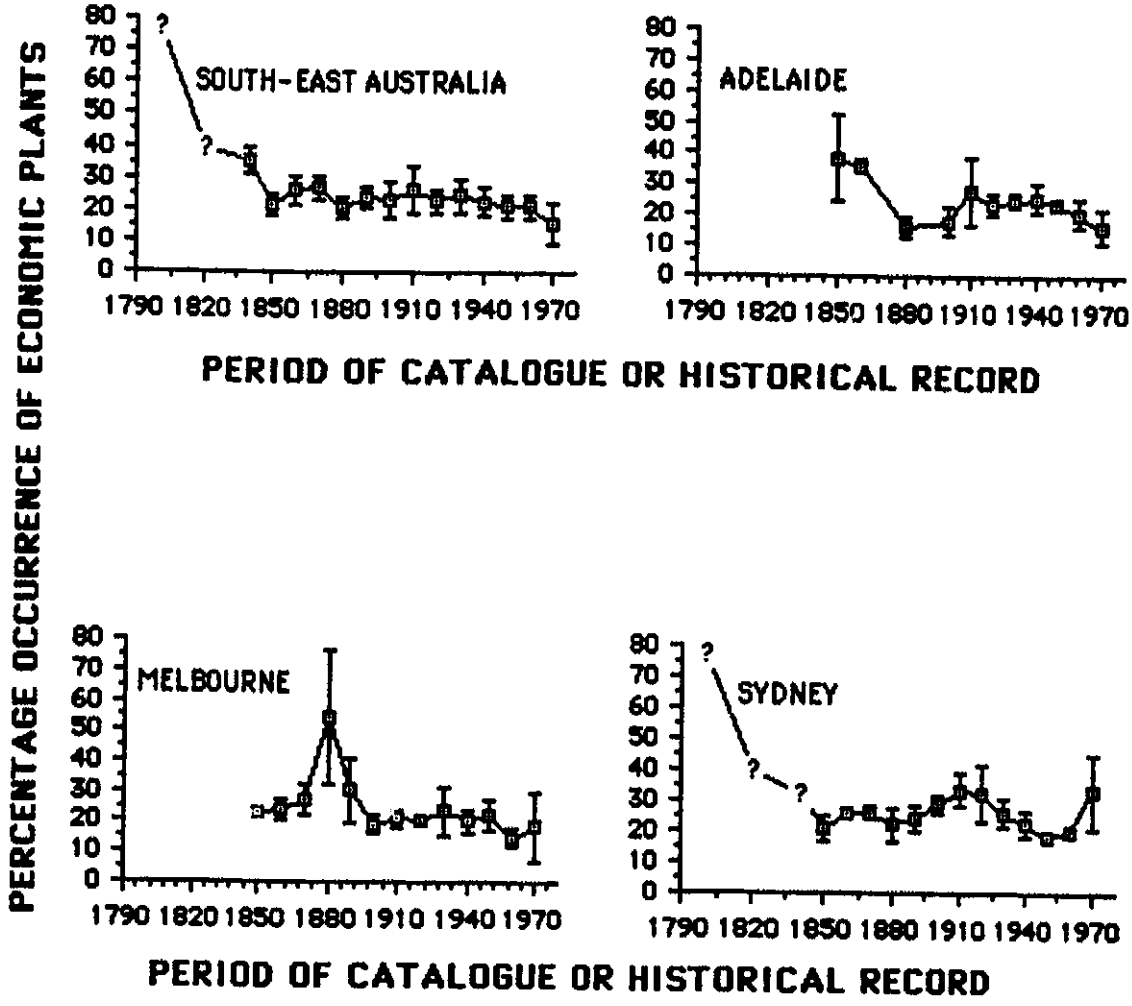


Figure 2.4 THE PROPORTION OF ECONOMIC PLANTS LISTED IN NURSERY CATALOGUES



I = STANDARD ERROR OF VARIATION AMONGST CATALOGUES OF THE SAME PERIOD

? = RECORD BASED ON NON-CATALOGUE SOURCES

Figure 2.5 THE PROPORTION OF ASIAN PLANTS LISTED IN NURSERY CATALOGUES

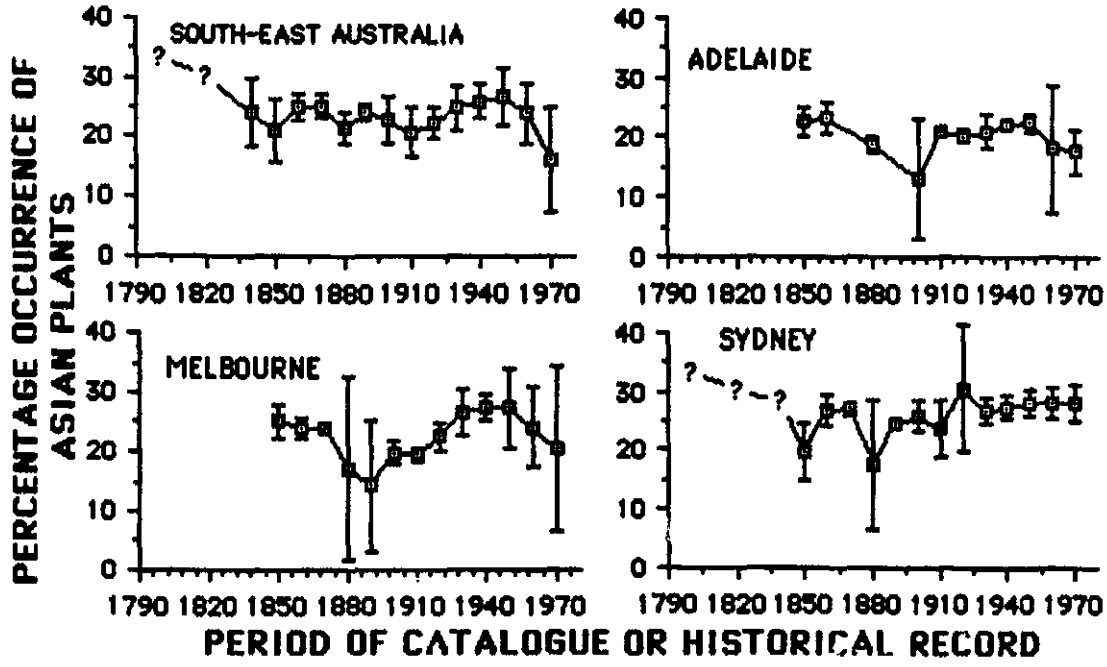
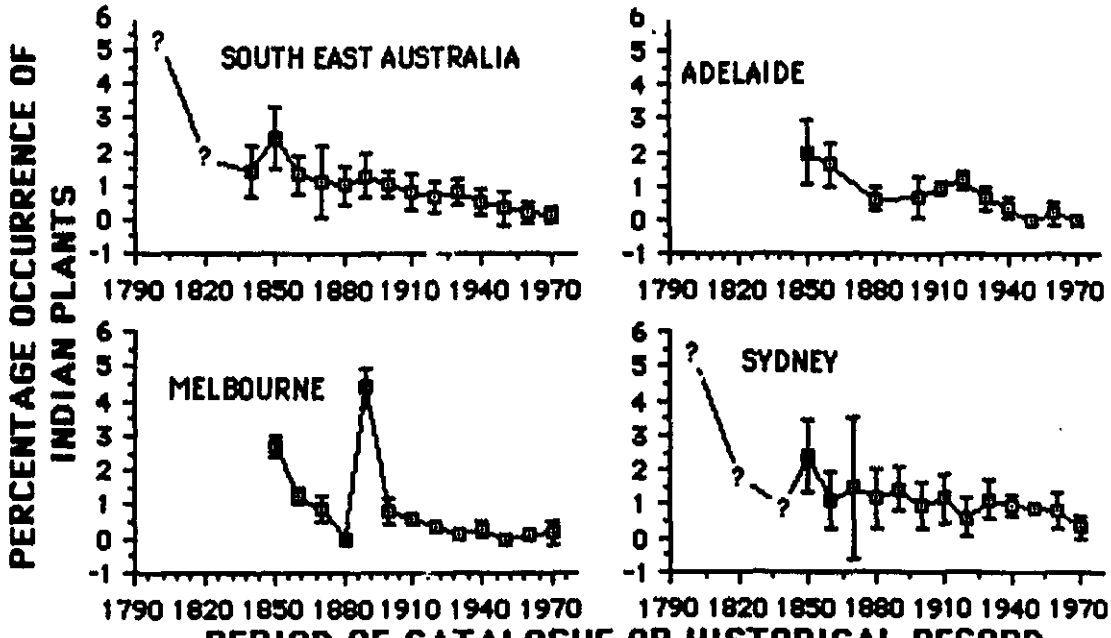


Figure 2.6 THE PROPORTION OF INDIAN PLANTS LISTED IN NURSERY CATALOGUES



I = STANDARD ERROR OF VARIATION AMONGST CATALOGUES OF THE SAME PERIOD

? = RECORD BASED ON NON-CATALOGUE SOURCES

America meant longer sea voyages and increased likelihood, either real or perceived, of plant material deteriorating. It is known that rather than risk deterioration of seed and plants on the long voyage from England, the first fleet obtained garden stock from Rio and the Cape of Good Hope (Collins, Rumsey 1934). It appears, however, that no woody plants native to the Cape were obtained.

Another possibility, of the early popularity of tropical plants, is that the experience of plantings elsewhere in the British Empire, had taught the planners of the First Fleet that tropical plants were the best suited to the climate of the new colonies. It also may be a factor that many of the free settlers and army officers that came to New South Wales had lived in India, and may have been attached to particular Asian plants. During this period, plants endemic to the Indian sub-continent formed a greater proportion of plant listings than any period since (figure 2.6). As food supplied to the struggling early settlers was largely brought from India (Collins 1804 p81), it is also probable that these shipping links were another important factor.

Even so, by 1810, plants from every continent (excluding Antarctica) had been imported. European plants made up approximately 30% of the total, which is higher than any later percentage (see Figures 2.7- 2.9). Nearly all European species, were food plants. Their predominance probably reflects more the prevailing trends in European cuisine, than the need to create momentos of a European homeland. Although such European species as briar rose (*Rosa rubiginosa*), broom (*Cytisus scoparius*), and gorse *(Ulex europaeus)*, were brought to Australia by 1810, they formed less than a third of all "purely" ornamental species planted in the colony, and even they may have been intended to delimit field boundaries. The proportion of European ornamental momento plants could however be higher, as non-European plants, such as the weeping willow *(Salix babylonica)* had been widely planted and naturalised in Europe by the time of the settlement of Australia.

1810- 1850. Gentlemen importers

After 1810, Sydney became increasingly self sufficient, and shipping routes were more regularly sailed. With their basic needs provided for, the more well-to-do could turn their attention to purely ornamental plantings. The

Figure 2.7. THE PROPORTION OF EURASIAN PLANTS LISTED IN NURSERY CATALOGUES

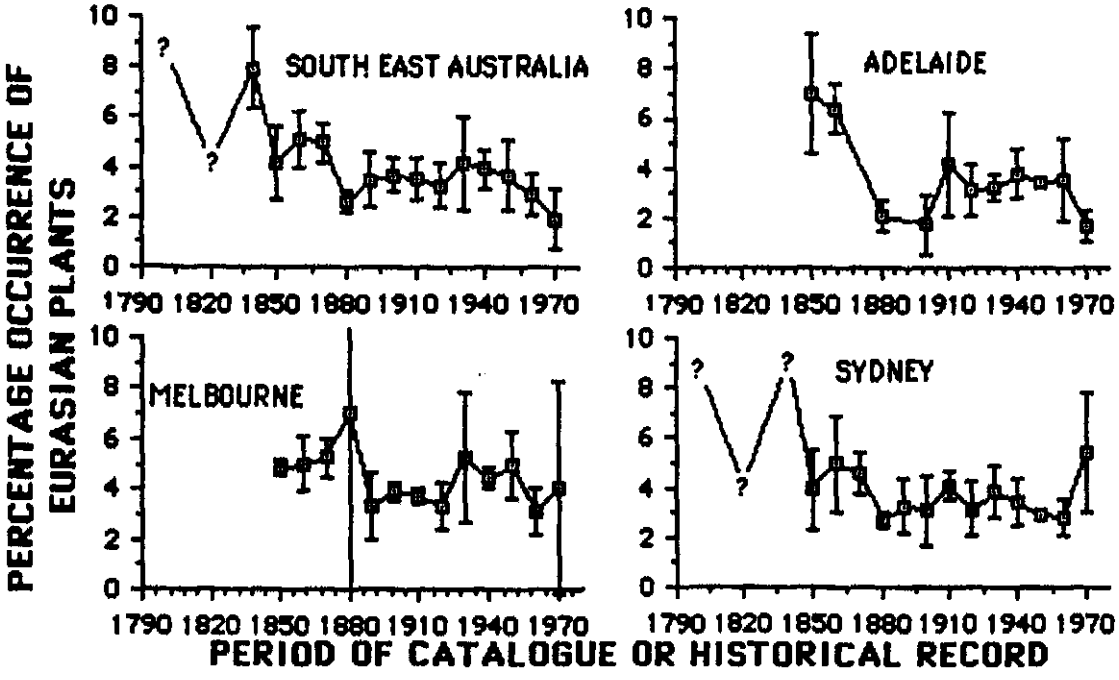
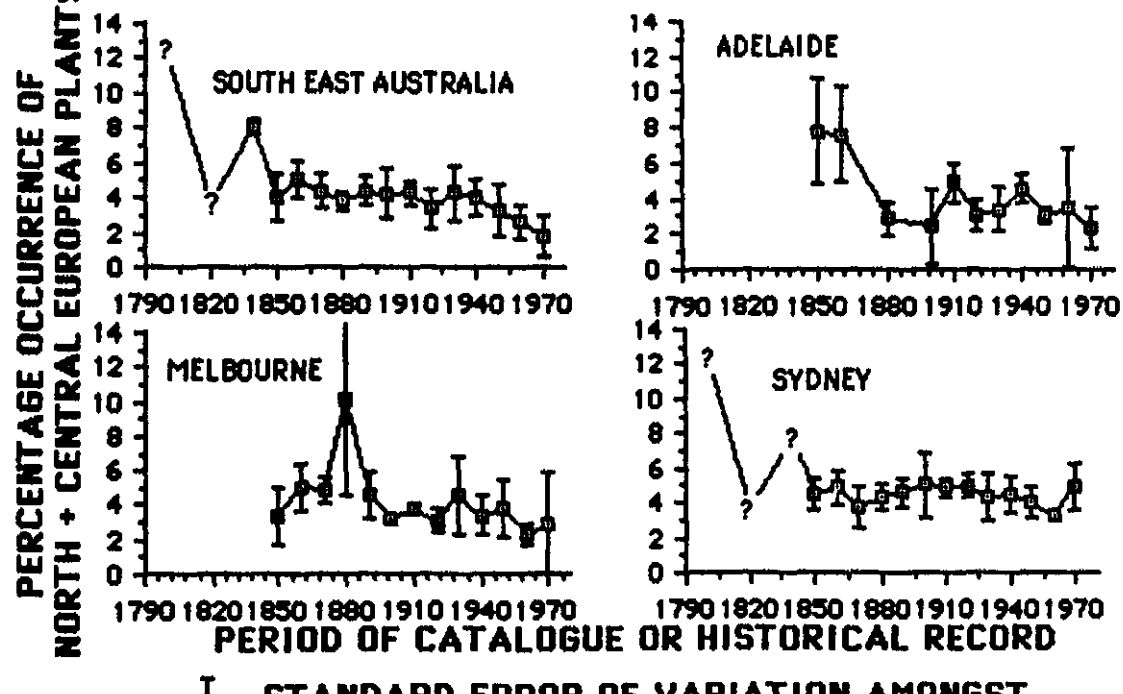


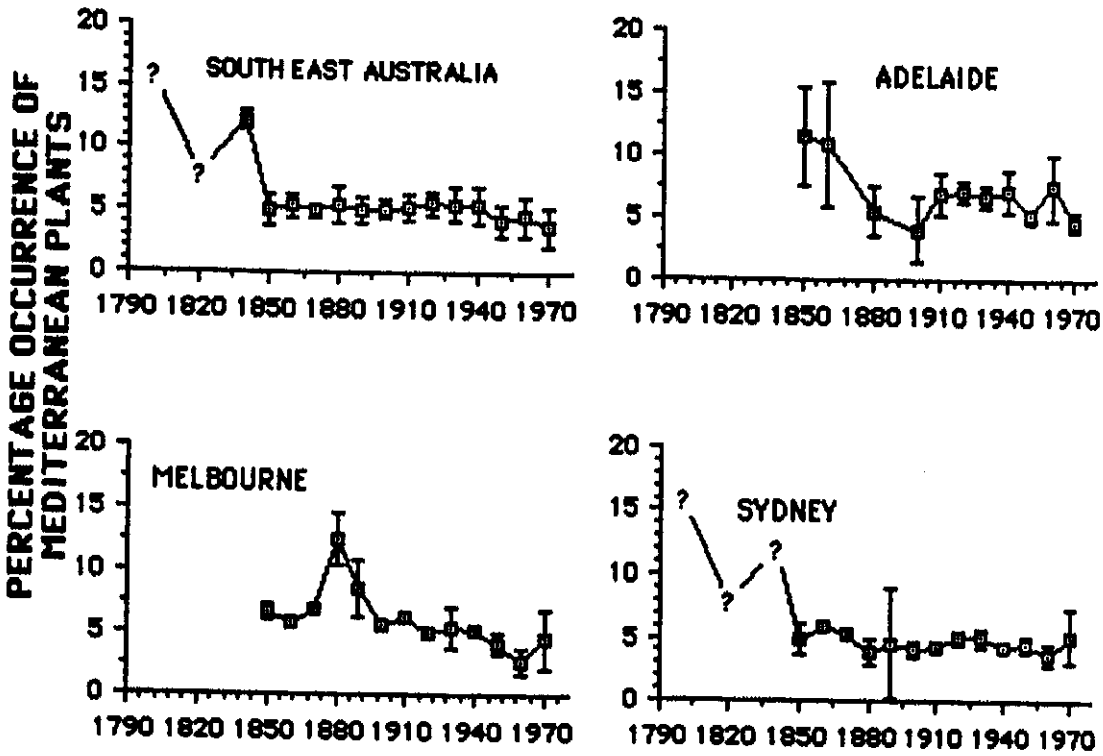
Figure 2.8 THE PROPORTION OF NORTH + CENTRAL EUROPEAN PLANTS LISTED IN NURSERY CATALOGUES



I = STANDARD ERROR OF VARIATION AMONGST CATALOGUES OF THE SAME PERIOD

? = RECORD BASED ON NON-CATALOGUE SOURCES

Figure 2.9 THE PROPORTION OF MEDITERRANEAN PLANTS LISTED IN NURSERY CATALOGUES



two most active people in this field were William Macarthur, of Camden Park, and the colonial secretary, Alexander Mcleay. The fashion in England at that time was to plant foreign plants of unusual form (Polya 1981 p26) and both men reflected this fashion, directly importing seed, bulbs or plants from the Cape of Good Hope, India, China, New Zealand, King Georges Sound (Western Australia), the East Indies, and Rio (Macarthur papers A2943 Stackhouse 1981). The probability of these introductions being successful was increased by the invention of the wardian case in 1829 (Ramsay In preparation). (The wardian case was a large terrarium like structure in which living plants could be transported.)

Both men also obtained seed from English nurseries, such as Loddgies or Veitch and Sons, possibly in part or full exchange for Australian seed, collected by their agents. Due to the fashion for exotica, it is probable that these seeds originated from around the world, and possibly even included Australian species. Kloot (1987) believes that *Sollya heterophylla, Pittosporum undulatum* and *Albizia lophantha,* were almost certainly introduced to South Australia via Great Britain, though they are native to either Western or Eastern Australia. However, a more likely explanation, at least for the *Pittosporum* and *Albizia,* seems to be that these plants were acquired from William Macarthur by Adelaide nurserymen (Macarthur papers A2943 and see appendix 1).

Mcleay and Macarthur were generous in the redistribution of seed and cuttings from their imports, and the range of stock grown in NSW owed much to their efforts. One of the people they gave plants to was Thomas Sheperd, who opened Australia's first private nursery in 1827, at Darlington (now inner Sydney). From 1831 to 1835 Sheperd sold 30,000 fruit trees and 10,000 other trees and shrubs (North 1984). Although many of the fruit trees would have been supplied to orchardists, the proportions sold still stress the emphasis on useful, or economic garden plantings. This emphasis is also highlighted in figure 2.4, and was probably greatest in the humbler gardens of the non-gentry, which may have only consisted of flowers, vegetables, and fruit trees (Crittenden 1979 p17).

Around 1840, Macarthur appears to have decided to enter the nursery trade professionally, for he was soon selling plants to all settled parts of South-

eastern Australia (Macarthur Papers A249). In 1843, 1847, 1850 and 1857, he issued catalogues of his stock, which included at least 700 woody species. The proportions of plants from the different continents were Asia(25%), Europe(20%), North America(15%), South America(10%), Australia(10%), and Africa(8%). Macarthur's stock included a large number of creepers, flowering shrubs, deciduous trees, fruit trees and succulents, and a large number of varieties of *Camellia japonica, Azalea indica, Nerium oleander* and *Rosa indica.*

Macarthur's clients were the gentry and upper middle class (high clergy, leading merchants and large land owners). The more frequently listed types of plants were essential features of the Arcardian Landscape style, which was a popular style dictating large garden plantings, during the time of Macarthur's nursery operations. This style is typified by the house being sited on a hill, surrounded by landscaped grounds with non-native trees and shrubs, and with a gently curving and tree-lined drive leading up to it (Ramsay In preparation).

From Camden, Macarthur supplied plants to the fledgling nurseries of J.J. Rule and Smith and Adamson in Melbourne, and J. Bailey and G. Anstey in Adelaide, while his Sydney clients included Baptist, Sheperds, Fergussons, and Samual Purchase (Adelaide Observer 3rd. May 1845, Macarthur Papers A2949 1846- 1847). Several of the managers or workers of these nurseries, such as George Brunning, Thomas McMillan, Joseph Harris (Melbourne), and George McEwin (Adelaide), became Nursery owners in their own right (Polya 1981 p75, Swinbourne 1980 chap. 1). It is therefore not surprising, that many of the early Australian nurseries had a stock list similar to Macarthur's. Of course, other nurserymen beside Macarthur imported seed and plants. However, the following extract from The Farm and Garden (November 10 1859 p.89), provides an explanation why Macarthur's stock would have been preferred, to the stock of more distant nurseries, and why his influence seems to have been so widespread.

> " *Mr. Charles Giles of Grove Hill* [Adelaide] *had on board the City of Boston, lately arrived from Liverpool, seven glass cases of choice plants, carefully selected and packed in England. They were placed on deck in the usual manner, and in consequence of bad weather they were so much damaged that six of them were thrown overboard, during the voyage, and the seventh was very much injured by salt*

> *water....a case of deciduous plants in the hold of the vessel... also sustained damage by salt water. The entire value of the packages... was upwards of (seventy English pounds).. They were uninsured."*
> The Farm and Garden (November 10 1859 p.89)

There was one notable exception, to the similarity of stock sold by the nurseries of the 1850s, and that was in the sale of Australian plants. Two Sydney nurseries, that of T. W. Sheperd (Thomas's grandson) and Michael Guilfoyle, had native species as 40% of their total stock, and the majority of these plants were species local to the Sydney area. Of the other Sydney nurserymen, for whom records survive, Francis Fergusson lists few native plants, while John Baptist also lists few natives, but states *"That a collection of Native seeds may be had at a few hours notice."* People who requested these native seeds, however, may have done so with the intention of sending them overseas as presents, rather than of planting them in their gardens. Fergusson was a tenant of Macarthur, at Camden, so it is perhaps to be expected that his stock list would be most like that of Macarthur.

Daniel Bunce of Melbourne (for which no catalogue record exists) was an admirer of species local to the Melbourne region, and it is likely that he sold a number of them, while F. C. Davis, of Adelaide did advertise that he had "upwards of 200 varieties of indigenous seeds" for sale. They are exceptions however, and it seems that contemporary nurseries in the other capital cities seem not to have shown the same amount of interest in local Australian species as did those in Sydney (see figures 2.10-2.11). It is important to note that this has remained so ever since (figure 2.11).

A possible explanation for Sydney's native plantings having been predominantly from local species is that the area has a much more diverse local flora than the other cities, and thus a greater choice of species suitable for horticulture.

Another possibility is that it may just be a continuation of habit, begun by the early nurseries, which because of their early establishment and the difficulties associated with importing plants, had stock shortages, which they rectified by collecting seed or seedlings from the local bush. One would imagine that plants collected in this way, could be sold at "*strictly moderate*" prices (Guilfoyle 1851), and perhaps were most attractive to people of lesser

Figure 2.10 THE PROPORTION OF AUSTRALIAN NATIVE PLANTS LISTED IN NURSERY CATALOGUES

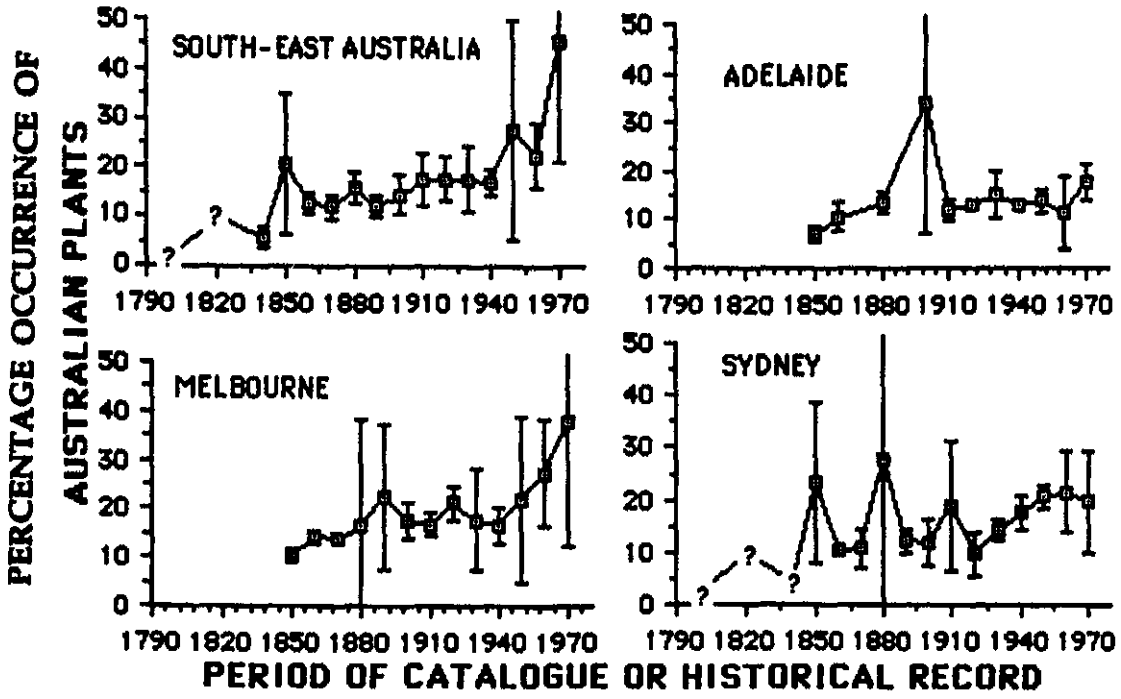
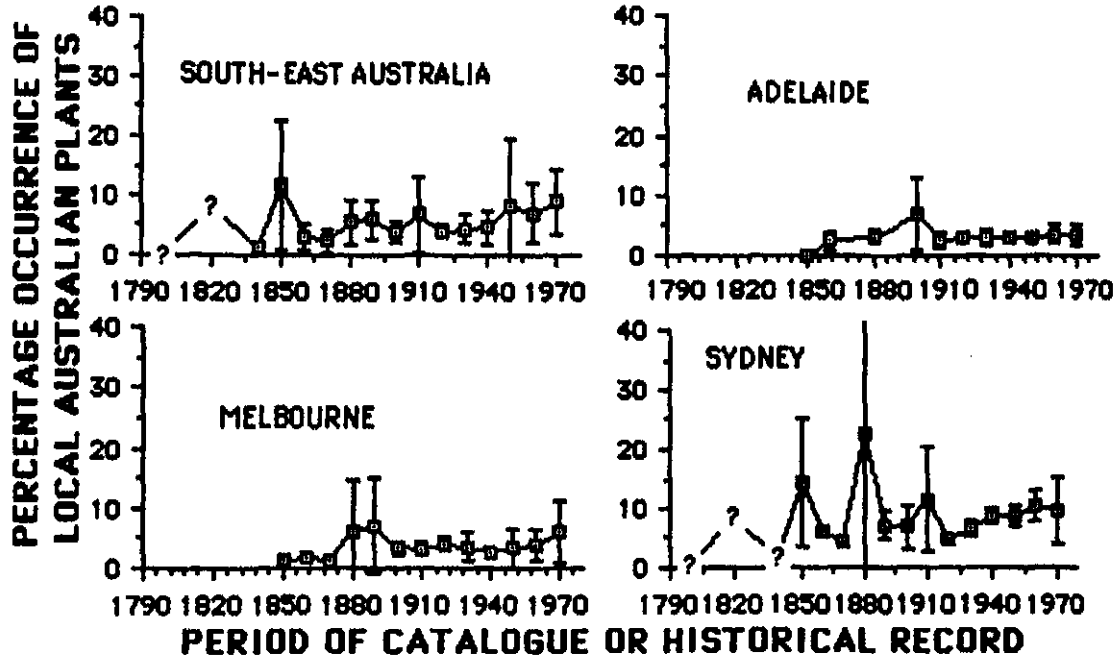


FIGURE 2.11 THE PROPORTION OF LOCAL AUSTRALIAN PLANTS LISTED IN NURSERY CATALOGUES



I = STANDARD ERROR OF VARIATION AMONGST CATALOGUES OF THE SAME PERIOD

? = RECORD BASED ON NON-CATALOGUE SOURCES

means. In this context, it is interesting to note that Macarthur, catering for the wealthy, carried relatively few local plants, and that Adelaide nurseries, situated in a free settlement, with probably a much greater average wealth than Sydney, also carried few local plants amongst their stock. However, the standard error bars on figures 2.4 to 2.18, illustrate much variation amongst the stock of the nurseries of a particular period.

Another interesting feature of the catalogues of Sheperd and Guilfoyle are that many of the Australian natives they list do not re-appear in catalogues again till the 1910s (Acacias) or the 1940s (Banksias, Callistemons, Hakeas and Grevilleas). The plants involved nearly all have grey green foliage and linear leaves. To a lesser extent this is also a feature of the early Melbourne nurseries of Rule and Handasyde, McMillan and Co., but is not reflected in the Adelaide listings.

1850- 1890. The Victorian Era

South-eastern Australia's wealth and population rose markedly following the gold finds of the 1850s. Rising wool prices, and a developing manufacturing industry, continued this prosperity into the 1870s (Serle 1971). Increased wealth and an influx of workers, allowed shorter working hours to be sought and granted. Thus there were more people with more money and more time to spend on gardening, though it has been argued that the majority of gardens, belonging to Melbourne's working class, remained bare throughout the 1880s (Serle 1971 p52). Those who did decide to plant were, however, no longer restricted by the need for self sufficiency, or limited availability of stock. They could plant what they liked, and that seems to have been dictated by English style and taste (Australian Gallery Directors Council 1979 p29, Tanner 1976, Crittenden 1986 Chapter 4). In England the "gardenesque" style was in vogue, which meant that gardens contained the greatest possible variety, in which foliage and plant forms were contrasted to form a sense of exotic places and mystery. (Kerr and Falkus 1982, Cuffley 1983). Glasshouses and ferneries were popular in larger gardens. Much use was also made of flowering shrubs, planted along winding paths, and of specimen trees, planted in such a way *"that each turn presents new attractions"* (Heyne 1877). The stock held by Australian nurseries underwent dramatic changes in response to the adoption of gardenesque fashion. The rise in popularity of woody ferns (figure 2.12),

FIGURE 2.12 THE PROPORTION OF WOODY FERNS LISTED IN NURSERY CATALOGUES

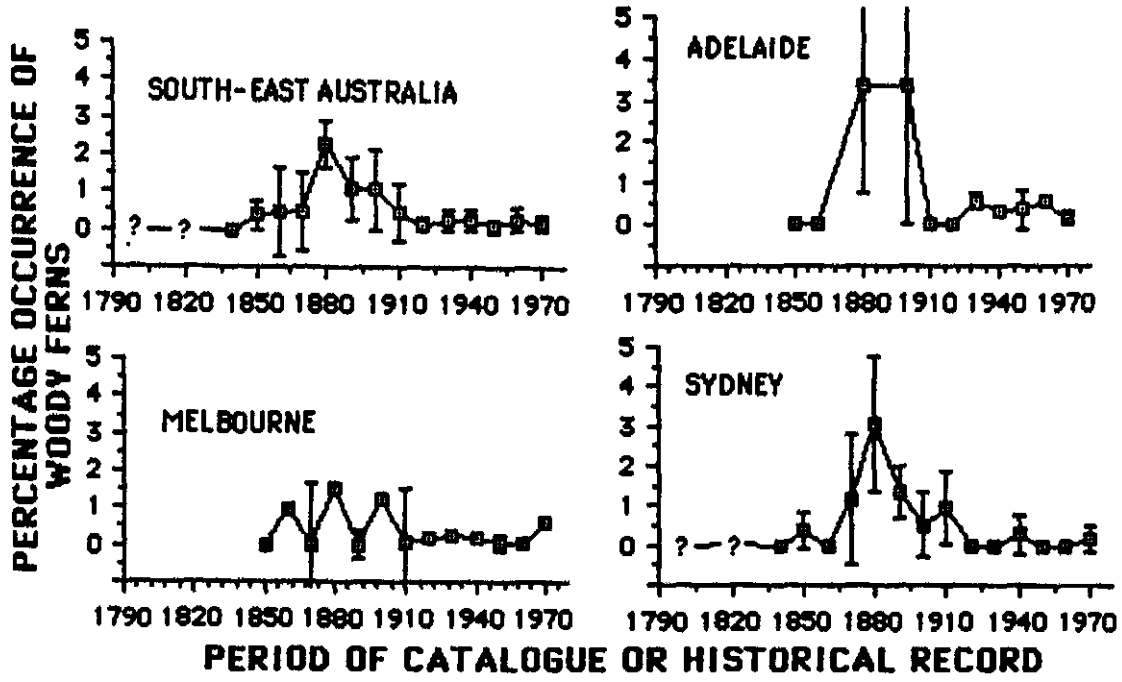
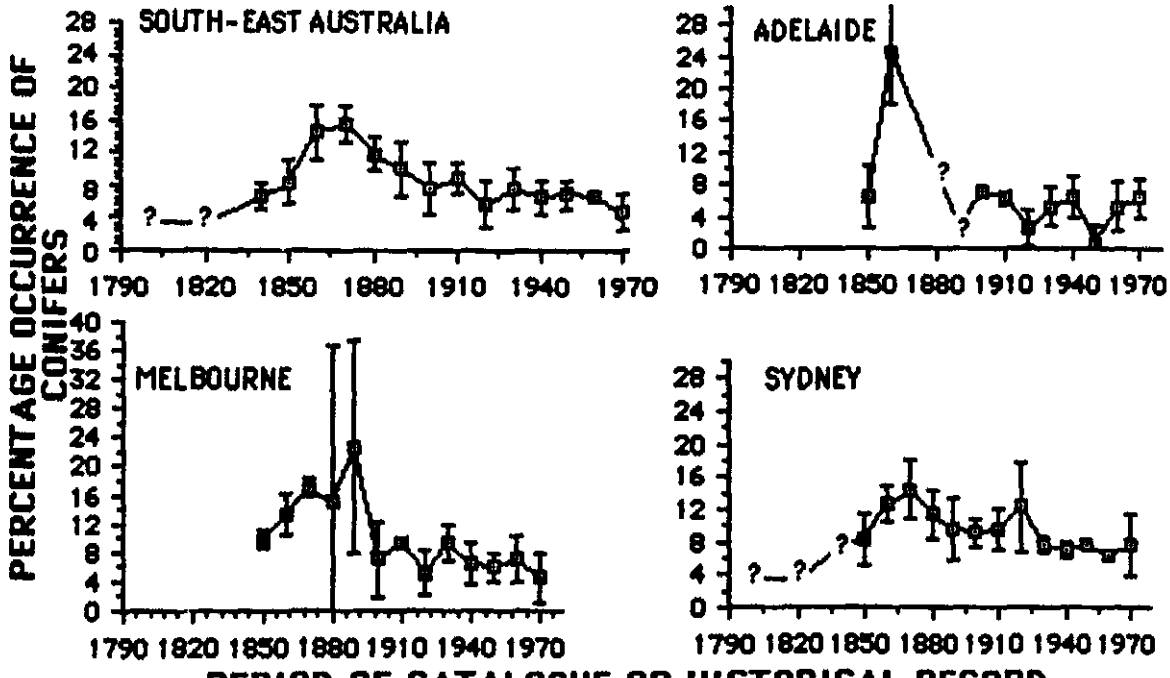


FIGURE 2.13 THE PROPORTION OF CONIFERS LISTED IN NURSERY CATALOGES



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conifers (figure 2.13) and architectural or specimen plants (palms, bamboos, cycads, Agavaceae) (figure 2.14), is particularly evident. Many genera belonging to these groups, such as *Agathis, Alsophila,* or *Royena* were only listed in the Catalogues of the Victorian era. It is interesting to note that none of these briefly listed species has become invasive in the bushland of Sydney, Adelaide or Melbourne.

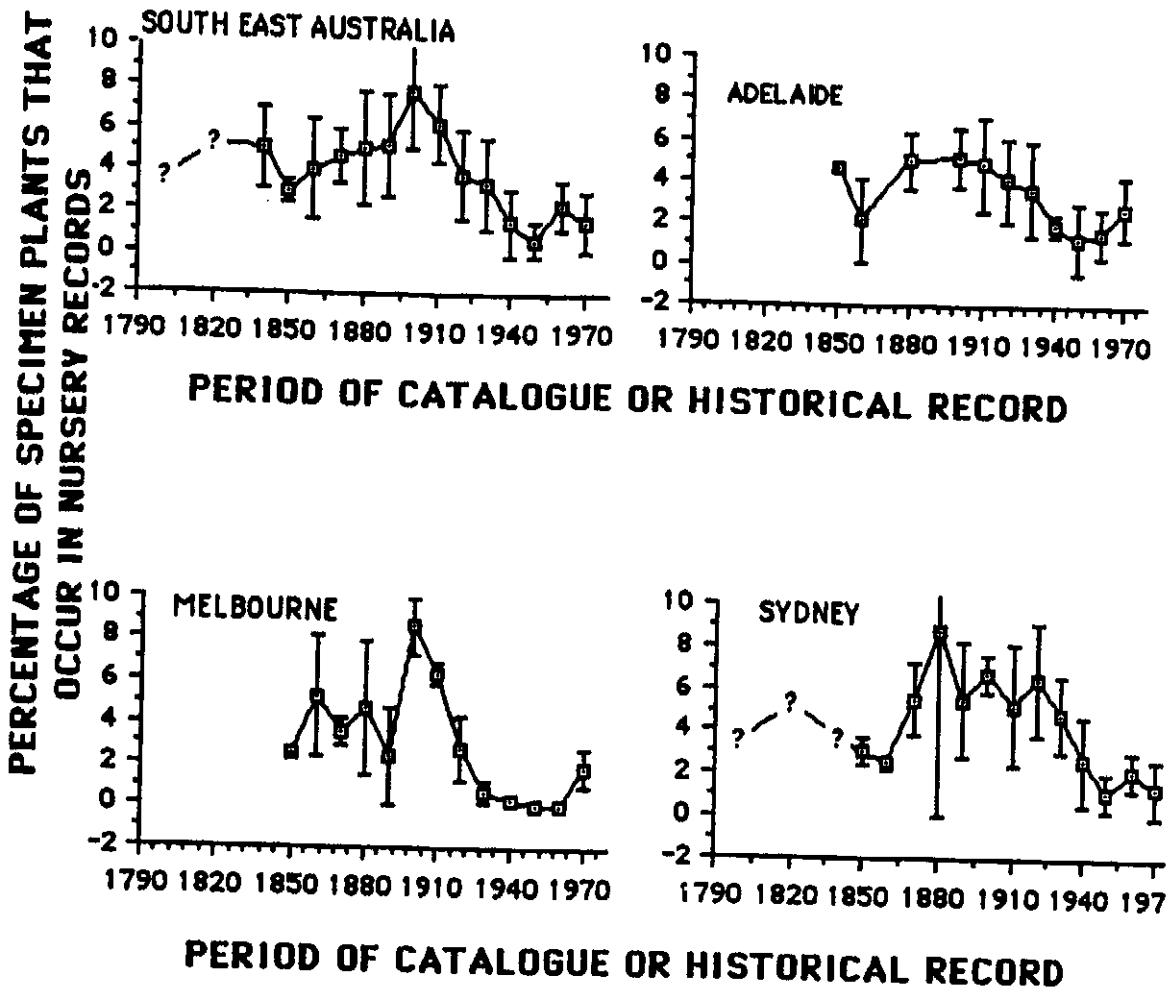
Around 12% of stock carried were Australian species (figure 2.10). The most widely sold were of dark green foliage with a symmetrical form that fitted best into the English gardenesque style, and included such plants as *Pittosporum undulatum, Grevillea robusta, Brachychiton populneus* and *Lagunaria patersonii.* These type of Australian native have always been frequent listings and are amongst those species that have been most listed, over the longest time, in South-eastern Australian nursery catalogues (see appendices 1 - 3).

1890-1920 The Federation garden

The turn of the century saw a change from the gardenesque to the federation style. Federation gardens maintained many of the attributes of the preceding style, with large variety and groupings of trees, shrubs, and flowers, but gone were the contrasting foliage, sense of exotic and single specimen plantings. Consequently the variety of ferns and conifers sold dropped markedly, though palms remained popular. A sense of enclosure was a feature of the new style so hedges and creeper covered fences became common. (Fraser and Joyce 1986 p68). In addition, planting was brought up to the frame of the house, with much use being made of flowering shrubs such as *Hydrangea, Bouvardia, Camellia, Daphne, Hibiscus, Rosa* and azalea (Kelly 1982 and see appendices 1-3). Evergreen trees such as *Acmena smithii, Ailanthus altissima, Illicium anisatum, Jacaranda mimosifolia* and *Schinus molle* were also popular plantings (Ramsay in preparation and see appendices 1-3).

Plant collecting trips to China during this period resulted in an increased use of Chinese plants (see figure 2.15), with many newly described Chinese plants, such as *Pyracantha angustifolia* and *Cotoneaster glaucophyllus* being brought into cultivation for the first time beyond China's borders.

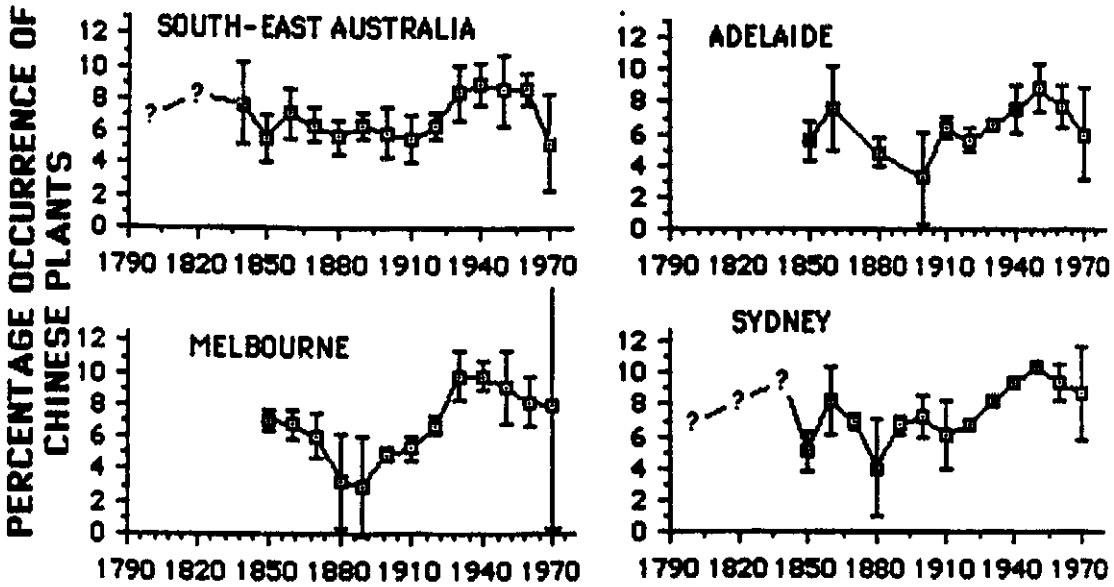
FIGURE 2.14 THE PROPORTION OF SPECIMEN PLANTS LISTED IN NURSERY CATALOGUES



I = STANDARD ERROR OF VARIATION AMONGST CATALOGUES OF THE SAME PERIOD

? = RECORD BASE ON NON-CATALOGUE SOURCES

FIGURE 2.15 THE PROPORTION OF CHINESE PLANTS LISTED IN NURSERY CATALOGUES



= STANDARD ERROR OF VARIATION AMONGST CATALOGUES OF THE SAME PERIOD

? = RECORD BASED ON NON-CATALOGUE SOURCES

Political federation aroused a sense of nationalism, and with it an increased interest in Australian plants. The numbers of native species, listed by individual nurseries, varied considerably, and this is explained by the fact, that during this period, native plants were usually sold as seed, rather than potted stock. Thus nurseries, such as Anderson and Co., Yates (Sydney), Law Somner and Co. (Melbourne) and Hacketts (Adelaide), which traded extensively in seeds, tended to sell a greater proportion of Australian species than non-seed traders. Acacias and Eucalypts dominated all seed listings, probably because they are both genera with a large variety of species and they produce large numbers of seed that are relatively easy to collect. Possibly their popularity was further inc~eased because they were seen as typically Australian species.

The Interwar domestic gardens 1920 - 1940.

The type of species planted between the two world wars changed little from the preceding plantings, the exception being that the rose came to dominate catalogue listings. The increased popularity of the rose may have been due partly to the production of new hybrids and varieties, from crosses between European and fairly recently acquired Asian species, and partly to the memories of English Gardens, fresh in the minds of many returning servicemen for whom the rose was the symbol of England (Crittenden 1986 p126).

The recent decades 1940 - 1980.

In 1940, Fergusson and son, of Sydney, became the first nursery (of those studied) to list potted stock of Australian trees and shrubs separately in their catalogues, noting that *"Many of our customers are becoming native plant conscious."* This heralded a trend that became widespread in the 1960s. By the 1970s around a quarter of all stock listed, in the catalogues studied, were native species, though there was much variation between individual nurseries(see figure 2.10). This resurgence of native planting is mainly at the expense of species from the Americas and Asia (see figures 2.5, 2.10, 2.16, 2.17). Native species with needle like, fine textured and grey foliage, became popular plantings.

FIGURE 2.16 THE PROPORTION OF NORTH AMERICAN PLANTS LISTED IN NURSERY CATALOGUES

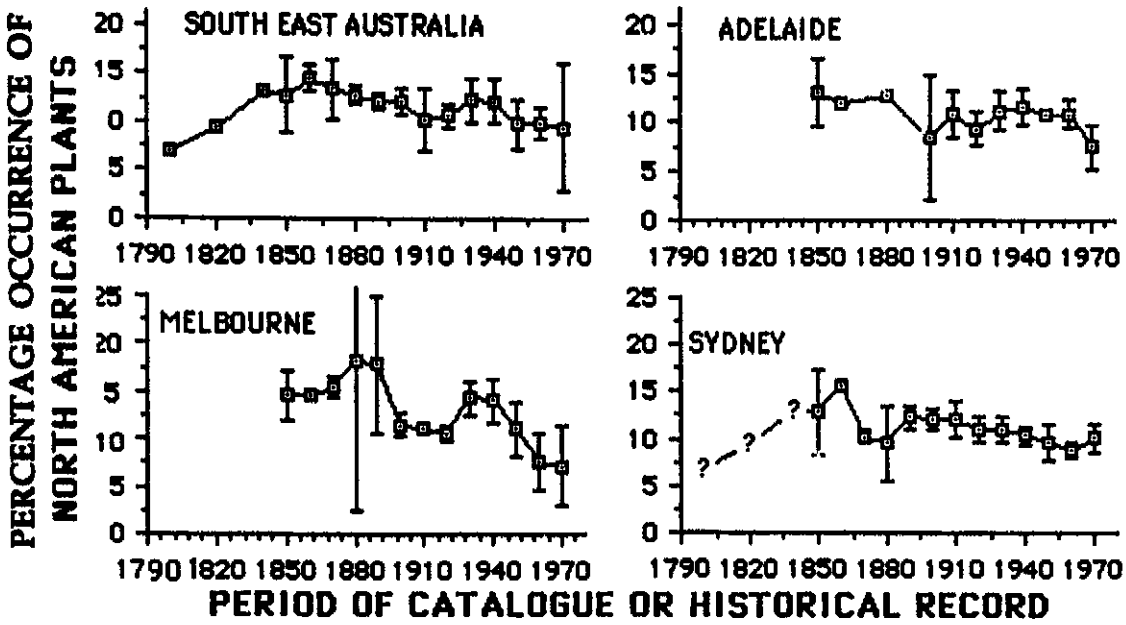
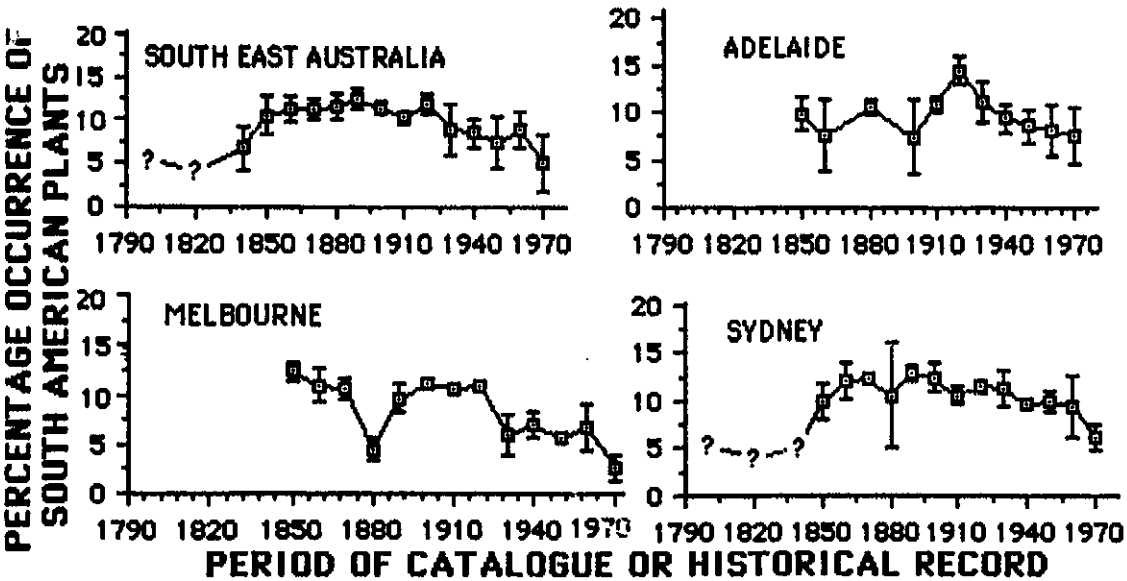


FIGURE 2.17 THE PROPORTION OF SOUTH AMERICAN PLANTS LISTED IN NURSERY CATALOGUES



I = STANDARD ERROR OF VARIATION AMONGST CATALOGUES OF THE SAME PERIOD

? = RECORD BASED ON NON-CATALOGUE SOURCES

A feature of recent catalogues is the relatively large proportion (6%) of plants that are garden hybrids (figure 2.18). This peak follows a steady increase over time of the proportion of such plants grown. The majority of garden hybrids listed in recent catalogues are from Australian natives, notably from the genus *Grevillea*.

2.5 Conclusions from Nursery catalogue record

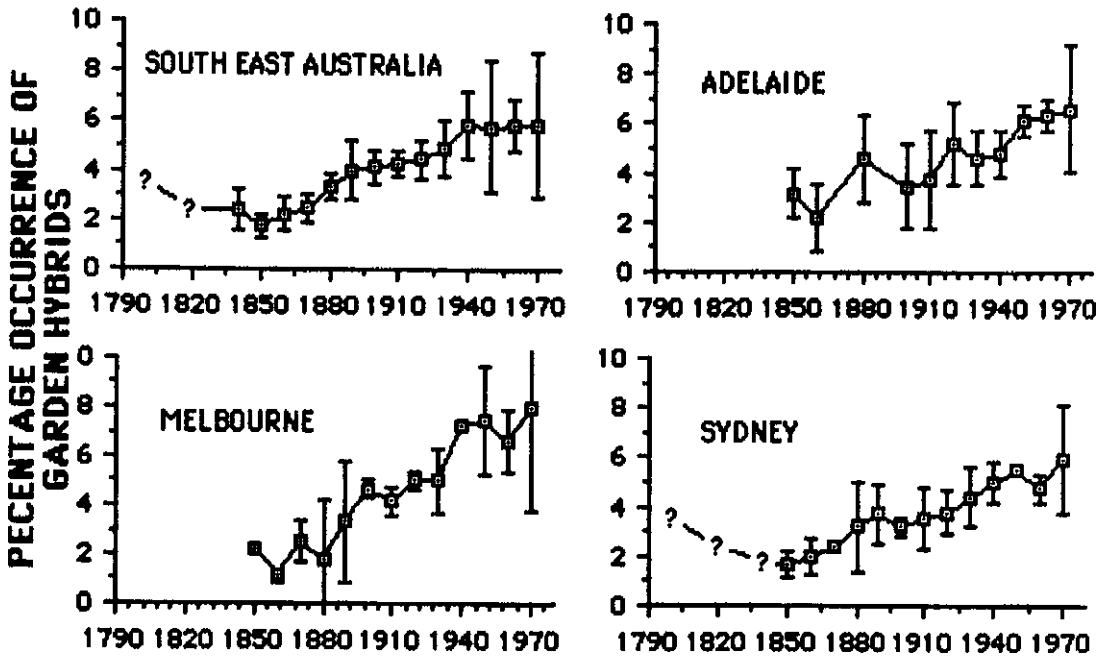
The study of nursery catalogues, has provided an extensive record of which species have been planted in South-eastern Australia. In addition, it indicates the popularity and timespan of a species plantings.

The type of stock listed in nurseries has changed over time according to availability of plant material, fashion, horticultural developments and economic status. These variations, amongst the catalogues studied, were usually not drastic, with differences between nurseries of the same decade, frequently as great as those between nurseries of varying decades. However, there are several recognisable trends, which determine the popular and long-lasting plantings.

Those species with the greatest number of catalogue listings are those that were least effected by changes in transport, economic status and fashion. Species that fall into this category include many Australian natives, fruit trees and flowering shrubs with dark green foliage. Species that were listed in 70% or more of all the catalogues studied for either Adelaide, Melbourne or Sydney are *Arbutus unedo, Aucuba japonica, Berberis vulgaris, Boronia megastigma, Brachychiton acerifolium, Buxus sempervirens, Cedrus deodara, Cinnamomum camphora, Cupressus macrocarpa, Daphne odora, Gardenia jasminoides, Grevillea robusta, Hakea laurina, Hedera helix, Hydrangea macrophylla, Ilex aquifolium, Lagunaria patersonii, Michelia figo, Nerium oleander, Passiflora edulis, Pittosporum eugenioides, Pittosporum undulatum., Prunus cerasifera, Prunus lusitanica, Prunus persica, Punica granatum, Syringa vulgaris, Viburnum opulus, Viburnum tinus, Vitis vinifera* and *Wisteria sinensis.*

Inter city differences in the type of stock carried were small. Sydney catalogues, however, consistently list more local species than those of Adelaide or Melbourne; they also list more Asian and South American

FIGURE 2.18 THE PROPORTION OF GARDEN HYBRID PLANTS LISTED IN NURSEY CATALOGUES



I = STANDARD ERROR OF VARIATION AMONGST CATALOGUES OF THE SAME PERIOD

? = RECORD BASED ON NON-CATALOGUE SOURCES

plants, than those of Adelaide and Melbourne, which list greater numbers of Mediterranean and South African plants. These differences are probably related to variations in climatic suitability.

2.6 The history of ornamental tree and shrub planting in the Canberra region.

Canberra's plantings have seen it transformed from an almost treeless plain (Throsby 1820, in Cambage 1921), to a garden city of over twelve million trees (Anon 1980). Most of this planting has been performed by government bodies. Although much of this record has been lost or destroyed, enough remains to give a good resume of woody planting in Canberra, a record not hampered by the problems inherent in the catalogue documented histories of planting in Adelaide, Sydney or Melbourne.

A major reason why Canberra's record is so good, is that, unlike the other cities, it did not become a large settlement until about 1920, shortly after it was declared the capital city of Australia. Some woody species had been planted in the Canberra region, however, as long as ninety years before this date, though the extent of planting before 1920 was insignificant in comparison to that which followed. It is likely, however, that species which have been planted over a long time scale, even in small numbers, will have had greater opportunities to spread, than more recent plantings. It is therefore necessary to examine the planting activity that occurred before Canberra became a Government town.

The first years 1830 - 1840

The area which became known as Canberra was first settled in the 1830s. Most of the land owners were absentees represented by overseers and convict servants (Fitzhardine 1983). Undoubtedly these absent landholders placed more priority on their workers establishing dwellings and cultivated fields and on improving pastures, than on developing gardens, while the workers themselves would have had little time or inclination for doing so, and their remoteness would have made it difficult to acquire planting stock. Thus any ornamental planting was of a rudimentary nature. Gardens were for survival, and the predominant trees and shrubs would have been fruit and nut trees, such as apple, pear, quince, almond, peach, plum, walnut, and grape vine, which were being sold and widely grown in Sydney at this

time (Jamison 1829, Sydney Gazette and N.S.W. Advertiser 21. July. 1825, Sydney Herald 4. July 1831).

Consolidation 1840 - 1860.

As more landholders settled on properties from the late 1830s and throughout the 1840s, it is clear that extensive ornamental plantings were undertaken. As early as 1834 Duntroon, the homestead of Robert Campbell, was described as "a clean romantic little house overhung with vines"(Lhotsky 1834). Terrence Murray, owner of Yarralumla since 1837, wrote in 1843 to his overseer, Stewart M. Mowle, about establishing a garden there, stating "I particularly wish to have a good collection of plants and flowers for our little girl" Mary (Minnie), Murray's wife (Murray Papers 565/28). An 1846 drawing of Woden homestead, owned by Terrence's brother, Dr. J.F. Murray, shows a garden of elaborate circular paths and flower beds highlighted by shrub planting, while vines, or possibly climbing roses, festoon the veranda. This type of garden with no lawn to water or cut, and in which flowers took pride of place, usually alongside vegetables, herbs and fruits is known as the colonial cottage garden, and was common around the smaller dwellings of 19th Century New South Wales (Crittenden 1979 p17-18).

Direct evidence of exactly which species of trees and shrubs were used in these plantings is scarce. Murray's letters to Mowle mention grapevines, fuschias, willows and acacias (Murray papers 565/28, 565/82). Mary, Mowle's wife, noted in her diary (1850-1853) that she gathered apples. The diary of William Bunn, nephew of T. and J. Murray, records that he obtained grapes from Mr. Campbell, cherries from MacQuoid (Tuggeranong) and some apples from Mrs. Mowle. It appears that fruit trees and orchards continued to be key plantings. Canberra's isolation from markets would have made some degree of self sufficiency essential.

The letters of Terrence Murray indicate that many of the trees and shrubs planted at Yarralumla were obtained from other land holders, and this probably is indicative of a general exchange of plants between landholders at this time. In writing to Mowle he commented, *"I shall write to Frank Rossi* [of Goulburn] *to let you have some plants* ..... [and] *Dr Wilson* [of Braidwood] *promised me a load of shrubs and cuttings*" (Murray papers 565/56), and at a later date, *"Minnie mentioned to me that our stock of trees*

is exhausted...As Packer [of Gunderoo] *has a good garden I enclose a note which you can send to him..... he could I dare say give us some willows and Acacias*"(ibid 56/28). The acacias mentioned were probably the false acacia *Robinia pseudoacacia.*

Murray was a frequent purchaser of plants, however, placing at least thirteen orders with William Macarthur of Camden from 1844 to 1857, though only an 1844 order specifically gives Yarralumla as Murray's address. As mentioned earlier (see 2.4(b)), Macarthur was Australia's most active nurseryman during this period, and his clients included Frank Rossi, Hugh Gordon of Bungendore, and R. Campbell (address not given), together with fifteen residents of Goulburn, twelve in the Yass district, and three from Gundagai (Macarthur papers A2949, A4231). An indication of the types of plants, growing around the shacks and homesteads of early Canberra, therefore may be gained from the list of species occurring in Macarthur's catalogues (shown in appendix 1).

1860-1890 Sydney suppliers and local landowners

In 1860, the regions first newspaper, the Golden Age (later the Queanbeyan Age), was printed. Comments in the gardening section, often written by the publisher, John Gale, provide some indication of plants being grown at this time. In the 30 July 1863 edition, for instance, Gale advises that it is time to "*plant camellias, azaleas, roses.....bananas, apple, pear, quince, peach, orange, lime, pomegranate, gooseberry, currant and raspberry.....prune geraniums,* [and] *repot fuschias.*" The inclusion of bananas seems to suggest that in 1860 Gale was a novice local gardener, as bananas are frost sensitive and not suited to the area. It is also a warning that a listing in a local newspaper does not necessarily equate with that species being locally planted.

The early editions of the Queanbeyan Age also carried advertisements during the planting season (March-September) for regional farmers, offering trees and shrubs for sale. Their stock consisted of apples, pears, plums, cherries, apricots, peaches, quinces, walnuts, blackberries, and hawthorn.

E.M. Ward of Ginninderra was a consistent advertiser throughout the 1870s and into the early 1880s. To Ward belongs the title of being the region's first

nurseryman. He not only offered a large variety of fruit trees but also sold English oaks, elms, laburnum trees, and "*a few sorts of choice pines and evergreen shrubs*." As he advertised a special rate of 5 shillings per 100 plants, his stock may have been extensive.

Ward always began his advertisements with '*Buy your fruit trees off E.M. Ward in preference to trees raised in a warmer latitude.....*' which suggests that his major competition was not local, and indeed the most frequent advertisers in the Age were four Sydney based companies. They were John Baptist and Son, F.Fergusson and Son, Anderson Hall and Co, and Samuel Purchase. The stock listed in the mail-order catalogues they produced is shown in appendix 1. As discussed earlier, they sold a large variety of ferns, palms, conifers and flowering shrubs.

The first photographer visited the Canberra district in 1855. Surviving photographs, chiefly those of Henry Beaufoy Merlin (1870) and Charles Kerry (1890) indicate that *Salix babylonica* (weeping willow), *Populus nigra* (lombardy popular), *Vitis vinifera* (grape), *Hedera helix* (ivy), *Cupressus sempervirens*, *Quercus robur* (English oak), *Pinus raduata* and *Ulmus procera* (English elm) were already well established by 1890 (Lea-Scarlett and Robison 1986).

1890-1920 Goulburn gardeners and public planting.

There are only a few editions of the Queanbeyan Age, surviving from 1890 to 1899, but it is probable that during this period, Ward's nursery went out of business, as he died in 1903 aged 77 (Canberra Historical Society Bibliographic Records). None of his advertisements, or those of a possible successor appear in the Queanbeyan Observer from 1898 to 1900, or in the post 1900 Queanbeyan Age. Neither were advertisements placed by the four Sydney based nurseries, so their local activity may have declined. In their place, there are frequent advertisements by two Goulburn nurseries and another Sydney company P.L.C. Sheperd and Son. Sheperd's advertisements indicate that he was most active around the turn of the century. Before 1900, advertisements, emphasized their large variety of trees and shrubs and availability of catalogues, while those after 1901 emphasize specialty lines of bulbs, fruit trees, potatoes and vegetable seeds. Several local landowners infrequently advertised, but only small quantities of fruit trees.

It appears then, that the Goulburn nurseries were the major supplier of plants from around the turn of the century. These nurseries were the Goulburn Seed and Nursery Company and that of A. Landsdowne & Sons, Seedsman and Plant Merchants. A. Landsdowne also wrote the gardening section of the Queanbeyan Age from 1900 to 1917, when his son took over that duty. He so concentrated on the seeds side of his business, that A.Goodhew, the manager of the Goulburn Seed and Nursery Company, was able to advertise in the Queanbeyan Age of August 1910, that "*We are the only nurseryman in Goulburn*". Australian seed merchants of this time sold a large diversity of woody creepers and Australian plants. It has been suggested that, during the federation period, a gardening manual produced by Yates, a Sydney Seed Company, so influenced the advice market that shrub and tree planting was almost banished from Sydney suburban gardens, in favour of seed planting (Crittenden 1986 p 92). Landsdowne, with his column in the Queanbeyan Age was in a position to exploit any trend toward seed dominance. In 1915 Lansdowne moved more into the nursery trade, offering for sale ornamental trees, shrubs, roses, hedge plants, asparagus and rhubarb.

The Goulburn Seed and Nursery Company carried an extensive stock, similar in many ways to that of the Sydney companies that preceded it. Goodhew did state, however, that he only supplied cool climate, frost resistant plants, including many conifers and a "*fine lot of elms, ash, birch, poplar and Rowans*"(Goodhew 1912 in Murphy G.P. 1963 appendix 1). A 1912 catalogue listing of the Goulburn Seed and Nursery Company was used as the major guide to the stock sold in Canberra during this period.

In 1909, Canberra was selected as the site for the national capital. The extent of tree and shrub planting that had been carried out before this date is best described by quoting the Canberra Times June 21 1927 "*The early settlers dotted the plain country with small plantations.....of exotic trees, such as pine, elm, oak, locust(Robinia pseudoacacia) and hawthorn planted mainly around the old homesteads and as copses in their paddocks.*" Mr. T.C.G. Weston was placed in charge of the task of raising and transplanting the species that would transform the sparse plain into a garden city. Together with Canberra's designer, Walter Burley Griffin, he made the decisions concerning species planting.

Weston's first action was to establish a nursery and an experimental site on which a large number of plants could be tested for suitability in Canberra's climate. His actions required the importation of hundreds of plants from nurseries in Sydney, rural N.S.W., Melbourne, Ballarat, and New Zealand, in addition to Goulburn. The list of species imported, how successful and numerous their subsequent plantings were, and how widely they were eventually planted, is well documented, for the period of 1912-1924. The records are contained in the nursery files of inwards and outwards correspondence, and in the diaries and notes of Weston. These documents are Department of Interior files, and are housed at the Australian Archives, under the file number CA764. (For a detailed list of documents see the listing of non-published references in the bibliography).

After an establishment phase of a few years, Weston embarked on an extensive afforestation of the hills surrounding Canberra, using several hundred thousand plants of *Pinus radiata, Acacia decurrens, Cedrus deodara, Cedrus atlantica, Cupressus sempervirens, Eucalyptus cinerea, Eucalyptus pulverulenta, Eucalyptus hemiphloia, Callistemon citrinus, Brachychiton populneus, and Sequoia sempervirens* (Murphy 1963, appendix 6). *Pinus radiata* was by far the most common early planting, and it accounted for over 80% of all the North American plantings shown on figure 2.21.

The afforestation plantings alone ensured that over the eight years from 1912 to 1920, there were many more plantings of trees and shrubs than had occurred over the previous eighty years.

In addition to afforestation, by 1920, Weston and his staff had planted 15,000 trees and shrubs within the city area. Forty thousand plants were distributed also to land holders within the territory. The large number of plants issued by the nursery suggests that after about 1915 the supply of plants by Goulburn nurseries into the Canberra region, must have waned considerably.

Figure 2.19. THE PERCENTAGE OF SPECIES PLANTED IN CANBERRA, ACCORDING TO GEOGRAPHIC ORIGIN AND PERIOD OF PLANTING

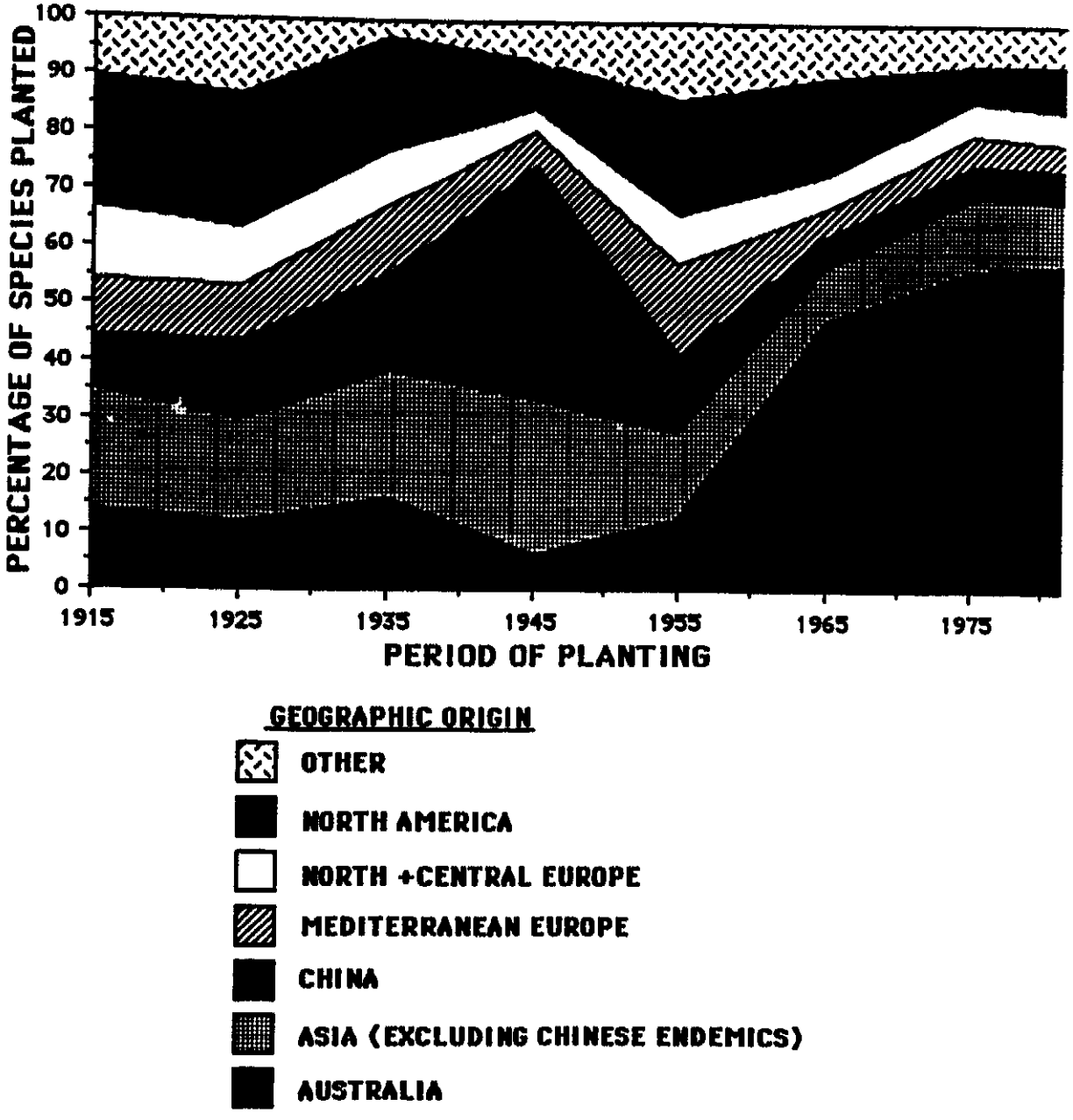


Figure 2.20 THE PERCENTAGE OF THE TOTAL NUMBER OF PLANTINGS IN CANBERRA, ACCORDING TO GEOGRAPHIC ORIGIN AND PERIOD OF PLANTING

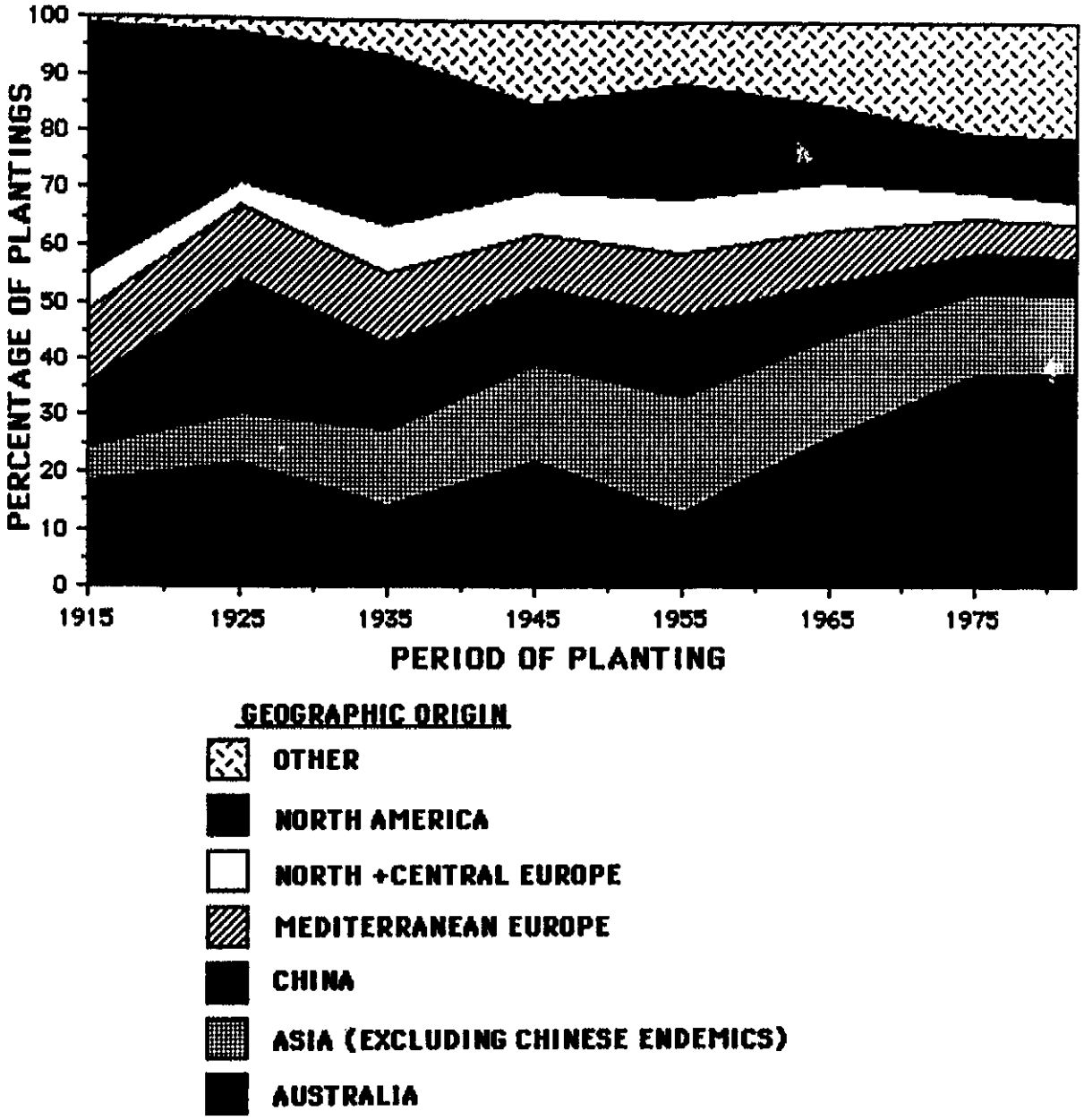


Figure 2.21 THE PERCENTAGE OF CONIFER SPECIES AMONGST ALL SPECIES PLANTINGS IN CANBERRA

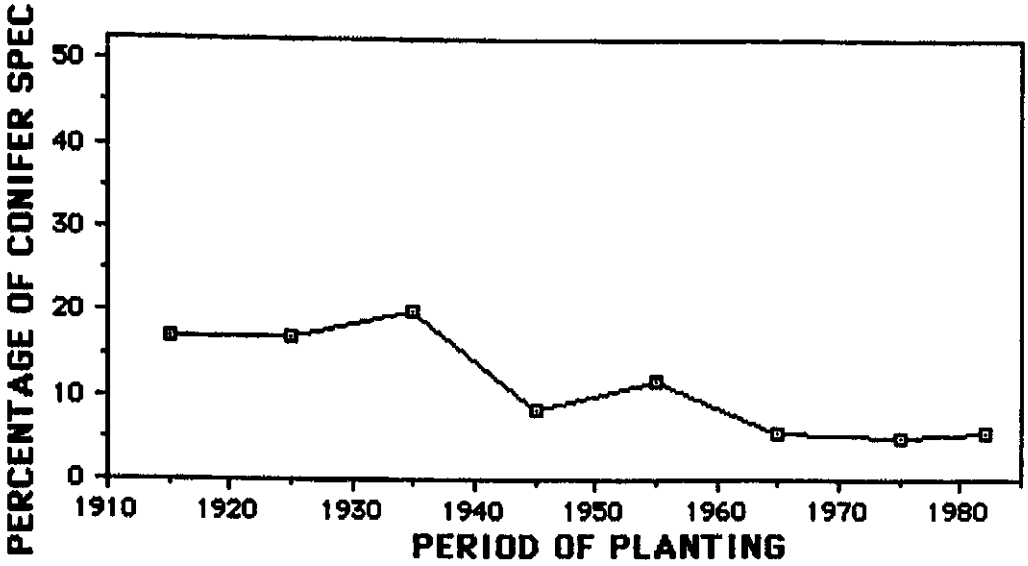
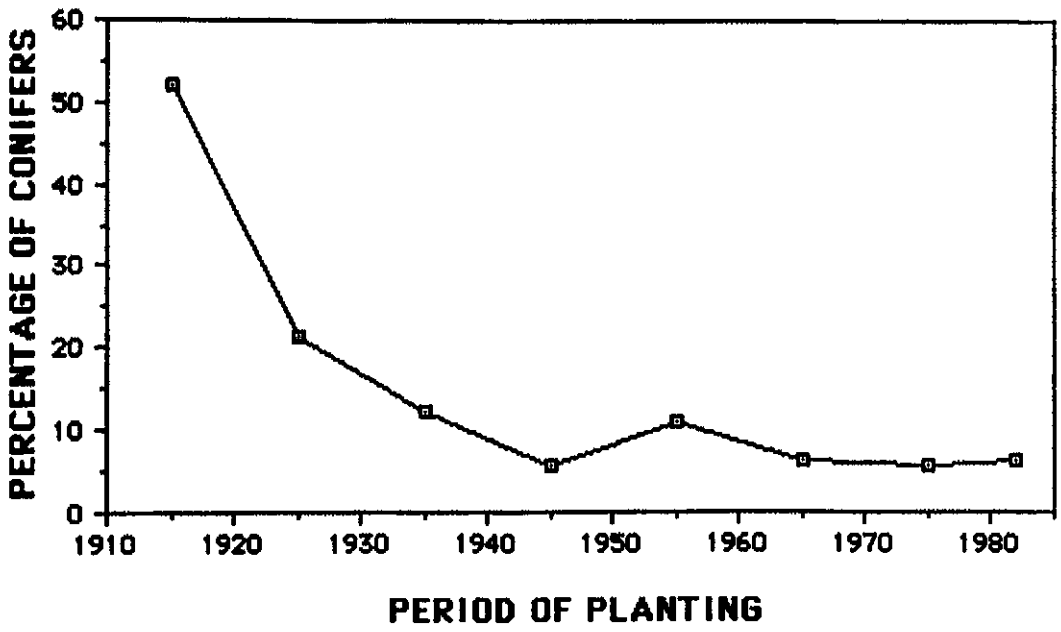


Figure 2.22 THE PERCENTAGE OF CONIFERS AMONGST TOTAL PLANTINGS IN CANBERRA



In deciding which species to adorn the capital, Weston followed the results of his experimental nursery, rather than the dictates of federation fashion. Those species he favoured such as *Celtis australis, Photinia serrulata,* and *Cupressus sempervirens,* originated from areas like mid-southern Europe, mild Asia-minor, mid-southern United States and China, which have comparable climates to that of Canberra (see figure 5.9). Only a fraction of one percentage of all species plantings had a climatically unmatched South American origin, compared to percentages of five to ten percent in the other capital cities (figure 2.17)

Walter Burley Griffin was a keen advocate of native plantings, and it is probably his influence that led to their trial and largescale use by Weston, though the proportion of Australian species planted to non-native species was similar to the proportions listed in the nursery catalogues of the other capital cities at this time. (figs 2.10). The influence of Burley Griffin (an American) also may be behind the large proportion (23%) of North American species planted. Certainly, he pushed the establishment of largely unsuccessful Redwood groves *(Sequoia sempervirens).*

The use of conifers in the afforestation work, and because many of the more ornamental conifers have a North American origin, are probable explanations why conifer planting was at its peak in Canberra during the early years of public planting (figure 2.22).

1920-1945 Streets, shrubs and slow down.

During the 1920s, street, park and building beautification quickly replaced afforestation as the dominant nursery activity. Weston had planted 214 native species in Canberra (see appendix 4), and made use of many of them in the afforestation work. The importance of native species in the new city plantings was dwarfed by that of exotic species. In 1924, the Federal Capital Advisory Committee reported that Weston's experiment with indigenous trees was disappointing (Murphy 1979 p.38), and this, together with Griffin's departure in 1920, is probably the reason why the proportion of natives planted remained static throughout the 1920- 1945 period.

During this period, thousands of plants from surplus stocks were issued free of charge to lease holders, and at half Sydney and Melbourne rates to free

holders in the Territory (ibid p.40). This free issue of plants was to ensure private as well as public planting.

Weston retired, in 1926, as superintendent of Parks and Gardens, and his place was taken by Alexander Bruce. Bruce continued to plant those species Weston had chosen but with one major difference. Bruce had a passion for the Rose. In 1932 he wrote *"the rose has been selected as the backbone of the floral decorative scheme for the Federal Capital, and.... has rapidly achieved the place of honour in private gardens throughout the Territory."* The love of the rose was not confined to Canberra, but was common throughout Australia at this time. Canberrans also followed the national trend of using hedges and creeper covered fences to mark boundary lines. Hedges were particularly common in Canberra, probably as it was the government's responsibility to maintain and trim all front hedges, and because of a law preventing the erection of front fences in order to enhance the garden city ideal.

The surviving documentation of the planting activity under Bruce's leadership is very patchy, though there are good records for the years 1934 and 1936, under the Australian Archives file numbers CA764 and CA27.

The planting of species with a Chinese origin reached its peak in the 1940s, and similar trends were observed in the other cities. Many of the species planted were either relatively new to horticulture, or were popular hedge plantings.

The government nursery specialised in growing hardy species that could survive with little maintenance. As a consequence, despite the free issue of plants, there was still a market for certain species that could be grown in Canberra provided they were well cared for. From 1926 to 1929 half a dozen Sydney and Melbourne firms advertised in the Canberra Times the sale of specialist lines such as roses, bulbs or fruit trees. These advertisements stopped with the onset of the depression. In 1932, F.Warren, of Cooma road Queanbeyan, first advertised the sale of fruit trees, roses and shrubs, including, apples, apricots, almonds, cherries, peaches, pears, plums, quinces, figs, mulberries and a 100 varieties of roses. Warren's advertisements ceased in 1936. In 1938 C.L. Poole of Westbourne (now part of the Canberra suburb of Yarralumla), advertised the sale of Daphne,

Boronia, Camellia, Azalea, Hydrangeas and Lilacs. This seems to have been an once only sale, with Mary Poole then establishing a florist rather than nursery business. In March 1940, Pike and Campbell, of Queanbeyan, advertised roses, fruit trees and bulbs, though they seem to have been produce merchants rather than nurserymen.

Post war growth 1945 - 1985

The post war period was marked by a considerable expansion in nursery activity. By 1950 several suburbs were planted with street trees and many new species were brought in from overseas, while experimental trials were established to test the suitability of these plants. In 1950 some 40,000 trees and shrubs were established in public areas, and 20,000 issued to householders. Around that time there were 4,486 residences and garden plots in the City area (Unpublished manuscripts A431 \ 1273 and 1274).

Since 1950 Canberra's size has increased many fold. The beautification of this sprawl has been an immense task, involving millions of plants. The types of species planted have changed considerably over time, and these differences are reflected in variations in plantings between suburbs developed during differing decades.

Of the species recorded in the 1949 stock list of the government nursery, 15% were natives; in 1963 they had increased to 25%; by 1975 they had risen to 30%. As well as this shift towards greater native planting, increasing use has been made of quicker growing foreign plants, such as silver birch *(Betula pendula)*, claret ash *(Fraxinus oxycarpa)* and poplar (*Populus sp.*), at the expense of slower growing trees including oak *(Quercus)* and cedar *(Cedrus)*.

Since 1966 there have been, at the very least, annual stock takes of the government nurseries. Records of these stock takes are kept at the Yarralumla nursery, and in the Parks and Gardens archive repository. Planting activity between 1940 and 1966 was pieced together by reading hundreds of inwards and outwards correspondence files, held at the Parks and Gardens archive, the Department of Capital Territories archive, and at the Australian Archives (Unpublished manuscripts CA764, CA31, CA27, CA226).

From 1956, the free distribution of surplus stock was restricted to householders in new subdivisions only, rather than to all new leaseholders. In 1963, the new landholders were restricted to ten trees and 40 shrubs. As a result, private nurseries have become increasingly important. Between 1948 and 1950 three nurseries were established at Pialligo. They were the Beluevere Nursery, advertising roses, daphnes, gardenias, camellias, fuchsias, ferns in baskets, azaleas, and shrubs and trees of all descriptions; Southwell Nursery, specializing in fruit trees; and Willow Park Nursery offering lilac, daphne, roses, rhododendrons, camellias, conifers, fruit and shade trees, silver birch, copper beach, magnolias, spruce and Japanese maples. Australian Capital Territory telephone directories indicate that, by 1955, these nurseries were joined by Mann's of Queanbeyan, while these four nurseries had seven other competitors between 1965 and 1970. Twenty seven nurseries or plant sellers were listed in 1980.

Unfortunately none of these local nurseries produced catalogues that have survived, so it is difficult to assess their sales. Between 1948 and 1982 the Canberra Horticultural Society produced seven editions of The Canberra Gardener. Plants recommended in these guides may indicate the type of stock sold by the private nurseries. In the later editions there are considerably more native species recommended than in the earlier editions. Plants such as *Cupressus goveniana* and allspice (*Calycanthus floridus)* are only recommended in the three editions before 1959, but plants including Golden wattle (*Acacia pycnantha),* swamp paper bark *(Melaleuca ericifolia)* and *Correa X manii* are only recommended in the three editions since 1969. Species recommended in all seven editions include 10 fruit trees, strawberry tree (*Arbutus unedo), Cotoneaster glaucophyllus, Hydrangea macrophylla,* Mountain laurel *(Kalmia latifolia), Lonicera nitid*a and *Wisteria sinensis.* Of seven major Canberra nurseries approached only Willow Park allowed me to examine their ordering records. (These records must be kept for at least seven years for taxation purposes). Over the last 10 years the major plants sold by this nursery that are not grown in the government nurseries include camellias, fuschias, rhododendrons, roses and a large number of small conifers (Mulvaney 1987).

Overview of Canberra's planting record

Canberra's planting record has been traced through four major sources. Two of these sources, the records of Willow Park and the Government nurseries,

provide information on the extent of plantings of particular species. The remaining sources, The Canberra Gardener and nursery catalogues, provide information from which may be inferred the probable popularity and period of planting of a species in the Canberra area.

As detailed previously, the majority of Canberra's planting has been performed by Government bodies. The record of their activity is vast. This documentation was sampled by examining, where possible, three years of records for each decade, since the inception of the first Government nursery in 1912. The years from which data were obtained were 1912, 1915, 1918, 1923, 1924, 1928*, 1930*, 1934, 1936, 1946*, 1948*, 1949*, 1952*, 1953(fruit tree census), 1960*, 1963*, 1966, 1969, 1972, 1975, 1978, 1981, and 1984. Not all periods were equally well documented, those years marked thus, *, are years for which information on individual species is small, in proportion to the total number of plants issued, planted, or imported by the nursery, during that year. In total, over 2,000 woody ornamental species have been raised or nurtured in Canberra's Government nurseries. The Government nursery records sampled, together with those of the Willow Park Nursery provided documentation for around 2,000,000 individual plantings of trees or shrubs. If the estimate in Anon (1980), that more than 12 million trees have been planted in Canberra, is correct and we assume that half of Canberra's plantings were of trees, then the percentage of plantings sampled is probably about 5 to 10 percent.

In order to combine the information contained in the nursery records with that in nursery catalogues and the seven editions (1942- 1986) of The Canberra Gardener, it was deemed that a mention in a nursery catalogue of a company active in the Canberra area, or in an edition of The Canberra Gardener, was equivalent to a nursery record of fifty individuals of that species actually being planted. This was purely arbitrary, but the figure did distinguish frequently mentioned plants from those not mentioned, without affecting too greatly the integrity of the existing documented record.

Appendix 4 provides a list of the species recorded from all sources, the period in which they first appeared in the record, and the relative amount of recorded and inferred planting. A list of Canberra's most common plantings is contained in Mulvaney (1986).

2.7 An overview of the South-eastern Australian woody ornamental planting record

A record of the timeframe and relative quantity of the planting of thousands of woody ornamental species in the cities of Adelaide, Canberra, Melbourne and Sydney, has been established. The plantings of Canberra are well documented by government records. The planting record of the other cities was largely deduced from nursery catalogues.

The history of Canberra's woody plantings has much in common with that recorded in catalogues of Adelaide, Melbourne, and Sydney: an early reliance on useful plants; a large diversity of plantings during Victorian times; the rose dominating the plantings of the 1930s; and popularity of Australian species in recent years.

Of importance to this thesis, is the consistent popularity, over time and space of many plants that are now recognised as intrusive species. Specifically, species that are either dark hued Australian natives, fruit trees and flowering shrubs with dark foliage. This suggests that historical factors may be a significant factor in a plants ability to become invasive. This supposition will be tested in chapter 4. The excellent documentation of Canberra's planting history makes it a particularly good data set on which to test for the influence of introduction pressure. Before this test begins however, it is necessary to identify all intrusive species.

CHAPTER 3. THE GARDEN ESCAPEES

Of the approximately 5,000 woody ornamental species planted in the cities of Adelaide, Canberra, Melbourne, and Sydney, at least 289 (about 6%) have spread from gardens and become established in bushland. Of these escapee species 106 (about 2%) are invasive. Perhaps it is not surprising that the percentage of spreading plants is small, when one considers that gardening frequently involves nurturing mutant, malformed, maladapted plants against destruction by the forces of natural selection. It is interesting to note, however, that these proportions of immigrant and invasive plants, correspond well with those postulated by Groves 1986 (b), for all types of plants introduced into the whole of Australia.

A full list of the spreading species is provided, together with the cities in which they have become established (Table 3.1). City limits were gauged by the edge of surburban development, and defined by being within 50km. of the Central Post Office of Sydney, or within 40km. for Adelaide and Melbourne. The city area of Canberra has been defined by Chan (1980), and basically includes the north western quarter of the Australian Capital Territory. All naturally occurring species within these city limits, were deemed local species. These species were not considered as spreaders, even if they have expanded their local range, through spread from garden plantings. Thus although Robin and Carr (1986) report that *Acacia longifolia* is spreading from gardens into areas of East Melbourne where it was formerly not found, it is not considered here as an intrusive species as it occurs naturally within the greater Melbourne area.

At least three weeks was spent in each city, during the spring and summer of 1986, searching bushland for garden escapees. Bushland in Canberra was also searched periodically from the spring of 1986 till the summer of 1988, while an additional 10 days was spent searching Sydney's bushland in the autumn of 1987. Obviously it was impossible to investigate all bushland, or every square metre of a particular bushland site. In deciding which bushland areas to survey, care was taken to sample all vegetation types, occurring in a particular city, as defined by Specht (1972): Adelaide, National Capital Development Commission (1983): Canberra, Land Conservation Council (1973): Melbourne and Kartzoff (1969): Sydney. All types of

vegetation were sampled, as differing vegetation types reflect differing environmental conditions, and hence differing habitats potentially suitable for different types of garden escapees.

Sites of a particular vegetation type were sampled, if possible, to include areas adjoining old, middle aged and newly established suburbs. This was attempted because bushland areas adjoining suburbs of different ages have been and are, subject to a differing influx of propagules, from nearby gardens, whose plantings frequently reflect the changing whims of fashion. Bushland in the older areas of a city also is usually more disturbed, by paths, pollutant runoff, and rubbish dumping, than that in new areas of suburbia.

Unfortunately the variety of vegetation types surviving as urban bushland is often small, with the majority of bushland being open forest, and often located on the city outskirts, adjacent to new suburbs. Open forest is common because this frequently occurs on dry rocky soils, upper hill or mountain slopes, or steep gully sides. Such areas were unsuitable for intensive agriculture, and as housing development encroached were left for their landscape value, or because they prove toc difficult to build upon. Open forest, therefore, was the vegetation type most often searched. The proportion of occurrences of open forest sampled was small, however, compared to other vegetation types, such as woodland or riverine communities, where surviving areas of urban bushland are so few that it is possible to survey all, or most of these sites.

The methodology followed in my fieldwork was to search initially the least disturbed parts of a particular bushland area for between ten minutes and one hour, depending on the size of the reserve, to obtain familiarity with the local flora. This assisted in distinguishing introduced Australian plants, or deceptively native-looking foreign plants, from local species. Within any bushland site, most introduced plants are established near its boundaries with gardens, or along creek lines, both areas of large propagule, moisture and nutrient input. Between thirty minutes and three hours were subsequently spent searching these areas on foot for garden escapees. Much time also was spent driving around and through large areas of bushland, searching for species established by the roadside. An indication of the areas searched is given in figures 3.1 to 3.4.

Figure 3.1 AREAS OF ADELAIDE'S BUSHLAND THAT WERE SEARCHED FOR INTRUSIVE SPECIES

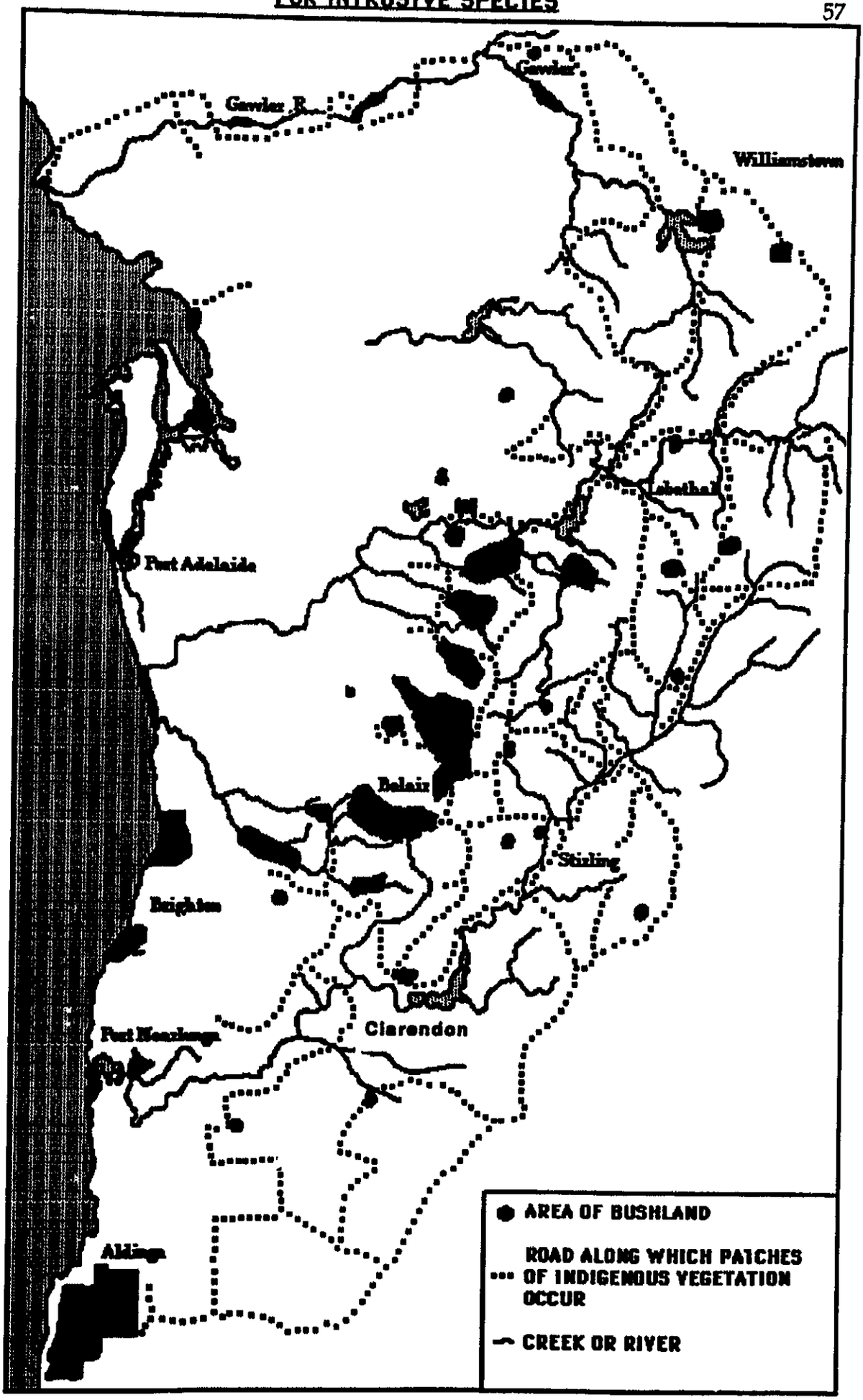


Figure 3.2 AREAS OF CANBERRA'S BUSHLAND THAT WERE SEARCHED FOR INTRUSIVE SPECIES

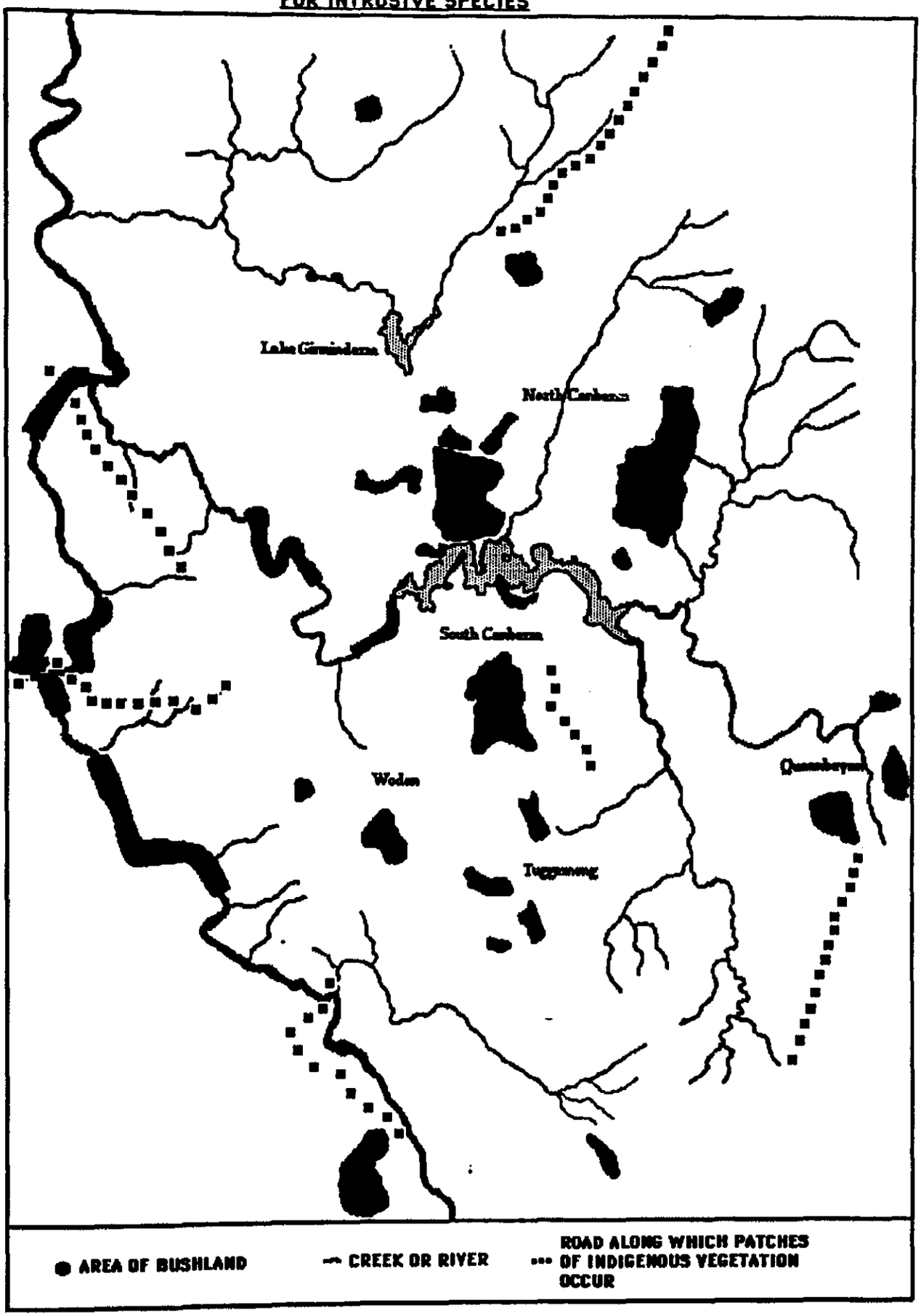


Figure 3.3 AREAS OF MELBOURNE'S BUSHLAND THAT WERE SEARCHED FOR INTRUSIVE SPECIES

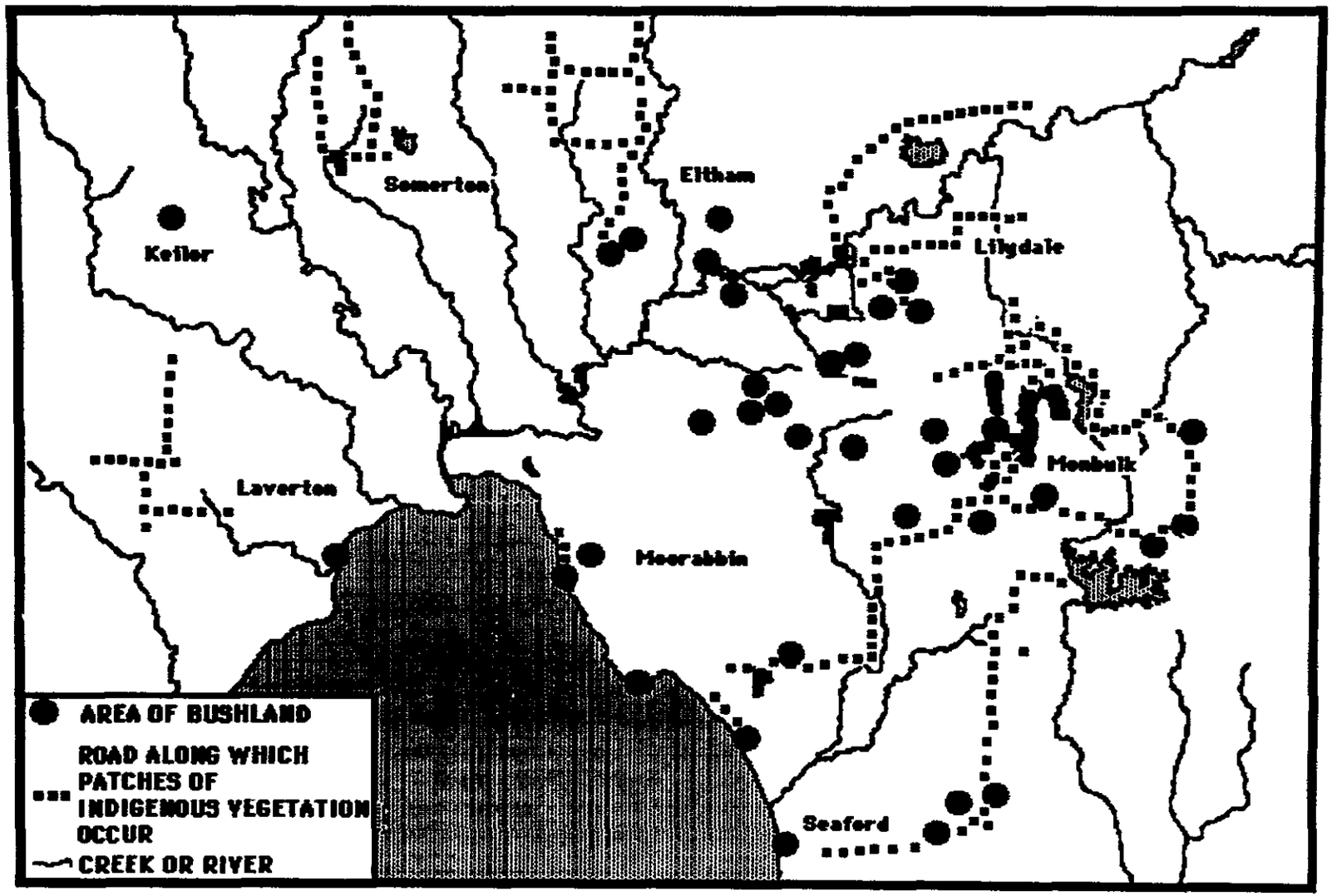
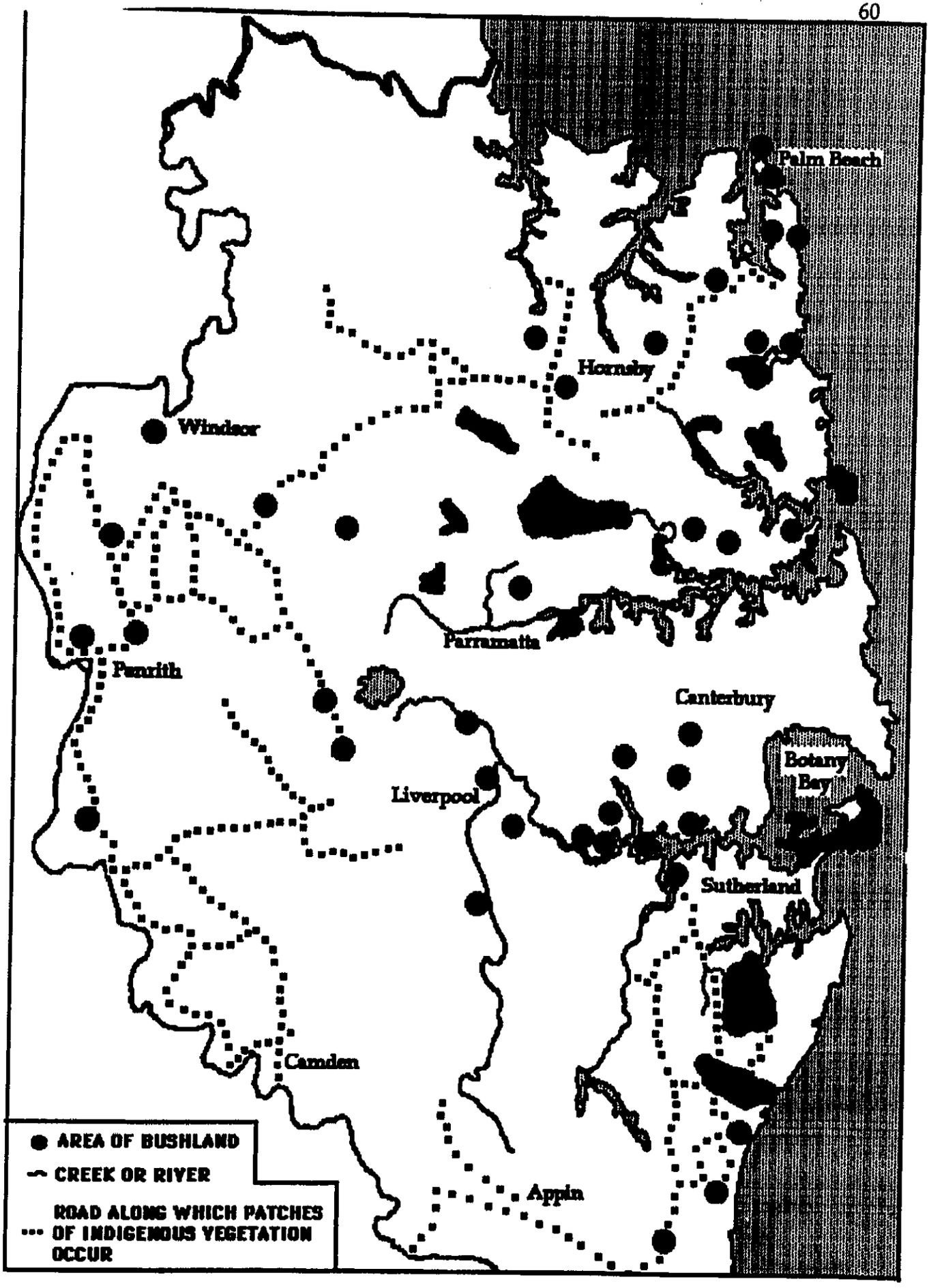


Figure 3.4 AREAS OF SYDNEY'S BUSHLAND THAT WERE SEARCHED FOR INTRUSIVE SPECIES



Deliberate bushland plantings of exotic species and true intrusive plants were discriminated against on the grounds that deliberate plantings would be marked by one or more of the following:

- disturbed earth in a small ring around a plant, or furrowing of soil;
- staking of plant;
- plants occurring in a straight line or other geometric arrangement; and
- plants being all the same age.

In order to determine the relative frequency of individual invasive species in the bushland of each city intrusive species were counted in 200m transects. Thirty to thirty-five transects were surveyed in each of the cities of Adelaide, Canberra and Melbourne, with transects being divided into 20 x 20 metre quadrats. A plant was taken to include any rooted individual unit, so that suckers and canes were counted as individual plants.

A species that was dominant in a 20m X 20m area of bushland was considered as an invasive species. Sparsely established species were considered as immigrants.

All but fourteen of the 225 species collected (marked thus * in table 3.1) have been deposited in herbaria. These fourteen are all poor specimens, whose collection adds little to their known established occurrences. Plants collected from the bushland of Adelaide, are lodged in the State Herbarium of South Australia; those from Melbourne, in the National Herbarium, Melbourne; while those from Canberra and Sydney are lodged in the Herbarium Australiense, C.S.I.R.O., Canberra. Many of the specimens collected are either the first collection made of a particular species established in South-eastern Australia, or extend the recorded range.

Obviously only a proportion of each city's bushland was searched in three weeks. In addition, many of the established plants listed were found in only one or a few locations. It is certain therefore, that the survey missed some garden escapees. To compensate for the selectivity of the approach, a literature and herbarium search was conducted, for evidence of invasive and immigrant plants in bushland. Information also was sought from bushland managers and researchers. Unfortunately one cannot be certain of the identity of any species in published lists, or given as personal

communications. It also is frequently unclear, both in published lists and herbarium notes, whether a plant derives from an area of bushland, as defined in chapter 1, or how large an area it dominates. Unless otherwise stated, species whose intrusive status was only recognised through publications or herbarium notes are treated as immigrants in this thesis.

3.1 Comparison of the escapee flora of the different cities.

One of the most noticeable features of table 3.1, is the uniqueness of each city's list of woody garden escapees. Of the 289 established species, only four are invasive in all cities: *Acacia baileyana, Genista monspessulana, Lycium ferocissimum,* and *Pinus radiata.* Nineteen (around 6.5%) were found in all cities either as invasive or immigrant plants. In contrast, just over half of all the species listed occur only in the bushland of one city.

Although each city has a distinctive escapee list, they do share some similarity, with some being more alike than others. There are 145 spreading species in Adelaide, 85 in Canberra, 110 in Melbourne, and 134 in Sydney. If the lists are rearranged so that 145 species from the list of 289, were randomly assigned to Adelaide, and 85 randomly assigned to Canberra, and so on for Melbourne and Sydney, it would be expected that a number of species would be shared between, or be absent from, both of two cities. Similarly a certain number of species would be expected to occur only in one of either of the two cities. The actual or observed numbers of species shared, not shared, or absent from two cities, can then be tested by chi-squared analysis, to ascertain whether they differ significantly from the expected numbers. The degrees of similarity between two city escapees lists are given in table 3.2. At the level of making a correct assumption 95% of the time (= 0.05) the lists of Sydney and Adelaide, and Sydney and Canberra, are significantly different, while those of Melbourne and Adelaide are significantly similar.

Table 3.2 Similarity between the escapee lists of Adelaide, Canberra, Melbourne and Sydney.

	CANBERRA	MELBOURNE	SYDNEY
ADELAIDE	X^2 = 0.11(n.s.)	X^2 = 6.55(+)	X^2 = 8.86(-)
SYDNEY	X^2 = 7.94(-)	X^2 = 0.58(n.s)	
MELBOURNE	X^2 = 3.48(n.s.)		

X^2 = Chi-squared Statistic
(+) = Significantly similar at = 0.05
(-) = Significantly different at = 0.05
(n.s) = Not significantly different, or similar at = 0.05

It is not surprising that Melbourne and Adelaide share similar species, given their similar planting records and climate.

It is of relevance to note that Sydney has fewer non-local Australian intrusive species than any other city, which seems to correspond with the low level of non-local Australian plantings in this city.

Other reasons for the differences and similarities between cities are examined in the following chapters. In this examination, the intrusive species listed in table 3.1 are compared against the thousands of woody plants that have not spread from their areas of planting. The identity of those plants that have not spread from their original plantings can be obtained from appendices 1 - 4.

Table 3.1 WOODY INTRUSIVE TAXA OF BUSHLAND IN ADELAIDE, CANBERRA, MELBOURNE AND SYDNEY.

	ADL	CAN	MEL	SYD
Abutilon grandifolium (Willd.) Sweet	-	-	-	HERB
Acacia baileyana F.Muell.	I	I	I	I
Acacia boormannii Maiden	-	-	REF(18)	-
Acacia cultriformis G.Don	-	M	-	-
Acacia cyclops G.Don	M	-	-	-
Acacia dealbata Link	I	L	L	L
Acacia decurrens Willd.	M	I	M	L
Acacia drummondii Lindley	REF(12)	-	-	-
Acacia elata Benth.	-	M	I	L
Acacia fimbriata G.Don	M	-	-	L
Acacia floribunda (Vent.) Willd.*	-	-	M	-
Acacia howittii F. Muell.	-	-	REF(10,18)	-
Acacia iteaphylla Benth.	M	-	-	-
Acacia mearnsii De Wild.	M	L	L	L
Acacia podalyriifolia G.Don	I	-	REF(10,18)	M
Acacia pravissima Benth.	-	-	REF(18)	-
Acacia prominens G.Don	-	-	HERB	L
Acacia saligna (Labill.) H.L.Wendl	I	-	HERB	M
Acacia sclerosperma F.Muell.	M	-	-	-
Acer negundo L.	M	M	-	M
Acer palmatum Thunb.	-	-	REF(18)	-
Acer pseudoplatanus L.	M	-	I	-
Acmena smithii (Poiret) Merr. & Perry	-	-	REF(10)	-
Aeonium arboreum (L.) Webb & Berth.	I	-	-	-
Aesculus hippocastanum L.	M	-	-	-
Agave americana L.	I	M	M	M
Ailanthus altissima (Mille.) Swingle	I	I	-	-
Albizia lophantha (Willd.) Benth.	M	-	M	REF(4,6,11)
Alnus glutinosa (L.) Gaertner	-	I	-	-
Aloe arborescens Miller	M	-	-	M
Aloe saponaria (Aiton) Haw.	I	-	-	I
Angophora costata (Gaertner) Britten	REF(14)	-	REF(18)	L
Anredera cordifolia (Tenore) Steenis	-	-	-	I
Araujia hortorum Fourn.	I	-	I	I
Arbutus unedo L.	M	M	M	-
Artemisia arborescens L.	M	-	M	-
Arundo donax L.	I	-	-	M
Asclepias fruticosa L.	M			I
*Asclepias rotundifolia** Miller	I	-	-	-
Asparagus aethiopicus L.	-	-	-	REF(3)
Asparagus asparagoides (L.) W.Wight	I	-	I	I
Asparagus densiflorus (Kunth) Jessop	-	-	-	I
Asparagus officinalis L.	M	I	M	M
Asparagus setaceus (Kunth) Jessop	-	-	-	HERB
Asparagus scandens Thunb.	-	-	M	I
Berberis darwinii Hook.	-	-	REF(17)	-
Bougainvillaea X buttiana Holtt. & Standl	-	-	-	REF(15)
Brachychiton acerifolius F.Muell.	-	-	-	M
Buddleja davidii Franchet	M	M	-	-
Buddleja madagascariensis Lam.	I	-	-	HERB
Callistemon citrinus (Curtis) Stapf	-	I	REF(10)	L

	ADL	CAN	MEL	SYD
Callistemon phoeniceus Lindley	M	-	-	-
Calothamnus affinis Turcz.	M	-	-	-
Calothamnus quadrifidus R.Br.	M	-	-	-
Calothamnus rupestris Schauer	M	-	-	-
Cardiospermum grandiflorum Sw.	-	-	-	I
Cassia coluteoides Colladon	-	-	-	I
*Cassia floribunda** Cav.	-	-	-	M
Casuarina glauca Sprengel	M	-	-	-
Celtis australis L.	-	I	-	-
Celtis occidentalis L.	-	-	-	M
Cestrum elegans (Neumann) Schldl.	-	-	REF(1)	-
Cestrum parqui L'Her	M	-	-	M
Chamaecytisus proliferus (L.f.) Link	I	I	I	-
Chrysanthemoides monilifera (L.) Norlindh	I	-	I	I
Cinnamomum camphora T.Nees & C.Eberm.	M	-	-	I
Citrus jambhiri Lushington	-	-	-	REF(9)
Clytostoma callistegioides (Cham.) Bur.	-	-	-	HERB
Coleonema album (Thunb.) Bartl.& H.L. Wendl.	M	-	-	-
Coprosma repens A.Rich.	M	-	I	I
Cordyline terminalis (L.) Kunth	-	-	REF(10)	-
*Cortaderia selloana** (Schultes & J.H. Schultes) Asch. & Graebner	M	I	I	I
Cotoneaster franchettii Boiss.	-	M	-	-
Cotoneaster glaucophyllus Franchet	M	I	I	I
Cotoneaster horizontalis Decne	-	M	-	-
Cotoneaster pannosus Franchet	M	I	I	M
Cotoneaster rotundifolius Lindley	-	M	-	-
Cotoneaster simonsii Baker	M	I	I	-
Cotyledon orbiculata L.	M	-	-	M
Crassula tetragona L.	-	-	M	-
Crataegus crus-galli L.	-	M	-	-
Crataegus monogyna Jacq.	I	I	I	-
Crataegus phaenopyrum (L.f.) Medic.	-	M	-	-
Crataegus sinaica Boiss.	M	-	-	-
Crataegus X lavallei Herincq.	-	M	-	-
Crataegus X prunifolia (Lam.) Pers.	-	M	-	-
Crotalaria semperflorens Vent.	-	-	-	M
Cupressus arizonica Greene	-	M	-	-
Cupressus goveniana Gord.	M	-	-	-
Cupressus macrocarpa Gord.	-	-	M	-
Cydonia oblonga Miller	M	M	-	-
Cyperus alternifolius L.	-	-	-	M
Cytisus scoparius (L.) Link	I	M	I	-
Dampiera cuneata R.Br.	<I>REF(13)	-	-	-
Darwinia citriodora (Endl.) Benth.	M	-	-	-
Diosma ericoides L.	-	-	REF(10)	-
Dipogon lignosus (L.) Verdc.	M	-	I	M
Dodonaea viscosa Jacq.	-	L	REF(10)	L
Dryandra praemorsa Meissner	M	-	-	-
Erica arborea L.	I	-	M	-
Erica lusitanica Rudolphi	I	-	I	HERB
Eriobotrya japonica (Thunb.) Lindley	-	-	M	M
Erythrina lysistemon Hutch.	-	-	-	REF(5)
Erythrina X skyesii * Barneby & Krukoff	-	-	-	I

	ADL	CAN	MEL	SYD
Eucalyptus botryoides Smith	-	-	REF(10)	L
Eucalyptus citriodora Hook.	-	-	-	REF(11)
Eucalyptus ficifolia F.Muell.	REF(14)	-	-	-
Eucalyptus globulus Labill.	REF(14)	M	-	-
Eucalyptus saligna Smith	-	-	REF(18)	-
Eucalyptus spathulata Hook.	-	-	REF(18)	-
Euryops abrotanifolius (L.) DC>	-	-	HERB	-
Ficus carica L.	I	-	M	-
Ficus elastica (Hornem.) Roxb.	-	-	M	M
Ficus pumila L.	-	-	M	M
Fraxinus angustifolia Vahl.	-	-	I	-
Fraxinus excelsior L.	-	I	M	-
Fraxinus oxycarpa Willd.	I	M	-	-
Fuchsia magellanica Lam.	I	-	-	-
Genista linifolia L.	HERB	-	M	I
Genista maderensis (Webb & Berth.) Lowe	HERB	-	-	-
Genista monspessulana (L.) Lam	I	I	I	I
Gleditsia triacanthos L.	-	-	-	I
Grevillea aquifolium Lindley	M	-	-	-
Grevillea biternata Meissner	M	-	-	-
Grevillea robusta R.Br.	-	-	REF(10)	M
Grevillea rosmarinifolia Cunn.	M	I	-	-
Grevillea trifida (R.Br.) Meissner	M	-	-	-
Grevillea X"(Canberra gem)"	-	M	-	-
Hakea bipinnatifida R.Br.	M	-	-	-
Hakea cristata R.Br.	M	-	-	-
Hakea eriantha R.Br.	-	M	-	-
Hakea laurina R.Br.	I	-	-	-
Hakea orthorrhyncha F.Muell.	M	-	-	-
Hakea salicifolia Meissner	M	-	REF(10)	L
Hakea sericea Schrader & Wendl.	M	L	L	L
Hebe parviflora (Vahl) Cockayne & Allan	M	-	-	-
Hedera helix L.	M	I	I	I
Hedychium coronarium Konig	-	-	-	I
Hypericum androsaemum * L.	-	-	I	-
Ilex aquifolium L.	I	-	I	-
Indigofera incarnata (Willd.) Nakai	-	-	-	M
Ipomoea cairica (L.) Sweet	-	-	-	I
Ipomoea indica (Burman) Merr.	-	-	I	I
Ipomoea purpurea (L.) Roth	-	-	-	M
Jacaranda mimosifolia D.Don	-	-	-	I
Jasminum mesnyi Hance	-	-	-	M
Jasminum polyanthum Franchet	-	-	-	M
Juniperus chinensis L.	-	M	-	-
Kalanchoe pinnata (Lam.) Pers.	-	-	-	I
Kennedia nigricans Lindley	REF(7)	-	-	-
Kennedia rubicunda Vent.	-	-	REF(8)	L
Lagunaria patersonii (Aiton) G.Don	M	-	-	HERB
Lantana camara L.	-	-	M	I
Lavandula stoechas L.	I	-	HERB	-
Leonotis leonurus R.Br.	-	-	-	M
Leptospermum laevigatum (Gaertner) F.Muell.	M	-	L	L
Leycesteria formosa * Wall	-	-	M	-
Ligustrum lucidum Aiton	-	M	I	I

	ADL	CAN	MEL	SYD
Ligustrum sinense Lour.	-	I	-	I
Ligustrum vulgare L.	M	-	M	-
Lonicera fragrantissima Lindley & Paxton	-	M	-	-
Lonicera japonica Thunb.	-	I	I	I
Lycium barbarum L.	-	-	HERB	-
Lycium ferocissimum Miers	I	I	I	I
Maclura pomifera (Raf.) Schneider	-	-	-	HERB
Mahonia aquifolium (Pursh) Nutt.	-	M	-	-
Malus domestica Borkh.	M	M	I	M
Melaleuca armillaris (Gaertner) Smith	M	-	REF(10)	L
Melaleuca ericifolia Smith	-	M	L	L
Melaleuca hypericifolia Smith	M	-	REF(10)	L
Melaleuca nesophila F.Muell.	M	-	-	-
Melaleuca radula Lindley	M	-	-	-
Miscanthus sinensis Andersson	-	-	-	HERB
Monstera deliciosa Liebm.	-	-	-	M
Morus alba L.	M	-	-	M
Muraltia heisteria (L.) DC	REF(7)	-	-	-
Musa X paradisiaca * L.	-	-	-	M
Myoporum acuminatum R.Br.	I	-	-	L
Myrtus communis L.	M	-	-	-
Nandina domestica Thunb.	-	M	-	-
Nerium oleander L.	-	-	-	M
Nicotiana glauca Graham	M	-	-	M
Ochna serrulata (Hochst. Walp.	-	-	-	I
Olea africana Miller	I	M	-	I
Olea europaea L.	I	-	I	-
Opuntia imbricata (Haw.) DC	-	-	M	-
Opuntia robusta Pfeiffer	I	-	M	-
Opuntia stricta (Haw.) Haw	M	M	I	M
Opuntia vulgaris Miller	M	-	-	-
*Parthenocissus quinquefolia** (L.) Planchon	-	-	-	M
Passiflora caerulea L.	-	-	-	HERB
Passiflora edulis Sims	-	-	-	I
Passiflora mollissima (Kunth) L.Bailey	-	-	HERB	-
Passiflora subpeltata (Ortega)	-	-	-	REF(16)
Pelargonium capitatum (L.) Aiton	-	-	-	M
Pelargonium X domesticum L.Bailey	M	-	M	M
Pelargonium X hortorum L.Bailey	M	-	M	M
Photinia serrulata Lindl.	-	M	-	-
Phyllostachys aurea Riv.	-	-	-	I
Physalis peruviana L.	-	-	-	M
Pimelea ferruginea Labill.	-	-	REF(18)	-
Pinus halepensis Miller	I	M	-	-
Pinus nigra A.F.Arnold	I	-	M	-
Pinus pinaster Aiton	I	-	I	-
Pinus ponderosa IDouglas	M	-	-	-
Pinus radiata D.Don	I	I	I	I
Pistacia chinensis Bunge	-	M	-	-
Pittosporum eugenioides Cunn.	-	-	REF(18)	-
Pittosporum undulatum Vent.	I	-	I	L
Platanus orientalis L.	-	-	REF(18)	-
Platanus X acerifolia (Ait.) Willd.	-	M	-	-
Plumeria rubra L.	-	-	-	HERB

	ADL	CAN	MEL	SYD
Polygala myrtifolia L.	M	-	I	I
Polygala virgata Thunb.	-	-	-	M
Polygonum capitatum D.Don	-	-	-	M
Populus alba L.	M	I	M	I
Populus nigra L.	M	I	M	M
Prunus armeniaca L.	M	M	-	M
Prunus cerasifera Ehrh.	M	I	I	-
Prunus domestica L.	M	-	-	-
Prunus dulcis (Miller) D.Webb	M	-	-	-
Prunus laurocerasus L.	I	-	REF(1)	-
Prunus persica (L.) Batsch	M	M	M	M
Psoralea pinnata L.	-	-	REF(10)	M
Pyracantha angustifolia (Franchet) Schneider	M	I	I	I
Pyracantha coccinea M.J. Roem.	-	M	-	-
Pyracantha crenulata (Roxb.) Roemer	-	I	I	I
Pyracantha fortuneana (Maxim) Li	-	I	M	I
Pyracantha rogersiana Bean	-	I	-	-
Pyrus callervana Decne.	-	M	-	-
Pyrus communis L.	M	M	-	M
Quercus ilex L.	-	I	-	-
Quercus palustris Muenchh.	-	M	-	-
Quercus robur L.	M	I	I	M
Quercus suber L.	M	-	-	-
Raphiolepis indica (L.) Ker Gawler	-	-	-	HERB
Rhamnus alaternus L.	I	-	-	-
Rhus succedanea L.	-	-	-	I
Ricinus communis L.	I	-	REF(8)	M
Robinia pseudoacacia L.	M	I	-	I
Rosa canina L.	I	-	M	
Rosa rubiginosa L.	M	I	I	HERB
Rosmarinus officinalis L.	M	-	-	-
Rubus discolor Weihe & Nees	-	-	-	HERB
Rubus laciniatus Willd.	-	-	M	M
Rubus procerus Muller	-	-	-	HERB
Rubus ulmifolius Schott	I	I	I	HERB
Rubus vulgaris Weike et Nees	-	-	-	I
Salix alba L.	-	I	I	-
Salix babylonica L.	M	I	I	I
Salix cinerea L.	-	-	M	-
Salix fragilis L.	-	-	I	-
Salix X rubens Schrank	M	-	-	-
Schinus molle L.	I	-	I	I
Selago corymbosa L.	-	-	-	HERB
Senecio angulatus L.	M	-	M	-
Senecio macroglossus DC	-	-	-	M
Senecio mikanioides Walp.	M	-	I	I
Solanum mauritianum Scop.	-	-	-	M
Solanum pseudocapsicum L.	-	-	HERB	M
Sollya heterophylla Lindley	I	-	I	-
Sorbus domestica L.	-	I	-	-
Spartium junceum L.	-	M	M	-
Spiraea cantoniensis Lour.	-	M	-	-
Spiraea japonica (L.f.) Thunb.	-	M	-	-

	ADL	CAN	MEL	SYD
Syringa vulgaris L.	M	-	-	-
Tamarix aphylla (L.) Karsten	M	-	-	-
Tamarix gallica L.	-	-	M	-
Tecomaria capensis (Thunb.) Spach	-	-	-	I
Tephrosia grandiflora (Vahl) Pers.	-	-	-	HERB
Thunbergia alata Sims	-	-	-	I
Tibouchina urvilleana (DC) Cogn.	-	-	-	M
Tristania conferta R.Br.	-	-	-	M
Ulex europaeus L.	I	I	I	M
Ulmus parvifolia Jacq.	-	M	-	-
Ulmus procera Salisb.	I	M	-	-
Ulmus X hollandica Miller	I	I	-	-
Viburnum suspensum Lindl.	-	-	-	HERB
Viburnum tinus L.	M	M	-	-
Vinca major L.	M	I	M	-
Vitis vinifera L.	M	M	M	M
Wigandia caracasana Kunth	M	-	-	-
Wisteria sinensis (Sims) Sweet	-	-	-	M
Yucca aloifolia L.	M	-	-	M
Yucca filamentosa L.	-	M	-	-

Key to Table 3.1

L = Local species

- = Species absent from cities bushland

I = Invasive species

I = Pest species (i.e. invasive in more than 10 separate bushland locations)

M = Immigrant species

HERB = Record of species being intrusive, gained from notes accompaning a herbarium specimen.

REF = Species recorded in literature or through personal communications.

<I>REF= Invasive species

(1) Anon, 1982. Bushland Weeds (pamphlet). Upper Yarra Valley and Dandenong Ranges Authority. Department of Conservation Forests and Lands. P.O. Box 104, Lilydale 2.

(2) Bridgewater, P. B. and Wellington, B. 1976.

Vegetation in the S.E. suburbs of Melbourne. 2: Native and introduced plant communities in a Mount Waverley reserve. Victorian Naturalist 93(3): 113-117

(3)-(6) Coveny, R. (1962-1979). Checklists of plant sightings and collections (unpub.).
(3) Dee Why Lagoon
(4) Frenchs Forest
(5) Glebe Gully, Randwick
(6) Towra Point

(7) Jessop, J. and Toelken, H. R. 1986. Flora of South Australia. Adelaide: South Australian Government Printing Division.

(8) Kirkpatrick, J. B. 1974. Plant invasion and extinction in a suburban coastal reserve. Australian Geographical Studies 12: 107-118

(9) McRae R.H.B. and Cooper (under revision) working paper housed in N.S.W. herbarium, lists some plants established in Sydney bushland.

(10) Paget, A. Researching Masters thesis on Indigenous Flora Conservation. Personnel Communication. (1987)

(11) Rawlings, Judith. Bush Regeneration Officer, National Trust, Sydney. Personnel Communication. (1987)

(12) Robertson, Enid. L. 1984. Watiparinga Reserve Management Plan. South Australia: The National Trust of South Australia.

(13) Robertson, Enid. L. Personnel Communication (1986)

(14) Taplin, Rosemary. Volunteer worker, State Herbarium of South Australia. Personnel Communication (1986)

(15) Thomas, J. and Benson, D. H. 1985. Vegetation survey of Ku-ring-gui Chase National Park. National Herbarium of New South Wales.

(16) Thomas, J., Burkitt, J. and Benson, D.H. 1984.

Vegetation survey of Bents Basin State Recreation Area. National Herbarium of New South Wales.

(17) Willis, J. H. 1972. A Handbook to Plants in Victoria. Vol 2: Dicotyledons. Melbourne University Press

(18) Carr, G. National Herbarium Melbourne. Personal Communication (1988).

CHAPTER 4 INTRODUCTION PRESSURE

4.1 Theoretical Considerations

Drawing on the data established in the preceding chapters, this chapter begins the examination into why some species are intrusive and others are not. The starting point is to postulate that certain species are intrusive, simply because they have had the greatest opportunity to be so. They are the species that have been planted in the largest numbers and/or over the longest period. There are several reasons why introduction pressure (opportunity to spread) may effect intrusiveness. These reasons are discussed below.

Shortening the odds. As MacArthur (1972 p84) points out, there is a large element of chance about whether or not a propagule reaches a suitable site for development. The chance of hitting a bull's eye (suitable site) with one dart (propagule) is much less than if 100 darts are thrown. The more propagules released, therefore, the greater the chance of that species finding a suitable site.

Salisbury (1953(a), and 1961 p19-20) noted that in the British Isles many weed species are present for a long time in low numbers, but when habitat changes occur that enable the populations to build up to a critical level, the populations become aggressive. Salisbury likened this to the infection pressure of epidemic disease. Salisbury (1961 p19) used Canadian fleabane (*Conyza canadensis*), sticky groundsel (*Senecio viscosus*), and wild lettuce (*Lactuca virosa* and *L. serriola*) as examples of species that have shown an infection pressure. These are all species that thrive on wasteland and whose rapid population growths, are attributed to the development of such habitats by expanding rail and road networks (ibid p56-62). Once established, some of these plants are able to spread into non waste ground areas. They may, for instance, become established in the disturbed ground around a fallen tree, in an otherwise uninhabitable woodland. As trees have always been falling down, this habitat has perpetually been available to the waste ground species, but they could not exploit it until their presence in the area reached such a level that seeds were likely to disperse there. In this context, it is interesting to note that Grime (1986) found that the commonest species

on industrial spoil heaps in the Sheffield district, in England, were all plants of high abundance in the region as a whole.

Second time lucky. Successful establishment depends on arrival at an appropriate time. Recurren' arrival or immigration will increase *"the likelihood of successful invasion, simply because the experiment of invasion is repeated many times under what are likely to be different conditions of weather, competition density, natural enemy abundances"* (Crawley 1986 p723), or habitat changes.

Spreading the net. The more widely a plant is distributed, the more likely it is that it will be planted near a site that is suitable for its establishment.

First in first served. A particular site, such as a cleared creek bank, may be suitable for the establishment of a large number of introduced species. It is possible, however, that the first introduced species, cover this available site, preventing any further invasions (Newsome and Noble 1986).

Genetic remodelling. It is seen as an advantage for a colonising or intrusive population to contain much genetic variation, to allow adaptation to varying habitats (Baker 1965, Robbins et al. 1983, Barrett and Richardson 1986). Planting a species in large numbers would increase variability, except for those species for which clonal propagation is the norm. With a popular planting one also might expect that multiple introductions, and therefore of varying source material, would occur. Within the garden environment itself, large long established populations also would aid cross fertilisation and opportunities for increased genetic variation. (See chapter 7.1 for further discussion on genetic considerations).

Aiding and abetting. A plant, that has escaped the confines of the garden, may need to cross fertilize with a plant still in cultivation, in order to produce viable offspring. Obviously the more cultivated plants there are close by, the more likely it is that such plants will reproduce.

4.2 Other studies

Despite the multiple reasons why introduction pressure may influence intrusiveness, it has been little studied. This is probably not because it is seen as unimportant, but because introduction pressure is so hard to measure; most introductions go unnoticed, let alone recorded. However, the few studies there have been, all warrant its further investigation; examples include:

Shaughnessy (1980 p319) found that human planting was a major factor in the spread of several, but not all, woody species invading the natural vegetation of the Cape Town region, South Africa;

The introductions of several bird species have not been successful when introduced in low numbers, but become established after repeated efforts in larger numbers. Examples include Sparrows (Ehrlich 1986), Starlings and Ringed-necked Pheasants (Krebs 1978 p25-30) in North America, and the Red-leg Partridge and the Little Owl in Britain (Conner 1986). In addition Newsome and Noble (1986) found that for the sixty-five foreign birds introduced into Australia, the number of propagules released influenced significantly whether a bird successfully established or not. Interestingly this was not the case for native birds, which in general were released in lesser numbers;

Crisp (1958) proposes that the Australasian barnacle (*Elminius modestus*) did not establish in British waters until the second world war brought increased shipping from Australasia, and with the ships came greater numbers of barnacles; and

Williamson (1989) found that both the total number of individuals released, and the number of releases were important to the success rate in biological control of insects, by insects, in Canada.

As well as these direct examples, several authors have found that species with large geographical ranges are significantly more likely to be intrusive than those with a restricted range (Graves and Goteli 1983, Forcella and Wood 1984, Moulton and Pimm 1986(a), Moulton and Scioli 1986, Forcella et al. 1986). There have been two explanations put forward for this correlation. Firstly, widespread species are ecological generalists, with much genetic diversity and are thus most adaptive in new situations (Robbins et al. 1983); secondly widespread species are more likely to be accidently

transported, or noticed and deliberately introduced by humans (Forcella and Wood 1984). This second explanation obviously relates to introduction pressure. Moulton and Pimm (1986(a) p237) do not consider the second explanation as a possibility, but against this is the evidence of Forcella and Wood (1984), who found no significant differences in the genetic variability of widespread and restricted species of three plant genera, even though the widespread species had proved significantly more invasive. Further support for the second explanation is gained from research that has found that species with widespread distributions are also most abundant locally, and hence more likely to be accidently transported. (See Hanski (1982) and Brown (1984) for reviews of this literature).

There are both ample evidence and theoretical considerations to suggest that introduction pressure is likely to be an important determinant of a species intrusive potential. This proposition will now be tested for the woody ornamentals planted in the capital cities of mainland South-Eastern Australia.

4.3 The influence of introduction pressure on the woody intrusive species of South- Eastern Australia.

Canberra will be examined first, as it has the best documented planting history. In figure 4.1 the 1,990 non-local species, recorded as being planted in the Canberra area, are grouped according to the number of recorded or inferred plantings. Thus species only known from catalogue records form the lowest, least planted group, while the rest of the species are divided into seven groups of about 200 species each, ranging from those with one to thirteen records of plantings, to those where over 2,713 individual plantings have been recorded. As is evident, there is a significant ($P<0.001$) relationship between intrusiveness and the number of times a species has been planted, and this is true for both invasive and immigrant species. Just under a quarter of all species in the most planted grouping are intrusive, while of the 1,000 least planted species only two are intrusive.

In figure 4.2 the 1,990 species have been arranged according to the period in which they were first introduced. The peak during the 1910 to 1930 period, coincides with the establishment of the government nursery, and doubtless

Figure 4.1

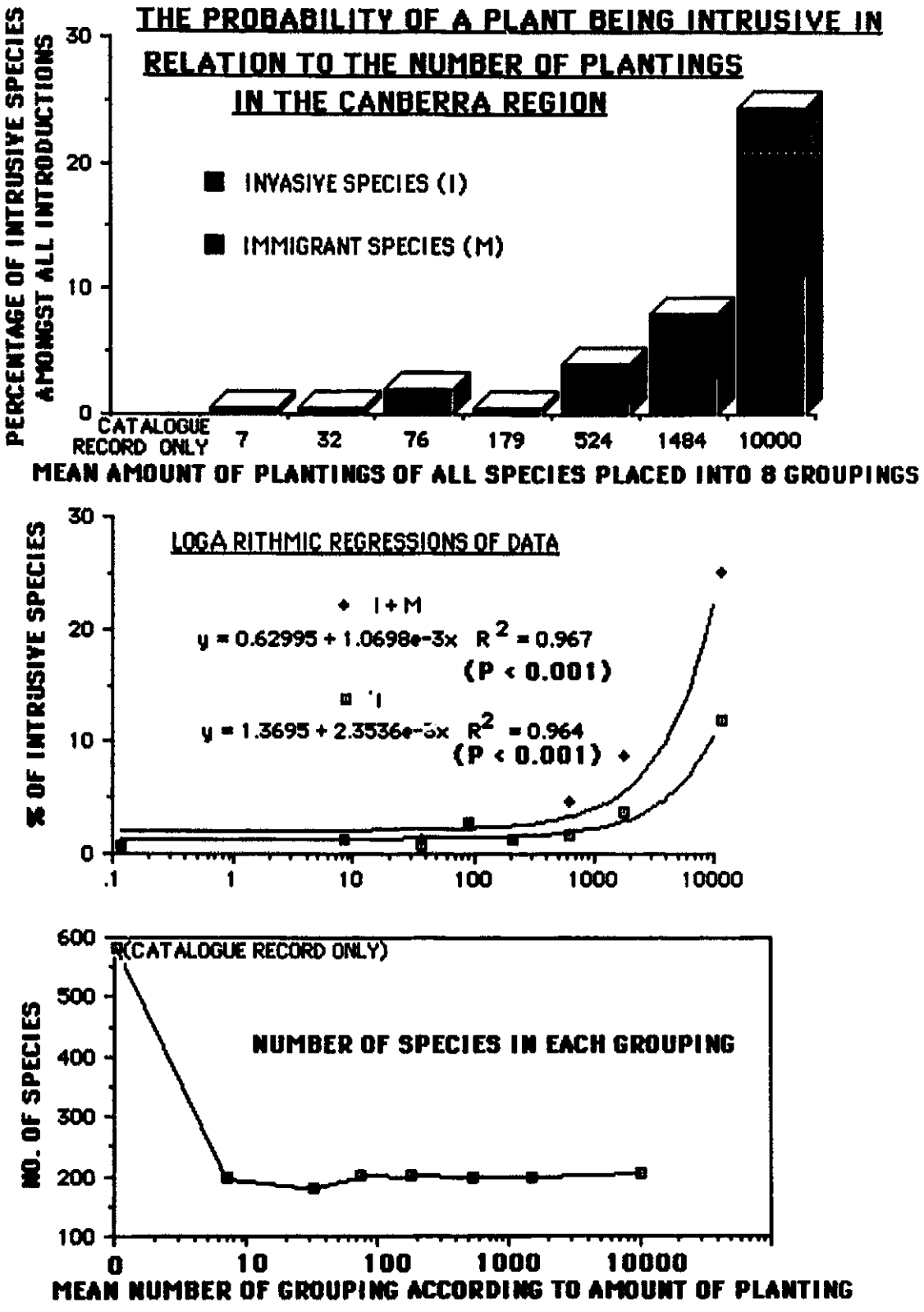
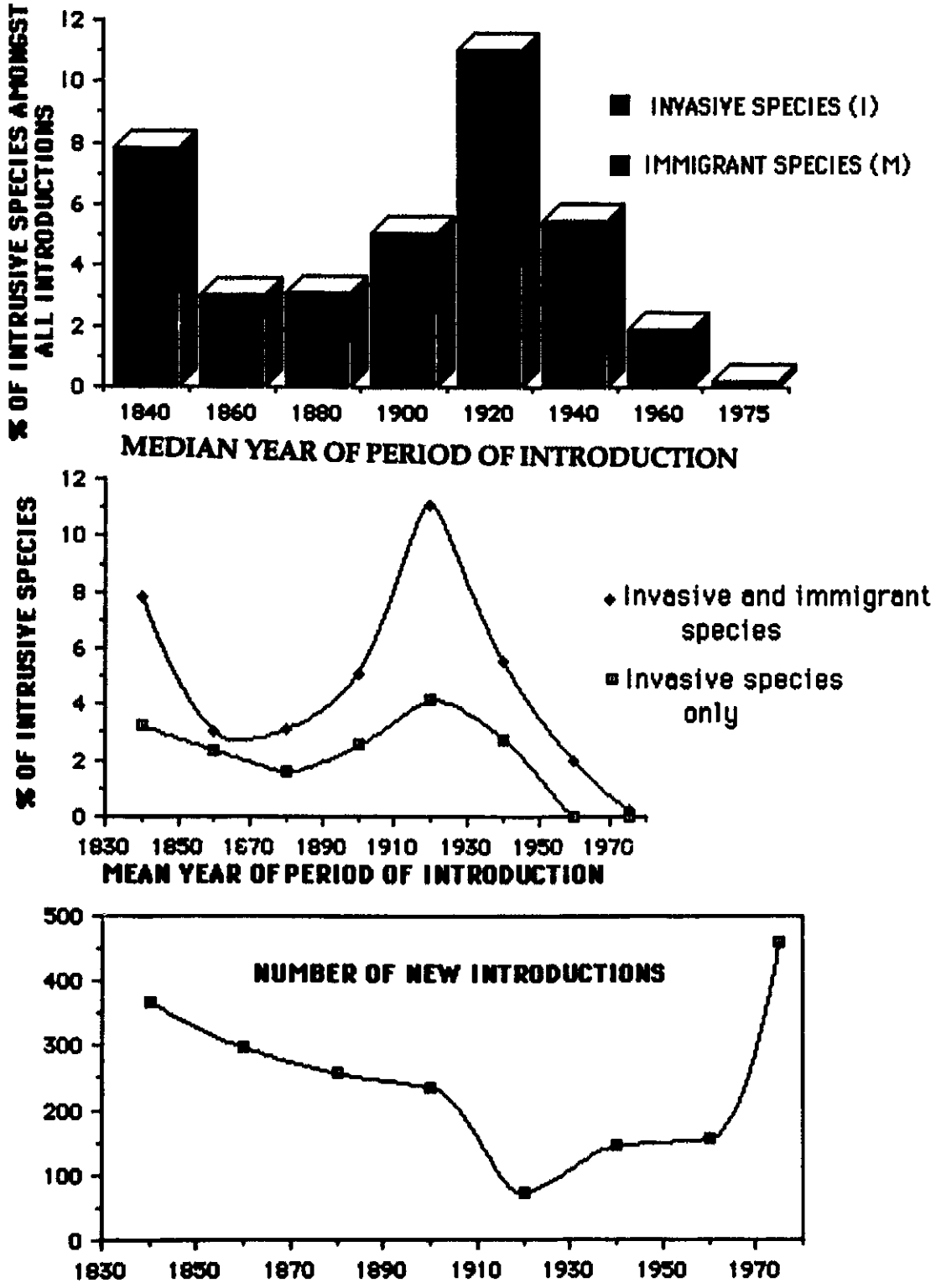

THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE NUMBER OF PLANTINGS IN THE CANBERRA REGION
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
PERCENTAGE OF INTRUSIVE SPECIES AMONGST ALL INTRODUCTIONS
30
20
10
0
CATALOGUE RECORD ONLY
7
32
76
179
524
1484
10000
MEAN AMOUNT OF PLANTINGS OF ALL SPECIES PLACED INTO 8 GROUPINGS
LOGARITHMIC REGRESSIONS OF DATA
I + M
y = 0.62995 + 1.0698e-3x R 2 = 0.967
(P < 0.001)
I
y = 1.3695 + 2.3536e-3x R2 = 0.964
(P < 0.001)
% OF INTRUSIVE SPECIES
.1
1
10
100
1000
10000
600
500
400
300
200
100
(CATALOGUE RECORD ONLY)
NUMBER OF SPECIES IN EACH GROUPING
NO. OF SPECIES
0
10
100
1000
10000
MEAN NUMBER OF GROUPING ACCORDING TO AMOUNT OF PLANTING

Figure 4.2

THE PROBABILITY OF A PLANT BEING INTRUSIVE, IN RELATION TO THE PERIOD IT WAS FIRST INTRODUCED TO THE CANBERRA AREA



relates to the fact that species introduced during this period were planted in large numbers, and came from areas with climates similar to that of Canberra (see Chapter 5.2). If this peak is ignored, there does seem to be a trend suggesting that the earlier a plant is introduced, the more likely it is to have become intrusive.

In figure 4.3, the relationship between introduction pressure and intrusiveness is shown. In this graph the previous variables of time and number of plantings have been combined. This was done by giving each period a group number (P), such that 1830-1850 = 8, and 1971-1985 = 1, and then multiplying this figure by the group number (N), which was allocated according to the quantity of planting. As the number planted was the variable that best correlated with intrusiveness , it was given more importance through the following equation:

Introduction pressure (IP) = 2(N) x P

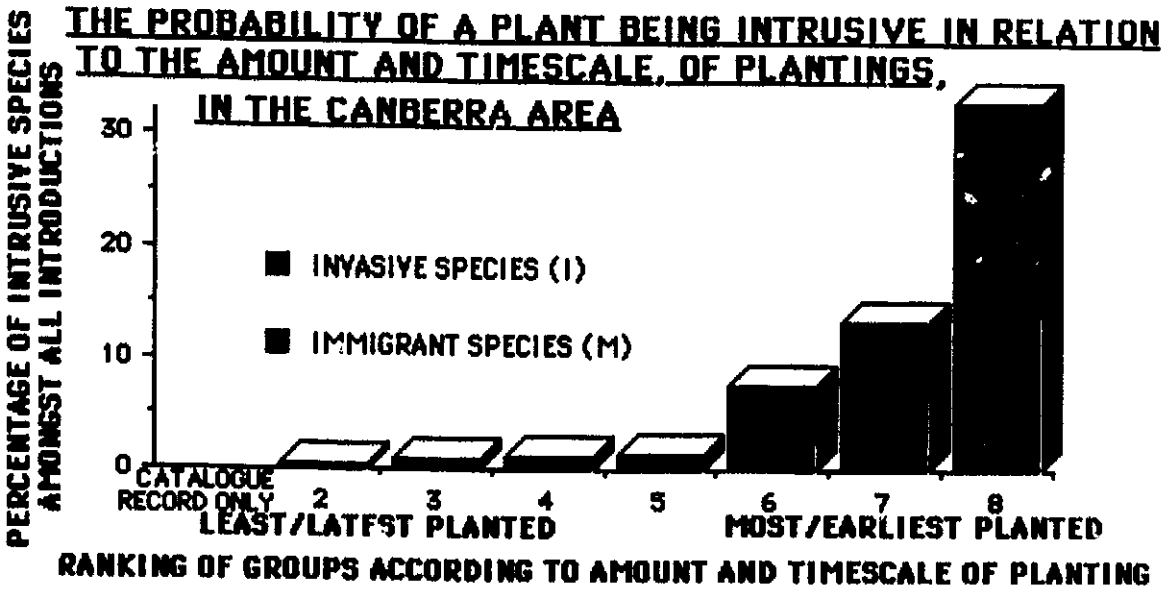
Again a highly significant relationship ($P<0.001$) is evident. However, comparison of figures 4.1 and 4.3 illustrates that combining the factors adds little to the precision found when considering only number of plantings as an individual factor.

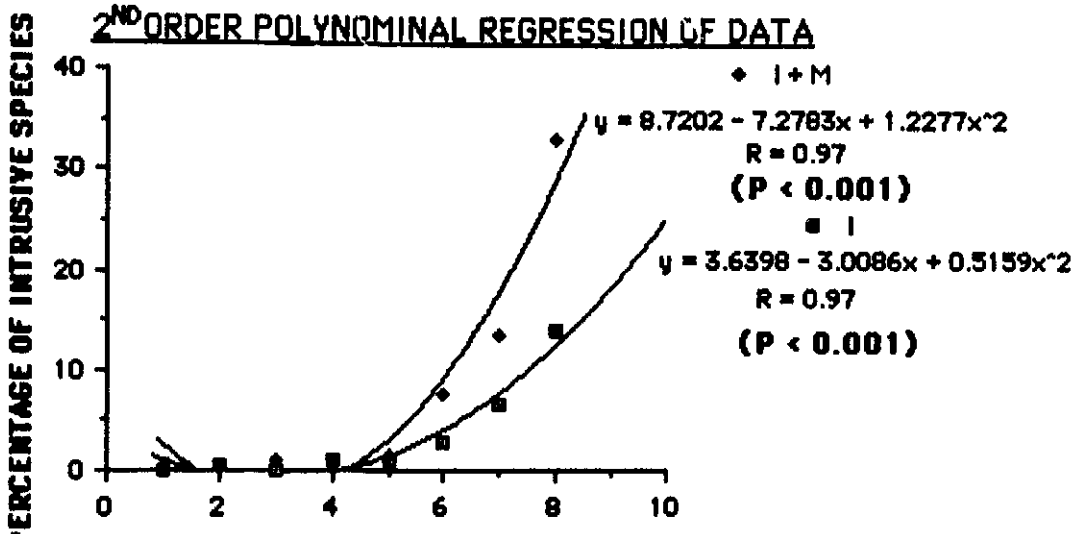
4.4 Adelaide, Melbourne and Sydney

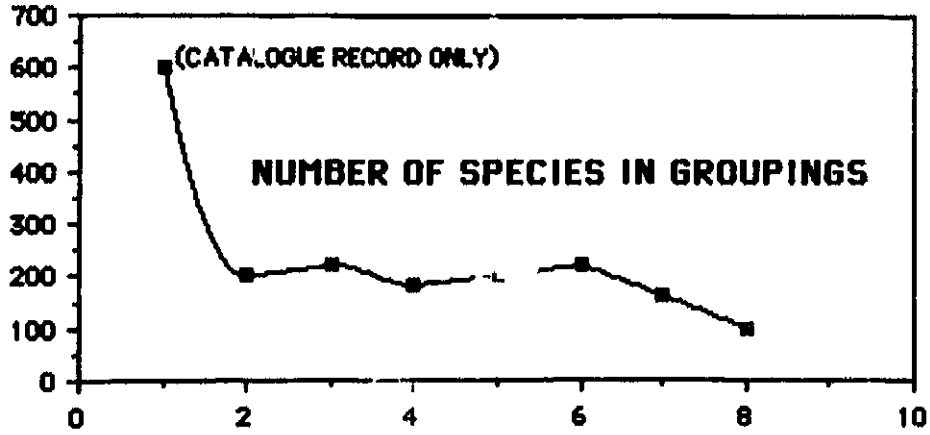
In these cities, private nurseries have been the largest handlers of introduced ornamental plants, and their activity is documented by surviving catalogues and stock lists. A full list of nursery catalogues studied is given in appendices 1 - 3. Catalogues indicate the period when a species was first sold, and hence, probably when the first extensive plantings of a species occurred. Catalogues cannot provide direct information on the numbers of a particular plant sold. Despite this limitation, it is probably a reasonable assumption that a species listed in a large number of catalogues would have been planted more than a species listed in just one or a few catalogues. A full discussion on the reliability of catalogues as historical evidence was presented in chapter 2.1.

For each of the three cities, graphs (figures 4.4 - 4.12) have been prepared that show the relationship between intrusiveness and:

Figure 4.3


THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE AMOUNT AND TIMESCALE, OF PLANTINGS, IN THE CANBERRA AREA
PERCENTAGE OF INTRUSIVE SPECIES AMONGST ALL INTRODUCTIONS
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
CATALOGUE RECORD ONLY
LEAST/LATEST PLANTED
MOST/EARLIEST PLANTED
RANKING OF GROUPS ACCORDING TO AMOUNT AND TIMESCALE OF PLANTING


2ND ORDER POLYNOMINAL REGRESSION OF DATA
PERCENTAGE OF INTRUSIVE SPECIES
I+M
y = 8.7202 - 7.2783x + 1.2277x^2
R = 0.97
(P < 0.001)
I
y = 3.6398 - 3.0086x + 0.5159x^2
R = 0.97
(P < 0.001)


(CATALOGUE RECORD ONLY)
NUMBER OF SPECIES IN GROUPINGS

- number of catalogue listings;
- time of first listing; and
- these two factors combined.

Total listings, as a measure of a plant's numerical popularity, are not independent of historical influence, because to attain a very high number of listings a species must be present in early catalogues. There are, however, so many species introduced early, which were never popular plantings, that when tested there is no statistical correlation between the two variables of total and first listings.

In figures 4.6, 4.9 and 4.12 these two variables were combined using the following equation.

Introduction Pressure = (N - n) x (10 + Y)

N = total number of catalogues
n = actual number of times a species is listed
Y = Catalogue number shown in appendices 1 -3, which are arranged sequentially according to the date the catalogue was published i.e for Sydney 1=1800, 23=1902, 49=1982.

In all three cities, for both the variables, when treated separately or together, there were highly significant relationships, with the likelihood of a species being intrusive. The more often, and the earlier, a plant is listed in nursery catalogues, the more likely it is to be an intrusive species. Combining the factors added little to the precision of that found when considering only the total number of listings as a single factor.

The data obtained suggests that few intrusive species will eventuate from those species maintained at a low level of introduction pressure.

The one exception to this statement occurs in Adelaide, where, for species introduced after 1940, there is an uncharacteristically high proportion (approx. 4%), of immigrant species. These 4% of recently introduced species are all Australian natives, that are spreading in one or more of the following three areas: the "Flora Reserve" Belair Recreation Park;

Figure 4.4

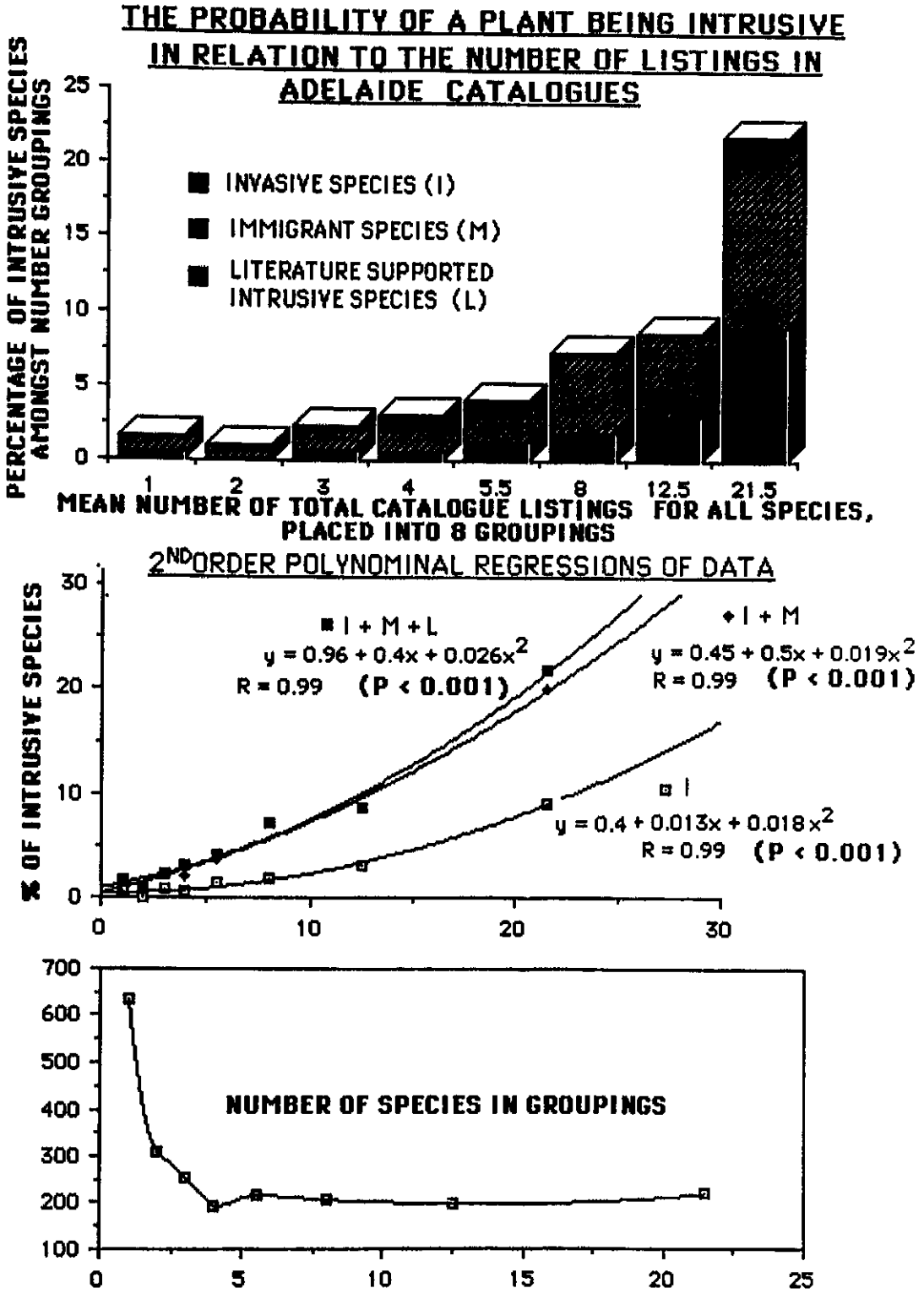

THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE NUMBER OF LISTINGS IN ADELAIDE CATALOGUES
PERCENTAGE OF INTRUSIVE SPECIES AMONGST NUMBER GROUPINGS
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
LITERATURE SUPPORTED INTRUSIVE SPECIES (L)
MEAN NUMBER OF TOTAL CATALOGUE LISTINGS FOR ALL SPECIES, PLACED INTO 8 GROUPINGS
2ND ORDER POLYNOMINAL REGRESSIONS OF DATA
% OF INTRUSIVE SPECIES
I + M + L
y = 0.96 + 0.4x + 0.026x2
R = 0.99 (P < 0.001)
I + M
y = 0.45 + 0.5x + 0.019x2
R = 0.99 (P < 0.001)
I
y = 0.4 + 0.013x + 0.018x2
R = 0.99 (P < 0.001)
NUMBER OF SPECIES IN GROUPINGS

Figure 4.5

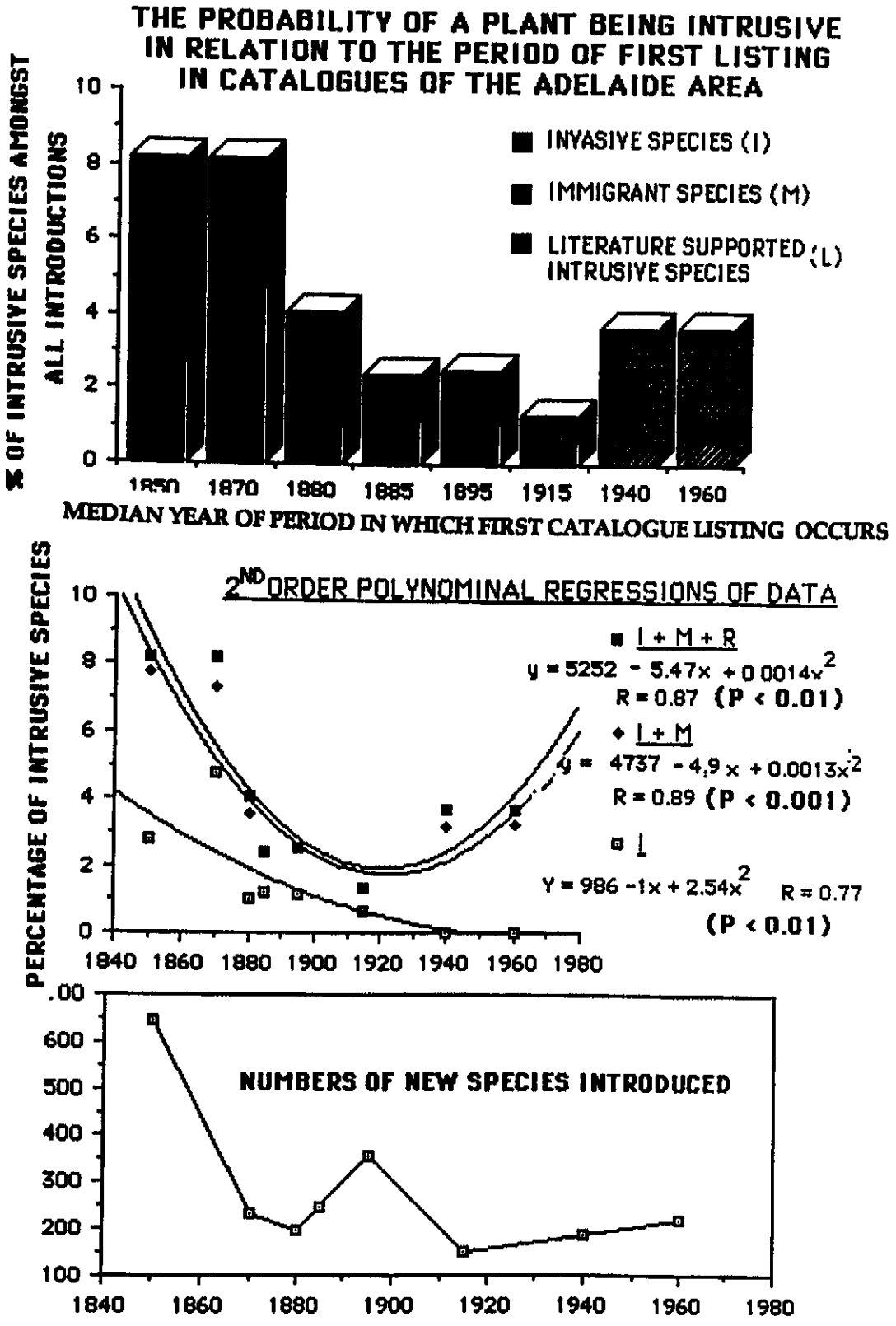

THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE PERIOD OF FIRST LISTING IN CATALOGUES OF THE ADELAIDE AREA
% OF INTRUSIVE SPECIES AMONGST ALL INTRODUCTIONS
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
LITERATURE SUPPORTED INTRUSIVE SPECIES (L)
0
2
4
6
8
10
1850
1870
1880
1885
1895
1915
1940
1960
MEDIAN YEAR OF PERIOD IN WHICH FIRST CATALOGUE LISTING OCCURS
PERCENTAGE OF INTRUSIVE SPECIES
2ND ORDER POLYNOMINAL REGRESSIONS OF DATA
I + M + R
y = 5252 - 5.47x + 0.0014x2
R = 0.87 (P < 0.01)
I + M
y = 4737 - 4.9x + 0.0013x2
R = 0.89 (P < 0.001)
I
Y = 986 - 1x + 2.54x2
R = 0.77
(P < 0.01)
0
2
4
6
8
10
1840
1860
1880
1900
1920
1940
1960
1980
NUMBERS OF NEW SPECIES INTRODUCED
100
200
300
400
500
600
.00
1840
1860
1880
1900
1920
1940
1960
1980

Figure 4.6

THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE NUMBER AND TIMESCALE, OF LISTINGS IN ADELAIDE CATALOGUES

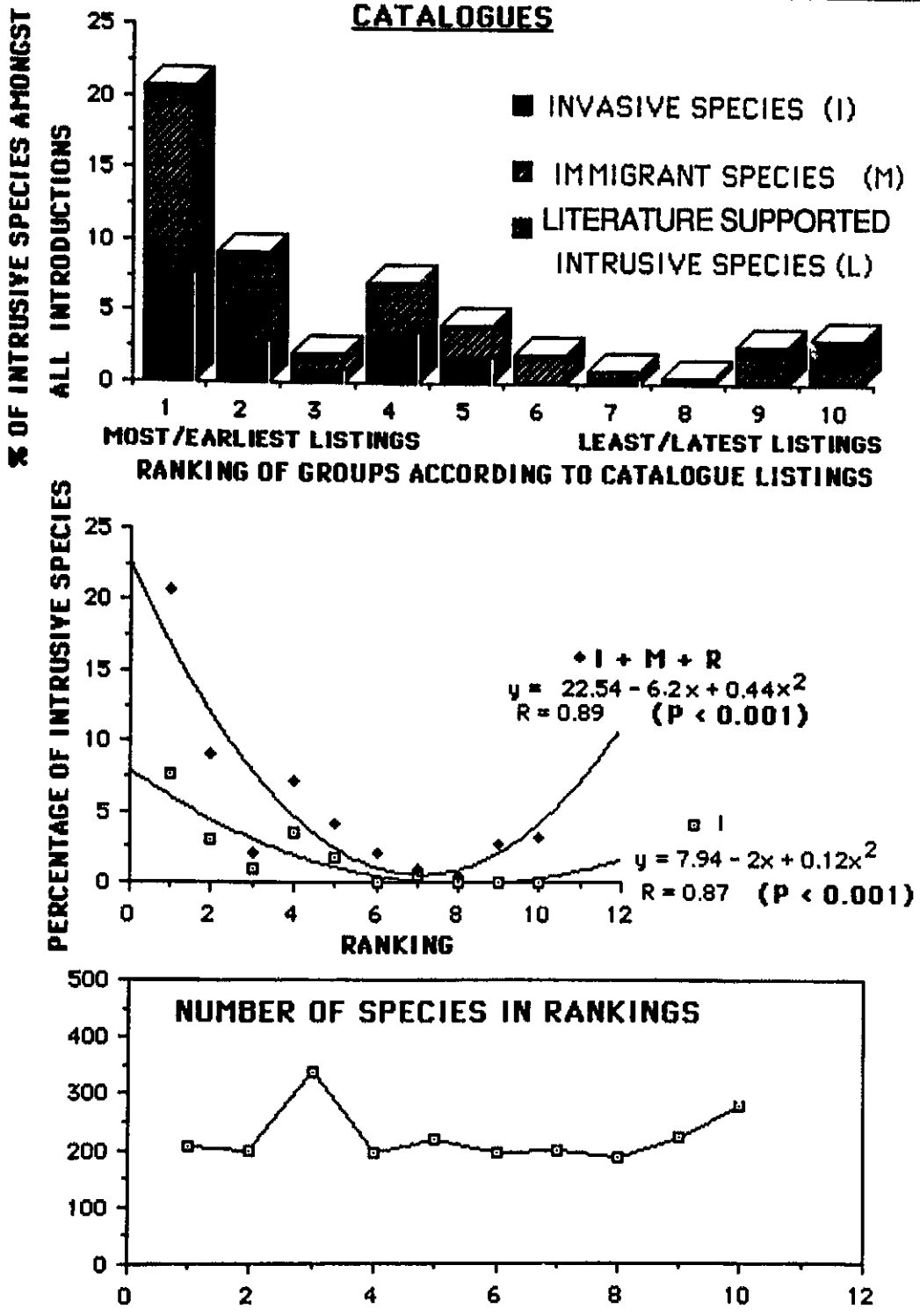


Figure 4.7

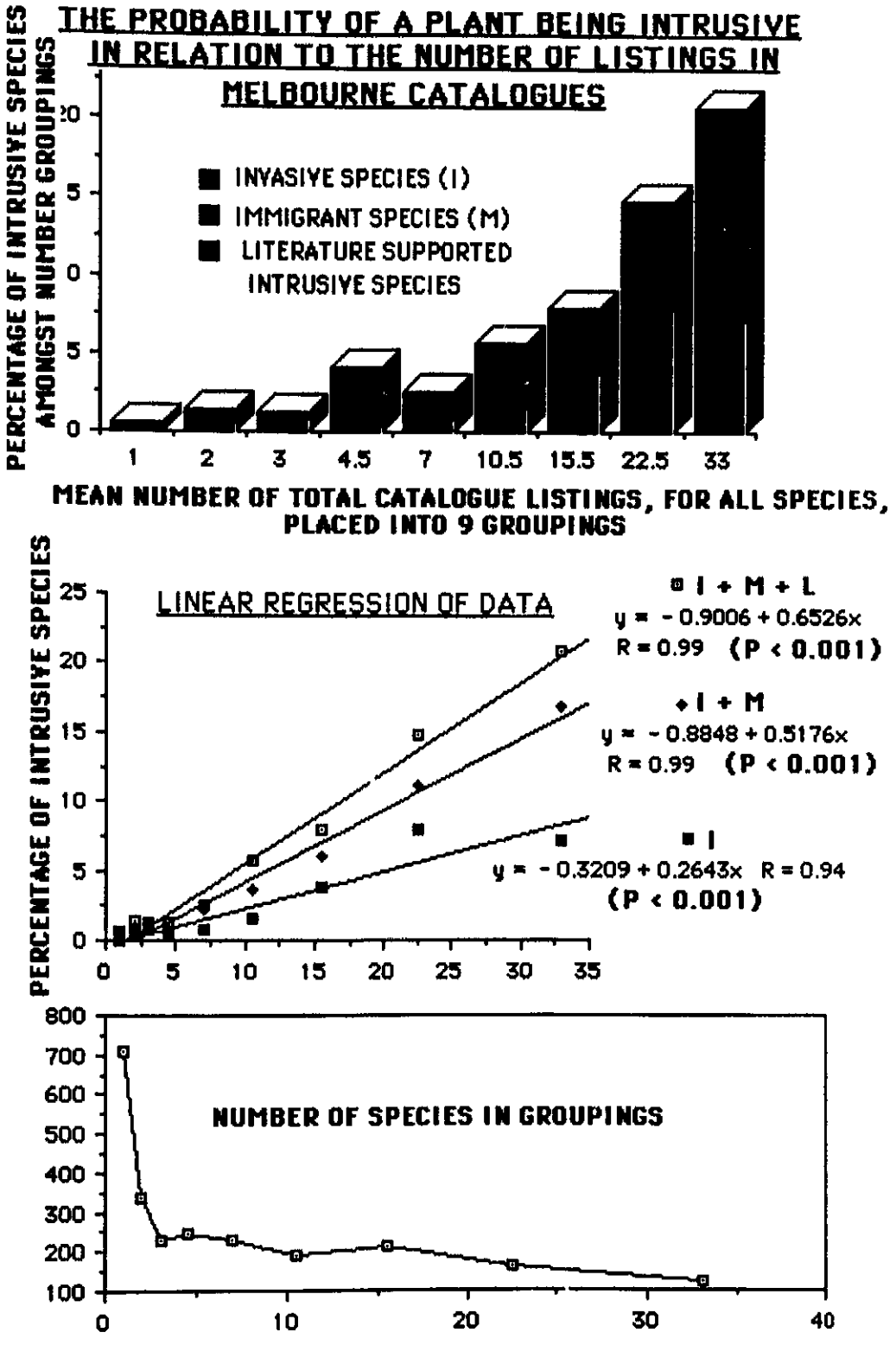

THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE NUMBER OF LISTINGS IN MELBOURNE CATALOGUES
PERCENTAGE OF INTRUSIVE SPECIES AMONGST NUMBER GROUPINGS
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
LITERATURE SUPPORTED INTRUSIVE SPECIES
0
5
0
5
10
1
2
3
4.5
7
10.5
15.5
22.5
33
MEAN NUMBER OF TOTAL CATALOGUE LISTINGS, FOR ALL SPECIES, PLACED INTO 9 GROUPINGS
PERCENTAGE OF INTRUSIVE SPECIES
LINEAR REGRESSION OF DATA
I + M + L
y = - 0.9006 + 0.6526x
R = 0.99 (P < 0.001)
I + M
y = - 0.8848 + 0.5176x
R = 0.99 (P < 0.001)
I
y = - 0.3209 + 0.2643x R = 0.94
(P < 0.001)
0
5
10
15
20
25
30
35
NUMBER OF SPECIES IN GROUPINGS
100
200
300
400
500
600
700
800
0
10
20
30
40

Figure 4.8

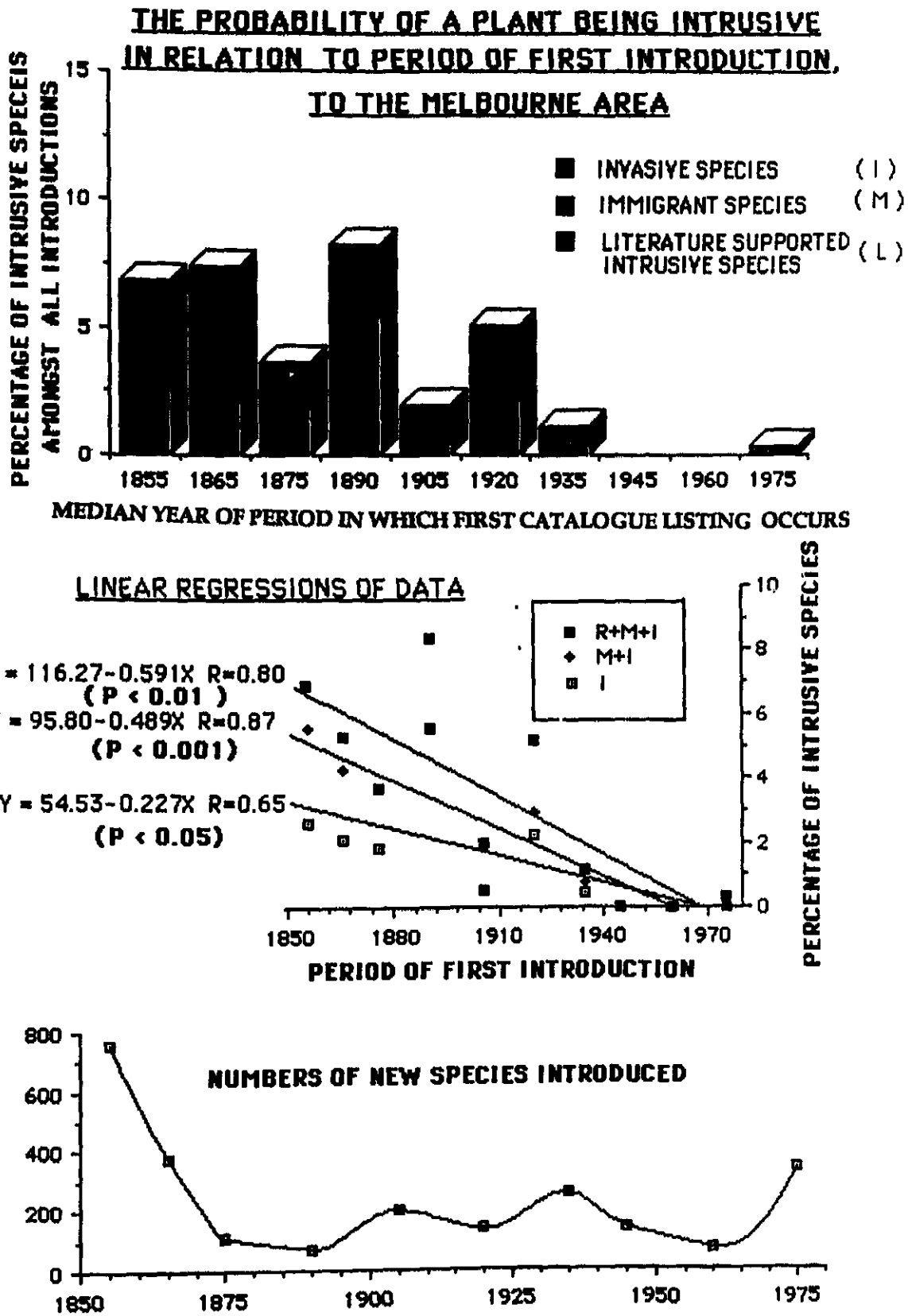

THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO PERIOD OF FIRST INTRODUCTION, TO THE MELBOURNE AREA
PERCENTAGE OF INTRUSIVE SPECIES AMONGST ALL INTRODUCTIONS
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
LITERATURE SUPPORTED INTRUSIVE SPECIES (L)
0
5
10
15
1855 1865 1875 1890 1905 1920 1935 1945 1960 1975
MEDIAN YEAR OF PERIOD IN WHICH FIRST CATALOGUE LISTING OCCURS
LINEAR REGRESSIONS OF DATA
Y = 116.27-0.591X R=0.80
(P < 0.01)
Y = 95.80-0.489X R=0.87
(P < 0.001)
Y = 54.53-0.227X R=0.65
(P < 0.05)
R+M+I
M+I
I
0
2
4
6
8
10
1850 1880 1910 1940 1970
PERIOD OF FIRST INTRODUCTION
PERCENTAGE OF INTRUSIVE SPECIES
NUMBERS OF NEW SPECIES INTRODUCED
0
200
400
600
800
1850 1875 1900 1925 1950 1975

Figure 4.9

THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE NUMBER AND TIME SCALE, OF LISTINGS IN MELBOURNE CATALOGUES

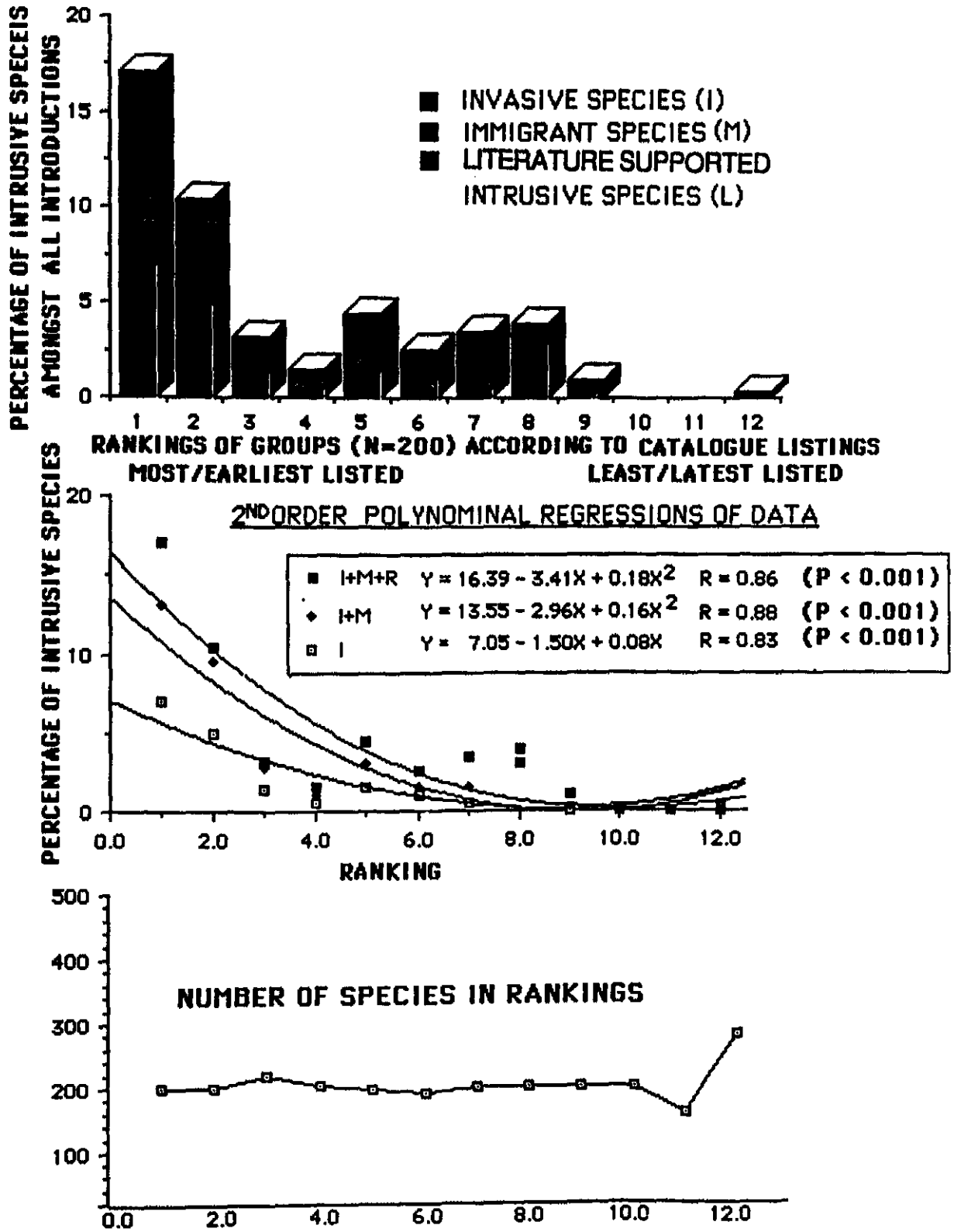
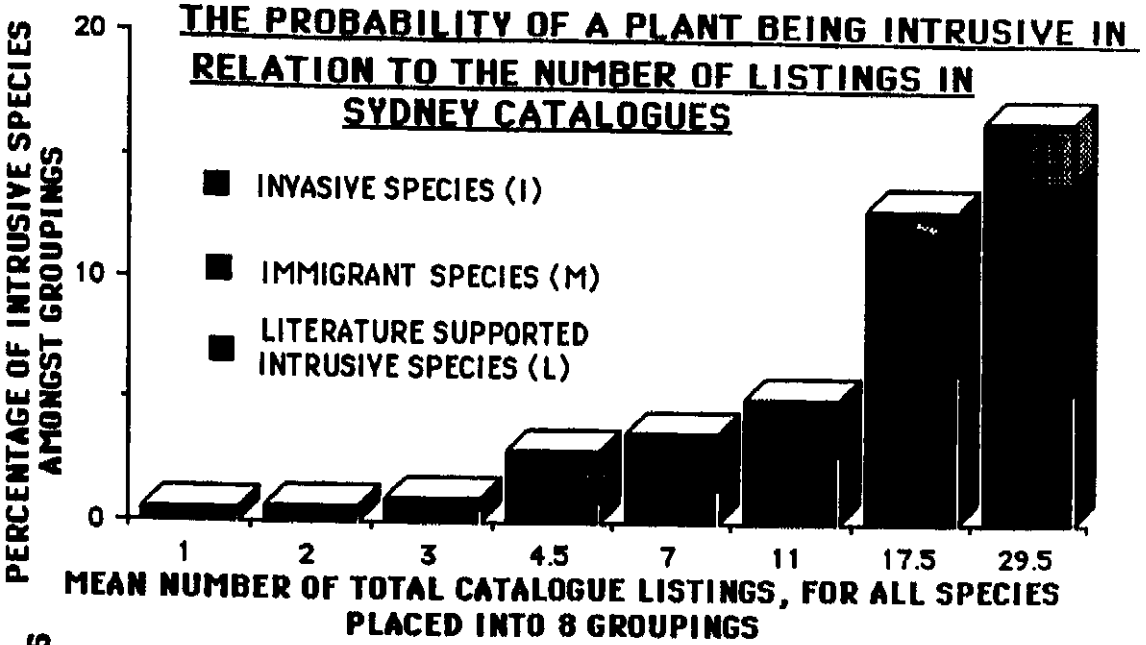
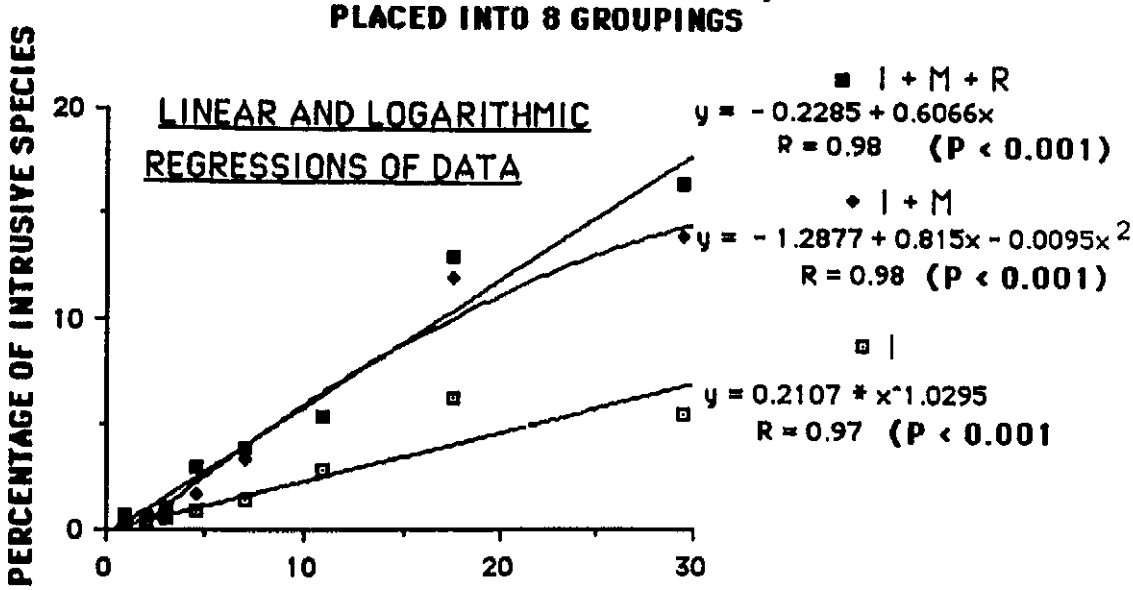


Figure 4.10


THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE NUMBER OF LISTINGS IN SYDNEY CATALOGUES
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
LITERATURE SUPPORTED INTRUSIVE SPECIES (L)
PERCENTAGE OF INTRUSIVE SPECIES AMONGST GROUPINGS
20
10
0
1
2
3
4.5
7
11
17.5
29.5
MEAN NUMBER OF TOTAL CATALOGUE LISTINGS, FOR ALL SPECIES PLACED INTO 8 GROUPINGS


PERCENTAGE OF INTRUSIVE SPECIES
LINEAR AND LOGARITHMIC REGRESSIONS OF DATA
■ I + M + R
y = - 0.2285 + 0.6066x
R = 0.98 (P < 0.001)
◆ I + M
y = - 1.2877 + 0.815x - 0.0095x^2
R = 0.98 (P < 0.001)
□ I
y = 0.2107 * x^1.0295
R = 0.97 (P < 0.001
20
10
0
0
10
20
30

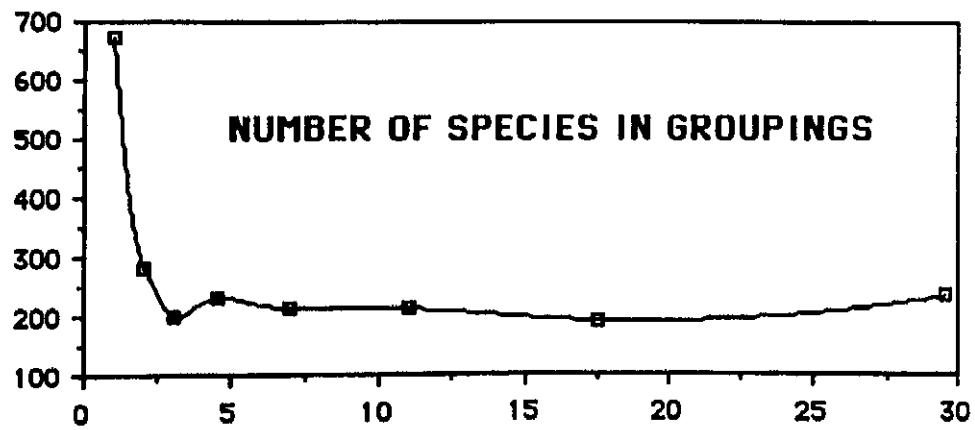

NUMBER OF SPECIES IN GROUPINGS
700
600
500
400
300
200
100
0
5
10
15
20
25
30

Figure 4.11

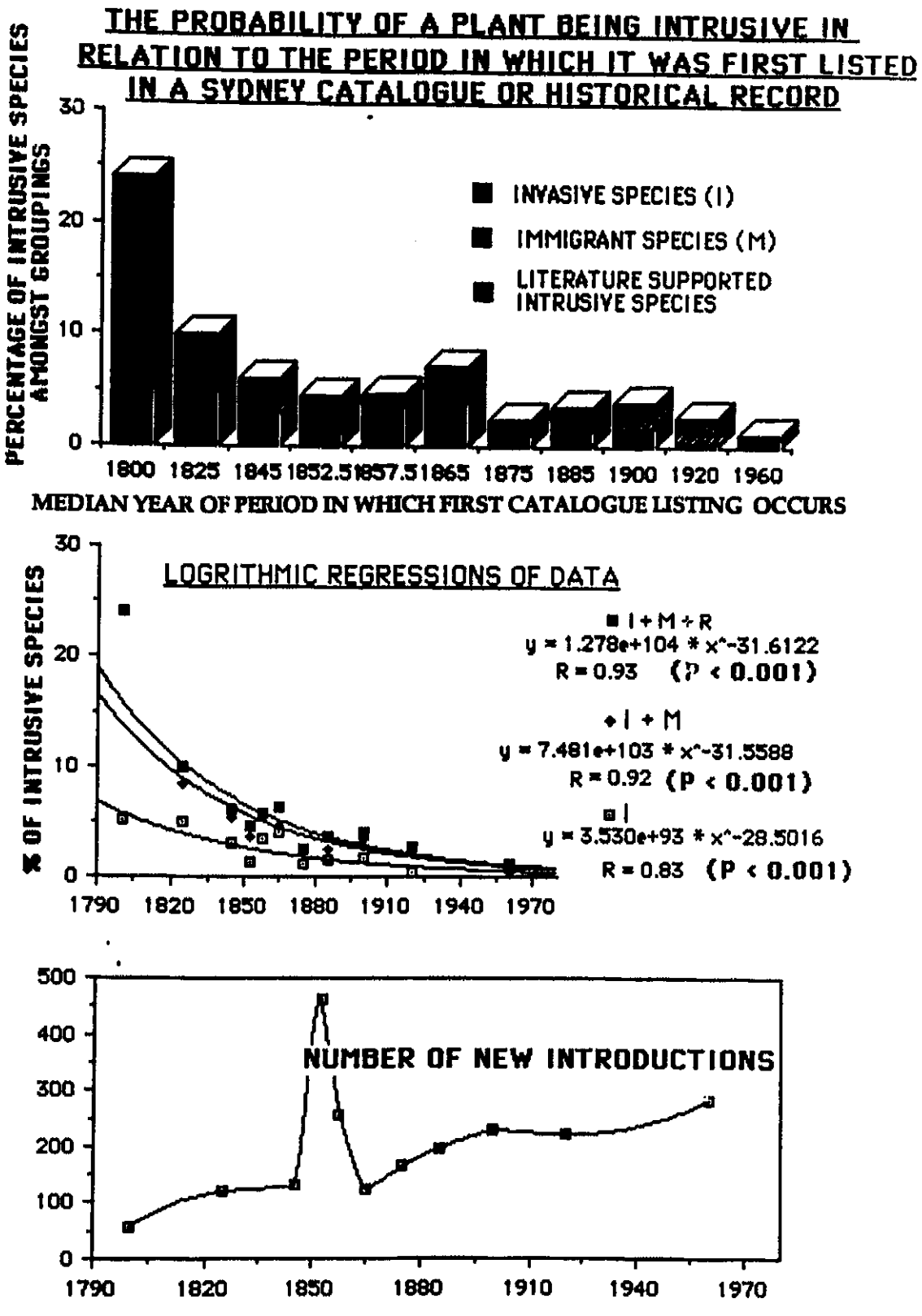
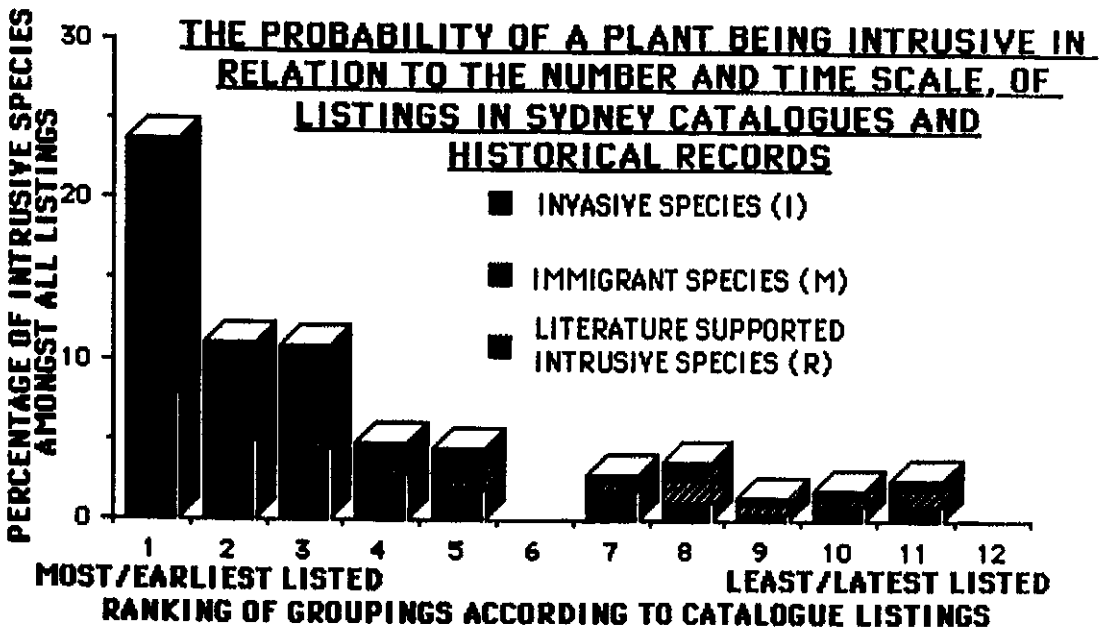
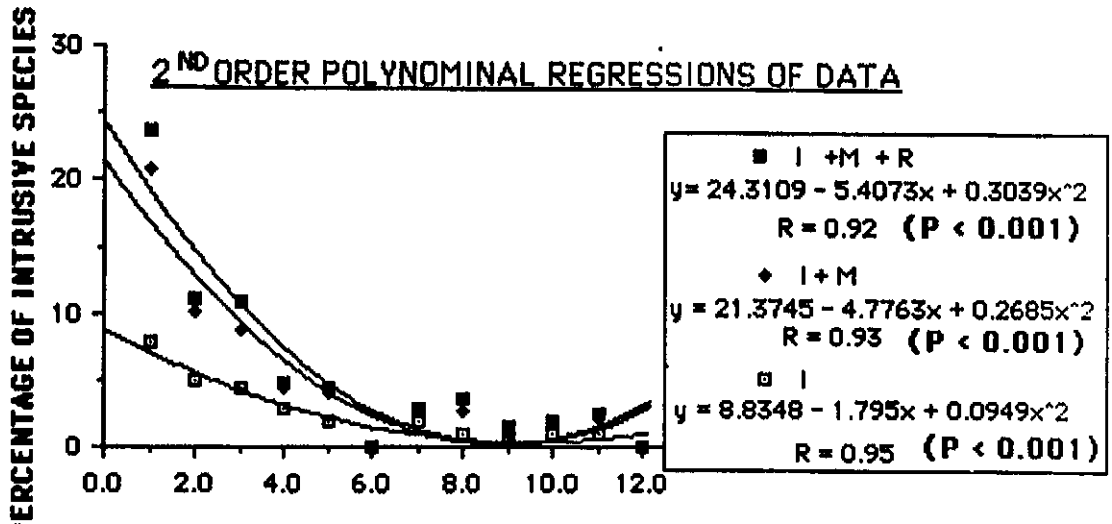
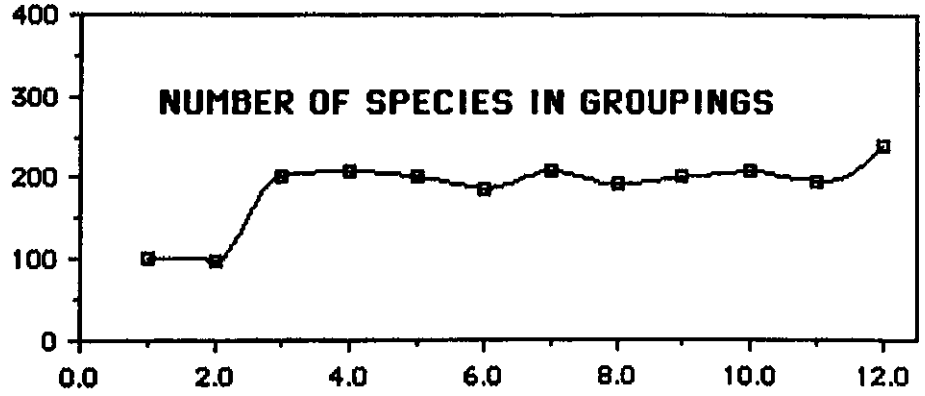

THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE PERIOD IN WHICH IT WAS FIRST LISTED IN A SYDNEY CATALOGUE OR HISTORICAL RECORD
PERCENTAGE OF INTRUSIVE SPECIES AMONGST GROUPINGS
30
20
10
0
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
LITERATURE SUPPORTED INTRUSIVE SPECIES
1800 1825 1845 1852.5 1857.5 1865 1875 1885 1900 1920 1960
MEDIAN YEAR OF PERIOD IN WHICH FIRST CATALOGUE LISTING OCCURS
LOGRITHMIC REGRESSIONS OF DATA
% OF INTRUSIVE SPECIES
I + M ÷ R
y = 1.278e+104 * x^-31.6122
R = 0.93 (P < 0.001)
I + M
y = 7.481e+103 * x^-31.5588
R = 0.92 (P < 0.001)
I
y = 3.530e+93 * x^-28.5016
R = 0.83 (P < 0.001)
1790 1820 1850 1880 1910 1940 1970
500
400
300
200
100
0
NUMBER OF NEW INTRODUCTIONS
1790 1820 1850 1880 1910 1940 1970

Figure 4.12


THE PROBABILITY OF A PLANT BEING INTRUSIVE IN RELATION TO THE NUMBER AND TIME SCALE, OF LISTINGS IN SYDNEY CATALOGUES AND HISTORICAL RECORDS
INVASIVE SPECIES (I)
IMMIGRANT SPECIES (M)
LITERATURE SUPPORTED INTRUSIVE SPECIES (R)
PERCENTAGE OF INTRUSIVE SPECIES AMONGST ALL LISTINGS
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12
MOST/EARLIEST LISTED
LEAST/LATEST LISTED
RANKING OF GROUPINGS ACCORDING TO CATALOGUE LISTINGS


2ND ORDER POLYNOMINAL REGRESSIONS OF DATA
PERCENTAGE OF INTRUSIVE SPECIES
30
20
10
0
0.0 2.0 4.0 6.0 8.0 10.0 12.0
I +M + R
y= 24.3109 - 5.4073x + 0.3039x^2
R = 0.92 (P < 0.001)
I + M
y = 21.3745 - 4.7763x + 0.2685x^2
R = 0.93 (P < 0.001)
I
y = 8.8348 - 1.795x + 0.0949x^2
R = 0.95 (P < 0.001)


NUMBER OF SPECIES IN GROUPINGS
400
300
200
100
0
0.0 2.0 4.0 6.0 8.0 10.0 12.0

Watiparinga Reserve; or Fergusson Recreation Park. During the 1940s until the 1970s these areas were all planted with non-local Australian plants, by the South Australian Field Naturalists, The Society for Growing Australian Plants, The South Australian Tourist Bureau, or by the proprietor of Fergusson Park, 1926-1944, Alexander Melrose (Preiss 1980, Robertson 1984, and Robertson personal communication 1987). These plantings were intermingled with and placed amongst remnant patches of indigenous vegetation. These species have, therefore, had excellent opportunity to spread. Thus, not only does it seem that timing and quantity of planting are important to whether a plant has become intrusive, but the positioning of planting also may be vital.

It is of interest to note that none of these Adelaide species has become invasive yet, and that in all four of the different cities there are virtually no invasive species that were not listed in a catalogue before 1940 (see figures 4.2, 4.5, 4.8, 4.11). Perhaps because woody species, in comparison to herbs, have low rates of population growth, it may take decades for a garden escapee to become so common in an invaded area that it dominates it. If this is true, then weed officers should be particularly wary of recently introduced immigrant species. Thus immigrant plants of *Pelargonium X domesticum*, a species that arrived on the First Fleet, are likely to be less of a threat than immigrant plants new to horticulture, such as *Acacia iteaphylla*. Similarly, one would expect, that of those species that have had a large introduction pressure and opportunity to spread, but have failed to do so, few will become invasive. However, this reasoning assumes that future changes in landuse or the local environment will not create new habitats suitable to unintrusive species with large introduction pressures, such as *Pelargonium X domesticum*.

4.5 The nature of the relationships identified.

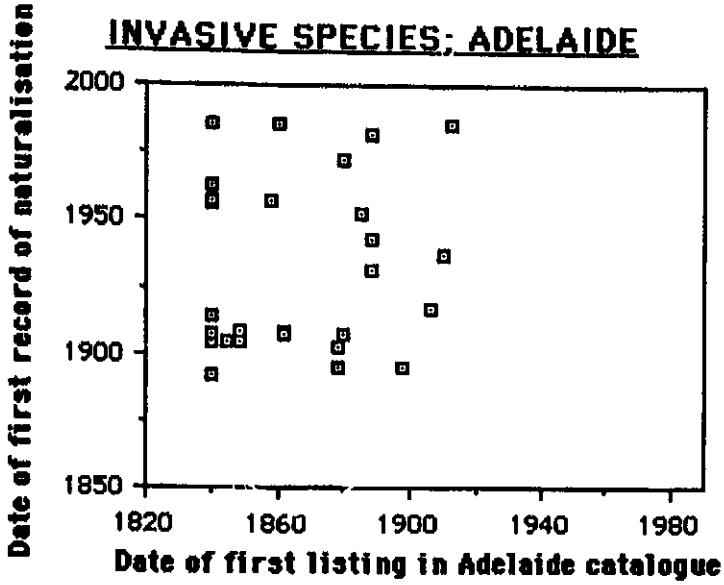
Kloot (1986) prepared a check list of naturalised species in South Australia, which includes the date when a species was first collected as a naturalised plant. Most of the woody species listed were first collected in the Adelaide area. For those that were not I have assumed that planting in other parts of South Australia resembled the pattern in the Adelaide area. Kloot's data thus allows an examination of the relationship between intrusiveness and introduction pressure, in a historical context. It should be born in mind that

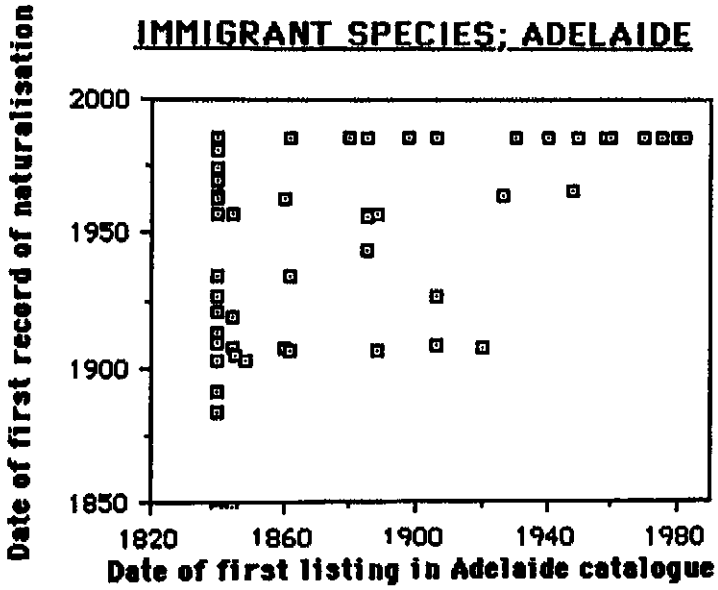
the naturalisations listed by Kloot are not restricted to establishment in indigenous vegetation, though many of the first collections may have been in natural bush. In figure 4.13, the date when a species was first listed in an Adelaide catalogue, is plotted against the date when it was first collected as naturalised. As is evident, there is no relationship between time of introduction and time of first recorded naturalisation.

In figure 4.14, the date of first recorded naturalisation is plotted against the date when a species became a frequent listing. A frequent listing is one in which the species occurs in 75% or more, of the catalogues during a particular decade. About 30% of all intrusive species were never frequent listings. For the remaining species, again no relationship was found between the variables being tested. The graphs do suggest, however, that few woody species became naturalised before 1900, which supports the claim made earlier, that there is likely to be a considerable timelag between introduction and invasion. It should be born in mind, however, that collecting of plant specimens gained impetus in South Australia after 1900.

Pickard (1984) prepared a similar list for Lord Howe Island to that of Kloot. Lord Howe Island lies in an isolated position 670km north-east of Sydney. It was first settled in the 1830s, and since that time, its main trade, source of supplies, and administration has been from and with Sydney. This has been particularly dominant since the late 1880s, because before that date, passing whaling vessels were of importance to the island's economy (Nicholls 1952, p97, Pickard 1984). In terms of woody plant introduction, the early settlers, like the first white invaders of Sydney, needed to be self sufficient, and early introductions correspond well with the fruit trees grown in Sydney (Rabone 1940 p24, Nicholls 1952 p97); Two Sydney administrators, the botanist J.H. Maiden, and the Forest Ranger-cum-Registrar/Postmaster, P.R. Armstrong, are accredited with introducing ornamental plants to Lord Howe (Rabone 1940 p41, Pickard 1984); And through trade in seed of the Kentia Palm, islanders had, at various stages, close contacts with Sydney nurseries (Nicholls 1952 p103-108). Sydney was undoubtedly the immediate source of most plants introduced to Lord Howe Island.

Figure 4.13
TIME OF FIRST CATALOGUE LISTING V'S TIME OF NATURALISATION

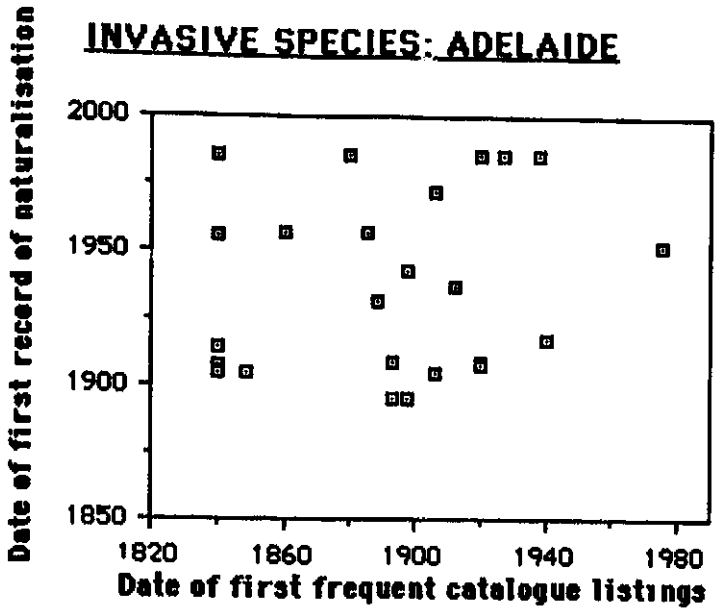


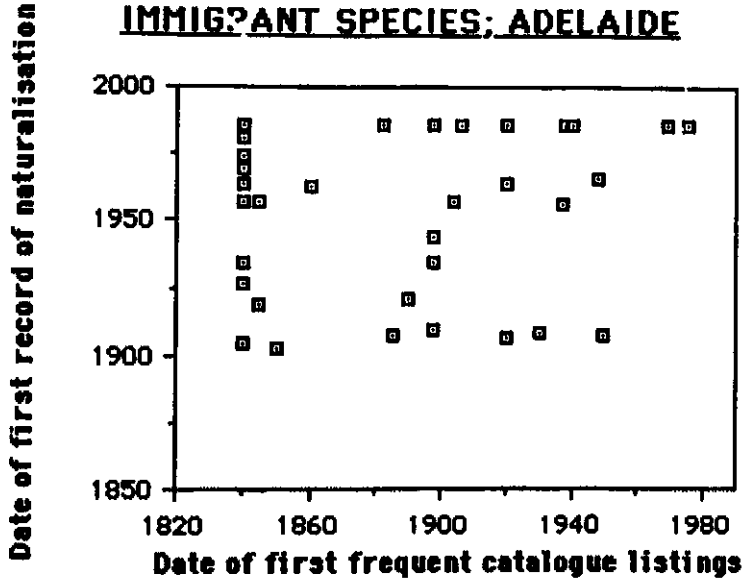


NOTE: Data partly after Kloot (1986).

Figure 4.14

TIME OF FIRST FREQUENT LISTINGS V'S TIME OF NATURALISATION





NOTE: Data partly after kloot (1986)

Though it is spurious to assume that species first planted or popular during a certain period in Sydney, also would have been first planted or popular in Lord Howe Island during the same period, there may be an element of truth in the assumption. It is interesting to note that of the thirty-three naturalised woody ornamental species listed by Pickard, twenty-two (66%), are amongst the 400 most listed in Sydney catalogues. Perhaps this provides further confirmation of the relationship between intrusiveness and number of plantings. In figure 4.15, I have treated Pickard's data in the same way as Kloot's, but this time comparing it against the Sydney record. Again no relationship is apparent. Figure 4.15 gives the impression that there were two periods of naturalisation, 1890-1900, and after 1950. These are actually the periods when most of the plant collecting occurred (Pickard 1984, fig 13).

4.6 Conclusions.

In all cases studied the quantity that a species was planted, or assumed to be planted, strongly correlates with the likelihood of that plant being intrusive. The length of time since a species was first introduced also correlates with intrusiveness. Species that have been planted in large numbers over a considerable length of time are most likely to be intrusive, a relationship particularly strong for immigrant species.

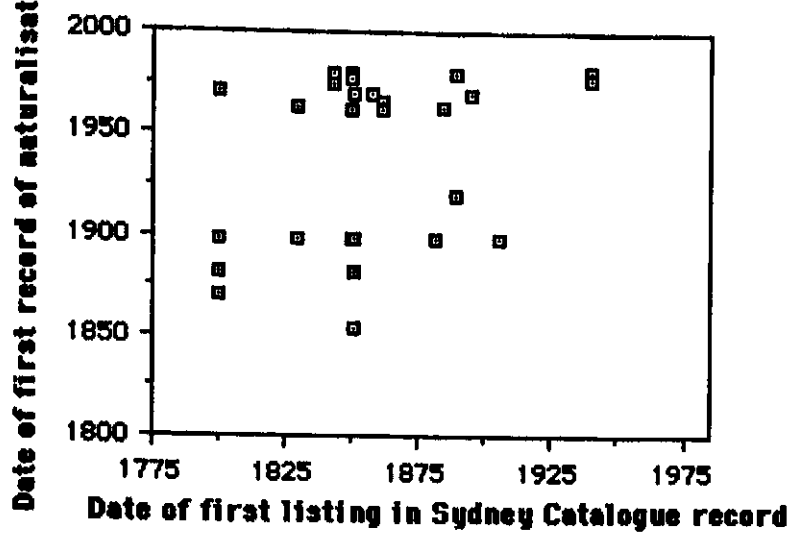
The period in which a species first becomes intrusive is not, however, correlated with its planting record: many species, introduced and frequently planted at later periods of time, become naturalised before those introduced and popularly planted much earlier. This unpredictability probably reflects the element of chance associated with establishment, and a warning that introduction pressure is not the only factor determining intrusiveness.

4.7 Consequences of findings

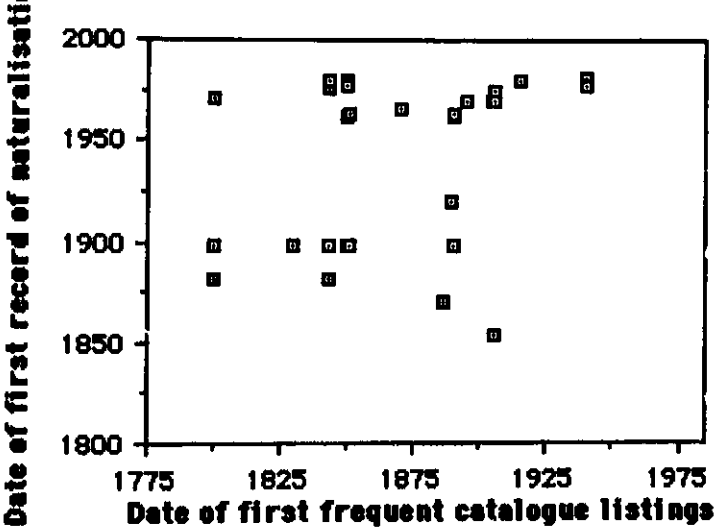
Correlations do not imply causation, and this is important when deciding what the derived conclusions mean. It is possible, for example, that the species were planted in large numbers because they were hardy, easily propagated, and/or had a large floral or fruiting (propagule) display, and it was these features that were responsible for their intrusiveness, rather than

Figure 4.15

THE RELATIONSHIP BETWEEN TIME OF INTRODUCTION AND TIME OF NATURALISATION: LORD HOWE ISLAND



THE RELATIONSHIP BETWEEN TIME OF FIRST POPULAR PLANTING AND TIME OF NATURALISATION; LORD HOWE ISLAND



NOTE: Data partly after Pickard 1984

introduction pressure. Similarly the correlation with time simply might reflect advances in transportation, with early introductions being restricted to those plants that could survive several months at sea, while later introductions could include less resilient plants.

The central aim of this thesis is to identify intrusive from non-intrusive plants, and what is therefore important is that the correlation between introduction pressure and intrusiveness, does this quite well, irrespective of whether or not it is due to a direct interaction. The strength of the correlations obtained across all of the cities studied, together with the theoretical considerations and other cases discussed, suggests however, that introduction pressure is of importance to intrusiveness. Certainly many other studies would have benefited from an examination of introduction effects. Ehrlich (1986) in discussing why the House Sparrow (*Passer domesticus*) is a more successful invader than the Tree Sparrow (*P. montanus*), mentions such things as genetic bottlenecks, parasite load, body size, competition between the two, and pure luck, but fails to appreciate that this luck will be affected by the fact that attempts to establish the Tree Sparrow have been few, when compared with the introduction pressure of the House Sparrow (Long 1981 p372). Kloot (1985) provides an example from the plant kingdom. He proposed that the reason few Australian plants have become established in the Middle East, is because that area is so degraded by human activity. It also may be because few Australian plants have been introduced to this region. Indeed the reason that many Australian plants occur in New Zealand and South Africa, seems to be largely because they have been widely planted in both areas (Shaughnessy 1980 p319).

If one assumes that introduction pressure does influence intrusiveness, then much of the make up of South-eastern Australia's woody intrusive flora, may be explained by past planting fashion and fads. Given that species planted in large numbers, over a long time are most likely to be intrusive, it is not surprising to see that fruit and spice trees (14%), creepers (20%), and Australian natives with dark hued leaves (9%), are prominent amongst the 289 intrusive species listed in table 3.1. It is not surprising because, as outlined in Chapter 2.4, these plants have never been out of fashion. In contrast to this are woody ferns (0%), and conifers (4%), which had a brief

surge of popularity during Victorian times. It is no coincidence that of the ten conifers listed in table 3.1, all but one *Juniperus chinensis*, have been recommended for windbreak planting, so that when planted they were likely to have been propagated in large numbers. Hedge plants (23%) probably are prominent also for the same reason.

Although each city does have a unique list of species planted, popular species were usually popular in all cities. Thus the distinctiveness of a city's intrusive flora (table 3.1) probably has little to do with introduction pressure. The exceptions are the proportion of Australian species amongst the lists, and several unique popular plantings in Canberra, such as *Celtis australis* (Nettle tree) and *Sorbus domestica* (Rowan). Sydney nurseries sold few non-local Australian plants, and this is reflected in the low number, eight (6% of all intrusive species), that have become intrusive there. In contrast Canberra has ten (12%), Melbourne has nineteen (17%), and Adelaide has thirty-nine (27%), intrusive non-local Australian species. Given that the latest fashion has seen a substantial increase in the number and range of Australian species grown, one can only agree with Kloot (1985), that Australian natives will figure prominently amongst the intrusive plants in South-eastern Australia, in the future.

It is apparent that degree of planting, through time and space, is an important feature of intrusiveness. Not all species that have been much planted, however, have become intrusive, and there are several intrusive species listed in Table 3.1, that have only been planted sparingly. Introduction pressure is therefore not the only factor involved in intrusiveness. It is such a major influence, however, that in discussing further factors that may influence intrusiveness, only the top 500 of the most and earliest planted species, for each city, will be considered. These species are henceforth termed commonly planted species.

CHAPTER 5: ENVIRONMENTAL DETERMINANTS - ABIOTIC

An explanation why all species with equivalent introduction pressure are not equally invasive may be found through the comparison of their source environments. The hypotheses to be tested are:

1) Intrusive species originate from environments that closely match those into which they are being introduced. (They feel at home in a strange place); and

2) Intrusive plants originate from particular, but not environmentally matched environments (certain environments may select for intrusive traits).

A plant's environment consists of a multitude of physical components, such as climate, soil, and landform, and biotic components such as competition with and predation from other life. The biotic component of the environment will be dealt with in detail in chapter six. Both biotic and abiotic components interact and form a complex interrelated whole. This interaction, and the number of factors involved, mean that no two areas will have identical environments. Therefore, any attempt at environmental comparison requires determination of the key elements which epitomise and classify an area's environment. Numerous environmental classifications exist, but the type and number of elements chosen depend upon both the size of the areas compared and the purpose behind the classification.

In this thesis, classifications have been adopted to build a profile of the environments existing across the natural range of a plant species. This profile is then compared with those areas of South-eastern Australia into which that plant has been introduced. The ability to test the hypotheses firmly hinges on how well the environments of both source and sink areas are characterised, whether these summaries are at an appropriate scale, and on how well known are the natural distributions of the introduced plants.

The natural distributions of only a few of the thousands of plant species introduced into South-eastern Australia are known in any detail. Not only

is there a lack of knowledge where a species occurs, but for many there is doubt about whether its occurrence in an area is due solely to the influence of humans (Tutin et al. 1964 -1976). Most distributions of the woody species introduced to South-eastern Australia have been pieced together using regional floras or from monographs on particular genera. (Distribution references are marked thus **(D)** in the bibliography). In nearly all cases, distributions presented in such sources are based primarily on criteria of presence or absence. Large areas are involved, usually hundreds of square kilometres, and occurrences in them are frequently based on herbarium collections, which have not been received equally from all regions and sometimes include misidentified specimens. The plant distributions used, therefore, are only broad scale approximations to the actual distributions. For such data it is clear that macro-environmental classifications will prove the most appropriate.

5.1 Climatic Classifications

A basic truth of biogeography is that climate is a principal determinant of plant distribution (Trewartha 1968 p240, Good 1964 p364, Cox and Moore 1986 p40). Climatic classification is, therefore, a logical place to begin the environmental comparisons. Numerous authors have proposed climatic classifications based on a range of key climatic parameters (see Tuhkanen (1980) and Bluthgen and Weischet (1980) for literature reviews). The key parameters most used are temperature, precipitation and evaporation, with many classifications based on any one, or a combination, of these factors. These parameters also have been used as surrogate measures of other climatic elements, such as solar radiation, frost occurrence, wind and seasonality.

In addition to utilizing different parameters, climatic classifications also vary according to whether these parameters are defined by mean or extreme values, and whether these values are based on hourly, daily, monthly, or annual records. As the most commonly collected climatic data are of daily temperature and precipitation, those classifications based purely on such data are supported by the largest number of climatic stations, and the plotted distributions of their classified climatic environments are most precise. This does not imply, however, that classifications based on these factors best summarise world climatic environments. The spacing of meteorological stations effects all classifications, as the positioning of climatic boundaries

between recording points is only subjective interpolation. This becomes increasingly important in areas where climatic stations are widely spaced, and in mountainous areas where climate changes rapidly over short distances. For this reason, many climatic classifications do not include mountainous areas in their coverage. It is also of relevance, that the climate recorded at a weather station is not necessarily the climate experienced by nearby plants. The mico-climate inside a Stevenson screen may differ from that of neighbourhood vegetation.

Classifications also differ according to the number of categories of climatic type that they recognise.

In determining which climatic classifications to use, it was decided to sample from the range available. Preference was given to those classifications that have proved useful in understanding or predicting the successful establishment of introduced plants, usually for forestry or agricultural purposes. It was also essential that these classifications should be globally applicable, as introduced plants have originated from all over the world.

The range of classifications was sampled because of the probability that those based on similar parameters, with comparable climatic categories, would yield similar results. Tuhkanen (1980 p70), for example, found that isopleths of eight, largely temperature based indices, all matched the polar treeline as well as each other, while Kawamura (1971), found that the differing aridity/humidity indices of Lang, Angstrom, de Martonne and Kira showed similar patterns of distribution across Monsoon Asia. This is hardly surprising, given that the positioning of climatic boundaries often relies on widely spaced climatic stations, while boundary lines frequently represent only the mean position of many individual yearly or monthly positions, which may depart by hundreds of kilometres from the real mean (Russel 1924).

The classifications chosen are tabulated and characterised in Table 5.1. Overall, nine classifications by seven different authors were used. All the classifications employ some sort of temperature parameter, seven of them also include a precipitation parameter, while three employ some measure of evaporation; three also involve measures of radiation, while one

Table 5.1(a) CLIMATIC CLASSIFICATIONS USED IN THE ESTABLISHMENT OF A SPECIES CLIMATIC PROFILE

CLASSIFICATION	PARAMETERS	NUMBER OF CATEGORIES	LOGIC BEHIND CLASSIFICATION	ADVANTAGES OF CLASSIFICATION	DISADVANTAGES OF CLASSIFICATION	PREVIOUS USE OF CLASSIFICATION IN THE STUDY OF INTRODUCTIONS
Koppen's Revised version (Koppen + Geiger 1961)	1st order -mean temperature of warmest and coldest month -mean annual temperature - mean annual precipitation 2nd order -seasonal distribution of rainfall - degree of druness or cold	11- one of these a mountain climate	An emperical classification that juggles climatic data so that climate categories, best match vegetation distribution.	Widely used and applied	- Climatic zones don't actually correspond with vegetation boundaries (Shear 1966,Tuhkanen 1980, Ackermann 1941.) -Indicies somewhat arbitrary and unrelated (Carter 1966) -Based entirely on mean values.	Rodman (1986), used it to compare, a little inclusively, the native and some naturalised ranges of Cakile maritima and Cakile eduntula Koppen's climatic zones, such as his mediterranean and tropical zones, are often used when discussing the origins of introduced species (Mack 1986, Macdonald etal 1988,)
Walter's ecological or zonobiomes	Based on zones of atmospheric circulation, but determined from diagramatic representations of monthly temperature and precipitation values, and their seasonality.	10- one of these a mountain climate	To find climatic zones that correspond well to vegetation and soil bounderies	Diagramatic representation of climate, allows for a easy identification of homoclims.	-Divisions between zones arbitrary in nature and not clearly defined -Homoclim analysis relies on subjective assessment of diagrams	Roy et al (1989), used it to test whether or not invasive species of annual brome grasses, (Bromus spp.), originate from areas of similar climate to that of where they are invasive. They found in the negative, which challenges the homoclim approach.
Thornthwaite's (1948) Potential Evaportranspiration The amount of water that would be evaporated from an area if there were no shortage of water	computed from daily and monthly temperatures, with adjustments made for latitude (number of hours of sunlight)	6 subdivisions were used	net radiation is of primary importance to evaporation. As there is a fixed relationship between the net radiation used for heating, and that used for evaporation, temp. can serve as an index to potential evapor.	Based on 13,000 climatic stations. Widely applied	-Assumption that PE. can be gauged from temperature, does not hold very well in windy or tropical conditions (Kayane 1971, Box 1986) -Based on monthly averages. -Based on a formula originally constructed on the basis of largely American data	Peyton (1971) found it useful in selecting exotic species suitable for plantations in South Africa. Krebs (1976) found it a good indicator of plantation success and naturalised occurence of Pinus radiata in Chile. Chicoine et al(1985) found it of some use in predicting sites, in Montana U.S.A, vulnerable to the invasion of Spotted knapweed, Centaurea maculosa
Thornthwaite's (1948) Moisture Index revised by Thornthwaite and Mather (1955)	$MI = \frac{100(S-D)}{PE}$ S = Water Surplus (Precipitation(P) - PE) D = Water Deficit (PE - P)	5 major divisions	Available water is important to life, and can be calculated from water gained from precipitation with water lost through runoff and evaporation. Runoff occurs when a soil reaches field capacity	Based on a large number of climatic stations -relates potential water loss through evapotranspiration and runoff, with water gained in precipitation.	-No allowence for the effect of extreme events.	

Table 5.1(b) CLIMATIC CLASSIFICATIONS USED IN THE ESTABLISHMENT OF A SPECIES CLIMATIC PROFILE

CLASSIFICATION	PARAMETERS	NUMBER OF CATEGORIES	LOGIC BEHIND CLASSIFICATION	ADVANTAGES OF CLASSIFICATION	DISADVANTAGES OF CLASSIFICATION	PREVIOUS USE OF CLASSIFICATION IN THE STUDY OF INTRODUCTIONS
Budyko's Radiation Balance	Solar radiation estimated by summing the number of days that have daily mean temperatures above 10°C. Budyko, 1959, found a linear relationship between this temperature sum, and the radiation recieved at Soviet actinometric stations	maps 14 categories	Solar radiation is the primary climate forming factor, so this is the parameter on which to base a classification	- Use of temperature sum may be particularly appropriate to plant distributions as temperatures above 10°C, may correspond with net growth in plants.	-Only based on 1300 land stations, most without long term records. -Correlation between temp sum and radiation balance, only tested on Russian data -No coldness sum i.e., certain plants may not survive more than a certain degree of cold	The concept of a temperature sum above 10°C is widely applied in the planning of Soviet agriculture, and has been of some use in deciding which grape varieties are best suited to climatic conditions in Australia, and California (Macintyre pers. comm.)
Budyko's Index of dryness	Radiation balance is divided by the latent heat required to evaporate all the precipitation that falls during the year.	maps 6 categories	Similar to Thornthwaite's moisture index, in that it unites components of the heat and water balances	-Adds to the temperature sum classification, by incorporating a precipitation index.	- Based on few climatic stations. - As above	
Troll + Paffen Seasonal climates	-latitudinally differing length of solar radiation. -yearly fluctuations of temperature -seasonal distribution of rainfall	5 major divisions 31 subdivisions	It is the rhythm or seasonality of climate that is important to life	-Identifies fluctuating climatic zones from constant zones		
Ivanov's Zones of continentality	Combines annual amplitude of air temperature, with daily amplitude of air temperature, and a measure of humidty. The sum of these three components is then devided by a latitude dependent factor	10 divisions	Continental climates are drier, and have greater flucuations in temperature, than oceanic climates	-reflects importance of temperature near the poles, and precipitation near the equator - indentifies fluctuating from constant climatic zones	-Based on few stations -Allowance for latitude presumably made because the tilt of the globe, makes polar temp. more variable than tropical temp. irrespective of continental/maritime position. Thus areas differing in latitude but of the same C/M zone will have different climates	
Nix's globe - bioclim	18 equally weighted parameters are computed in a non-hierachial classification to yield 142 classes. Each class has a measured degree of similarity with the others. Parameters include mean annual temperature and precipitation, highest and lowest monthly mean values of these variables, and values based on three monthly (quater) periods.		Computers allow the use of a large number of parameters, that create a climatic envelope. Annual parameters indicate, total energy + water inputs ; the monthly parameters indicate extremes and annual renge : Quarterly data shows seasonality	-differences between climatic classes are quantifiable -Based on a large number of parameters, including extreme and average events.	-Based on 4,000 unevenly distributed climatic stations, South America has particually few data points. -Climates may best be described not through equally weighting parameters, but by giving particular key parameters greater emphasis	Nix and Wapshere (1986), found bioclimatic matching to be important to the successful establishment of introduced birds, and invertebrates, used in biological control. The classification has also proved successful at predicting natural or introduced distributions of eucalypts and acacias (Booth 1986, Booth et al 1988, 1989), grasshoppers (Kehlmann Pers. Comm.), Elapid snakes (Nix 1986), Nothofagus cunninghamii (Busby 1986), and thepathogen Phytopthora cinnamoni (Podger et al 1990)

classification is based on zones of atmospheric circulation. For three of the classifications extreme climatic values and seasonality are important, while the remaining six rely mainly on mean values. The number of parameters used ranges from one to eighteen, while the number of climatic categories recognised ranges from 5 to 142. Most of the classifications have major and minor categories. Normally, only major classifications were used, because there had to be sufficient intrusive and unintrusive plants occurring naturally under each category of a climatic classification to highlight significant relationships. Major categories are also those most frequently mapped.

5.2 Soil Classifications

Unlike climate, few global soil classifications exist. Most emphasis has been put into independent national systems, which have been developed to suit particular needs (Clayden 1982 p58). Recognizing the need for an integrated knowledge of world soils, FAO/UNESCO, in association with the International Society of Soil Science, produced a world soil map, 1:5,000,000, in which twenty-six major soil units were employed. When possible the distribution of these units was based on *"factual information derived from actual surveys"* (Anon, 1974 p3). In poorly sampled areas, such as North Africa, Central America and India, the kinds of soils present were largely interpreted from data on landforms, geology, vegetation and climate.

The forerunner of the FAO/UNESCO map was The United States Comprehensive System of Soil Classification (Buol et al. 1980). Although not as accurately mapped as the later classification, this system also was used in this study to compare source and sink soil environments, as it has fewer (12) major soil types.

5.3 Vegetation Classifications

Vegetation classifications, like those of soils, are also in need of integration. Unfortunately a FAO/UNESCO (1973) proposed classification has not been applied globally. There are numerous global vegetation classifications, however, based on floristic, physiognomic, structural or environmental features, or combinations thereof. The classifications that provide the best worldwide comparisons are those based on physiognomy and vegetation structure (Anon 1973 p114, Werger and Sprangers 1982). The classification of

Schmithusen (1976), which is based on thirty major vegetation types, was adopted for the comparison of source and sink vegetation. It is noted for its "clarity and information content" (Mueller-Dombois et al. 1974 p419).

The older classification of Schimper and Faber (1935), with fifteen mapped units, was also used. This classification has been influential (De Iauvenfels 1975), but like climatic classifications by Walter (1985) and Koppen (1961), it is derived from a combination of vegetation and climatic features.

5.4 The Environmental Envelope

Of the nine climate, two soil, and two vegetation classifications used, only that of Nix provides a measure of the similarity or difference between the environmental units used in a classification. The quantitative data deriving from Nix's classification are thus treated separately from the qualitative presence/ absence data of the other classifications. The environmental units used in these remaining classifications are shown in table 5.2, and include fifty-eight climatic units, forty-two vegetation units and thirty-seven soil units. As would be expected there is much duplication between classifications.

To determine whether or not the natural distributions of intrusive species are dependent on the distribution of any one, or a number, of these environmental units, 2x2 present/absent contingency tables were constructed. The subprogram **CROSSTABS**, available in the SPSS computer package, was used for this purpose. The chi-squared statistic was used to test for dependence, while the contingency coefficient assessed the strength of the relationship. Consideration was given only to the commonly planted species of each city.

The results are shown in table 5.3. Although there are several highly ($p<0.001$) significant relationships their strength is poor. The strongest dependency recorded occurs between species intrusive in the Adelaide area and an origin from places with Koppen's Cs(Mediterranean) Climate. Examination of the 2x2 table for this relationship shows that, of Adelaide's 114 intrusive species, thirty-one (27%) do not naturally occur under a Cs climate, while of the 189 species that do occur, 106 (56%) are non-intrusive. Thus none of the environmental units, on their own, allow any firm predictions of the potential intrusiveness of a plant introduced from one

Table 5.2: CLIMATIC, VEGETATION, AND SOIL UNITS USED IN ESTABLISHING ENVIRONMENTAL ENVELOPES OF SPECIES DISTRIBUTIONS

CLIMATIC UNITS

THORNTHWAITE'S POTENTIAL EVAPOTRANSPIRATION

1). PE < 42
2). 42 < PE < 57
3). 57 < PE < 85
4). 85 < PE < 114
5). 114 < PE < 142
6). 142 < PE

THORNTHWAITE'S MOISTURE INDEX

7). PERHUMID
8) HUMID
9). SUB-HUMID
10). SEMIARID
11). ARID

BUDYKO'S RADIATIVE INDEX OF DRYNESS

12). < 1/3 HUMID
13). 1/3 - 2/3
14). 2/3 - 1
15) 1 - 2
16). 2 - 3
17). > 3 DRY

BUDYKO'S RADIATION BALANCE

18). < 20 Kcal $cm^{-2}yr$
19) 20 - 30 kcal $cm^{-2}yr$
20) 30 - 40 kcal $cm^{-2}yr$
21) 40 - 50 kcal $cm^{-2}yr$
22) 50 - 60 kcal $cm^{-2}yr$
23) 60 - 70 kcal $cm^{-2}yr$
24) 70 - 80 kcal $cm^{-2}yr$
25) > 80 kcal $cm^{-2}yr$

TROLL + PAFFEN : SEASONAL CLIMATES OF THE EARTH

26). POLAR AND SUBPOLAR ZONES
27). COLD TEMPERATE BOREAL ZONE
28) COOLTEMPERATE ZONES
29). WARM TEMPERATE SUBTROPICAL
30). TROPICAL ZONE

IVANOV'S ZONES OF CONTINENTALITY

31) 1 + 2 MOST OCEANITIC
32) 3
33) 4
34) 5
35) 6
36) 7
38) 8
39) 9
40) 10 MOST CONTINENTAL

KOPPEN'S CLASSIFICATION

41) Af -Tropical wet (Rainforest)
42) Aw -Tropical wet and dry
43) Bs -Steppe or semi-arid
44) Bw -Desert or arid
45) Cf -Humid temperate
46) Cs -Mediterranean
47) Cw -Warm with dry summer
48) Df -Cold with moist winter
49) Dw -Cold with dry winter
50) E -Polar climate

WALTER'S ZONOBIOMES

51) I EQUATORIAL
52) II TROPICAL
53) III SUBTROPICAL-ARID
54) IV WINTER RAIN
55) V WARM-TEMPERATE
56) VI TYPICAL TEMPERATE
57) VII ARID TEMPERATE
58) VIII COLD TEMPERATE

VEGETATION UNITS

SCHIMPER + FABER'S CLASSIFICATION

59) TROPICAL RAINFOREST
60) SUBTROPICAL RAINFOREST
61) MONSOON FOREST
62) TEMPERATE RAINFOREST
63) DECIDUOUS FORESTS
64) CONIFER FORESTS
65) SCLEROPHYLL WOODS
66) SAVANNA
67) THORN FOREST + SCRUB
68) SAVANNA
69) STEPPE
70) HEATHS
71) DRY DESERTS
72) ABOVE TREE LINE
73) COLD DESERTS

SCHMITHUISEN'S CLASSIFICATION

74) TROPICAL RAINFOREST
75) TROPICAL MOUNTAIN RAINFOREST
76) TROPICAL SEMI-EVERGREEN RAINFOREST AND MONSOON FOREST
77) TEMPERATE RAINFOREST
78) MOUNTAIN PINEFOREST
79) EVERGREEN BOREAL PINEFOREST
80) LAUREL FOREST + SUB-TROPICAL RAINFOREST
81) SCLEROPHYLL VEGETATION

Table 5.2; CONTINUED

SCHMITHUISEN'S CLASSIFICATION

82) DRY CONIFER FOREST + XEROMORPHIC SHRUBS
83) THORNTREES + SUCCULENTS
84) TROPICAL DRY FOREST + CAMPOS CERRADOS
85) DECIDUOUS FOREST
86) DECIDUOUS FOREST + PINEFOREST
87) STEPPE
88) DECIDUOUS PINEFOREST
89) THORN + SUCCULENT SCRUB
90) WET SAVANNA
91) DRY SAVANNA
92) THORN SAVANNA
93) BLACK-EARTH STEPPE
94) SUB-POLAR MEADOW + DECIDUOUS SHRUBS
95) DRY STEPPE + HARD CUSHION FORMATIONS
96) MOIST PUNA TUNDRA, ABOVE TREE -LINE VEGETATION, +
97) COLD DESERT
98) SEMI-DESERT
99) DESERT

SOIL UNITS

FAO/UNESCO CLASSIFICATION

100) FLUVISOLS
101) GLEYSOLS
102) REGOSOLS
103) LITHOSOLS
104) ARENOSOLS
105) RENDZINAS
106) RANKERS
107) ANDOSOLS
108) VERTISOLS
109) SOLONCHAKS
110) SOLONETZ
111) YERMOSOLS
112) XEROSOLS
113) KASTANOZEMS
114) CHERNOZEMS
115) PHAEOZEMS
116) GREYZEMS
117) CAMBISOLS
118) LUVISOLS
119) PODZOLUVISOLS
120) PODZOLS
121) PLANOSOLS
122) ACRISOLS
123) NITOSOLS
124) FERRALSOLS
125) HISTOSOLS

U.S. DEPT. OF AGRICULTURE CLASSIFICATION

126) ALFISOLS
127) ARIDISOLS
128) ENTISOLS
129) INCEPTISOLS
130) HISTOSOLS
131) MOLLISOLS
132) OXISOLS
133) SPODOSOLS
134) ULTISOLS
135) SOILS IN AREAS WITH MOUNTAINS
136) VERTISOLS

region into another. Taken together or in groups, however, the results obtained do highlight several key pointers to the likelihood of a species being intrusive.

5.5 Climatic Matching

The environmental units occurring both within city limits, and within 250km of each of the city areas studied, are indicated in table 5.3. These South-eastern Australian units are hereafter referred to as matched units. A 250km radius was used because both the fluctuating nature of environmental boundaries, and the gross generalisations inherent in their global mapping, mean that all environmental units contained within a city area will not be mapped. The full range of environmental conditions experienced is best gained from a regional perspective.

In table 5.4, the matched units have been grouped together, and tested for dependence with intrusiveness. The results indicate a dependence between matching climates and intrusiveness.

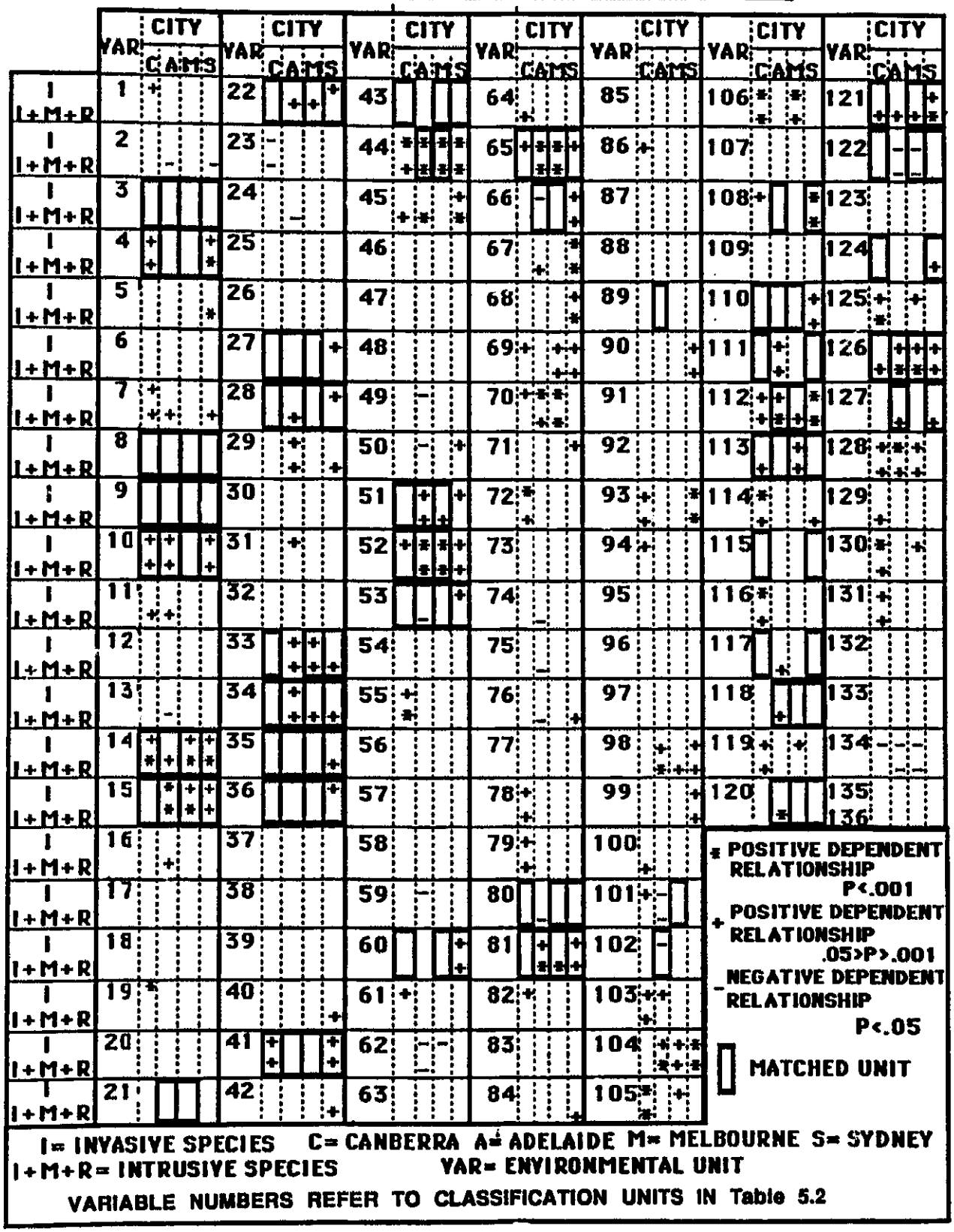
Table 5.4

Intrusiveness v's Environmental Matching

	Climatic Units		Vegetation Units		Soil Units	
	M	U	M	U	M	U
+ve association	33(19)	25(39)	7 (4)	29(32)	16(12)	30(34)
no association	42(55)	128(115)	10(13)	113(110)	21(24)	72(69)
-ve association	1(3)	7(5)	1(1)	6(6)	1(2)	6(5)
	df = 2		df = 2		df = 2	
	x^2 = 21.98		x^2 = 3.30		x^2 = 3.01	
	P < 0.001		N.S.		N.S.	

M = Matched unit U = Unmatched unit
(55) = Expected number

Table5.3; THE RELATIONSHIPS BETWEEN ENVIRONMENTAL UNITS AND INVASIVENESS AND INTRUSIVENESS



Vegetation and soil units associated with intrusiveness are independent of units that occur within South-eastern Australia. These vegetation and soil units, however, may be related to each other and to the intrusive-related climatic units.

In order to group together environmental units with chiefly the same species occurring across them (i.e, they occur in the same places), a hierarchical cluster analysis was performed, on the data for each city. Use was made of the CLUSTAN programme package. The group average linkage measure was chosen to fuse groups into a similarity hierarchy. This measure is the average of the similarity between groups, where all individuals of one cluster are paired and measured against all individuals in another. Group average linkage was used because it measures a group as a whole, and it is not overtly affected by intermediates (Wishart 1975 p33).

Two measures of similarity were used in the clustering of groups, these were the Jaccard and Phi coefficients. A simple matching, or Euclidean distance measure could not be used as there are several environmental units in which few species occur. If such units were compared they would demonstrate a large number of Absent/Absent matches, which would then dominate the analysis. As a consequence the groups obtained would reflect little more than the number of species occurring over each environmental unit (Williams 1971 p312). The Phi measure was more suitable because it measures the proportions of the different Present/Present, Absent/Present, Present/Absent, and Absent/Absent, possibilities. The Jaccard coefficient ignores Absent/Absent matches, but usually produces more reliable hierarchies than Phi (Wishart 1975 p120-121).

In the cluster analysis, environmental units containing less than 10% of the species were excluded. For each city the cluster analysis was employed to produce from five to ten clusters for each similarity measure. Dendrograms using the Phi measure, at the ten cluster level are shown in figures 5.1-5.4. The dendrograms obtained using the Jaccard coefficient tended to be dominated by one large cluster, while the arrangement of environmental units within clusters varied substantially from that of the Phi analysis. Both coefficients did, however, produce similar clusters of recognisable ecological affinity. About 100 environmental units were sorted for each city. Only

FIGURE 5.1; CLUSTERING OF ENVIRONMENTAL UNITS ACCORDING TO THE SPECIES, INTRODUCED TO ADELAIDE, THAT THEY HAVE IN COMMON

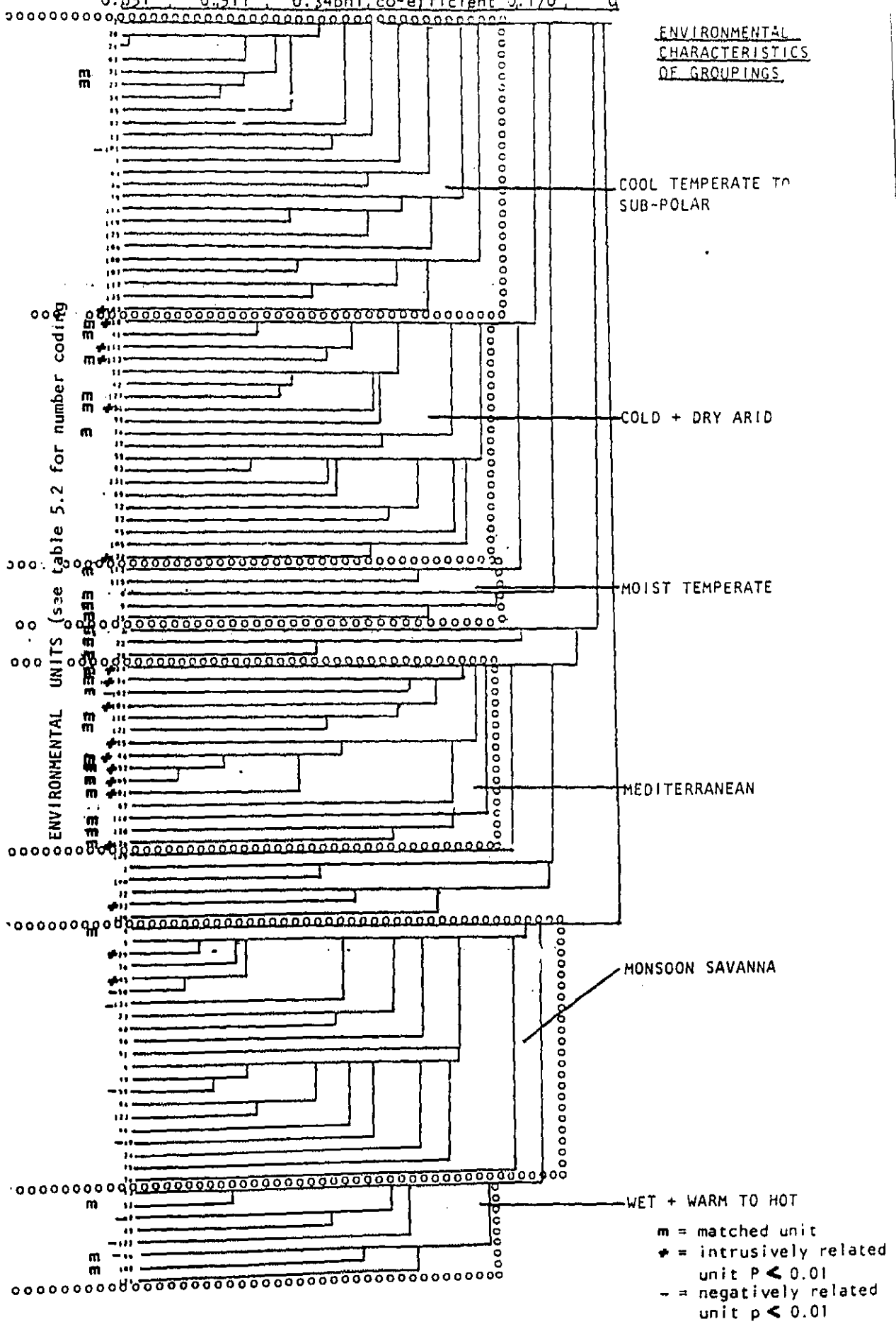


FIGURE 5.2: CLUSTERING OF ENVIRONMENTAL UNITS ACCORDING TO THE SPECIES, INTRODUCED TO CANBERRA, THAT THEY HAVE IN COMMON

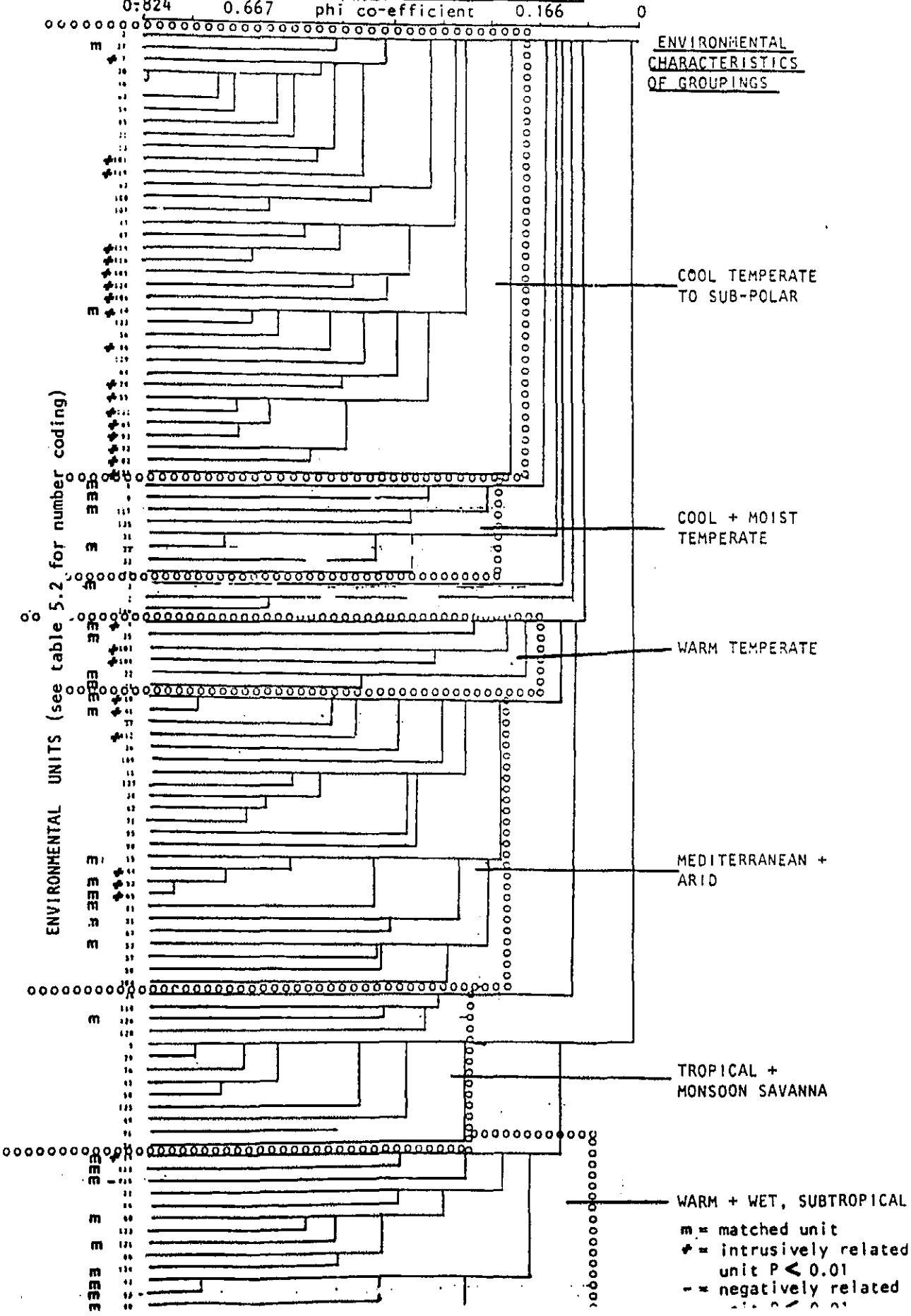


FIGURE 5.3: CLUSTERING OF ENVIRONMENTAL UNITS ACCORDING TO THE SPECIES, INTRODUCED TO MELBOURNE, THAT THEY HAVE IN COMMON

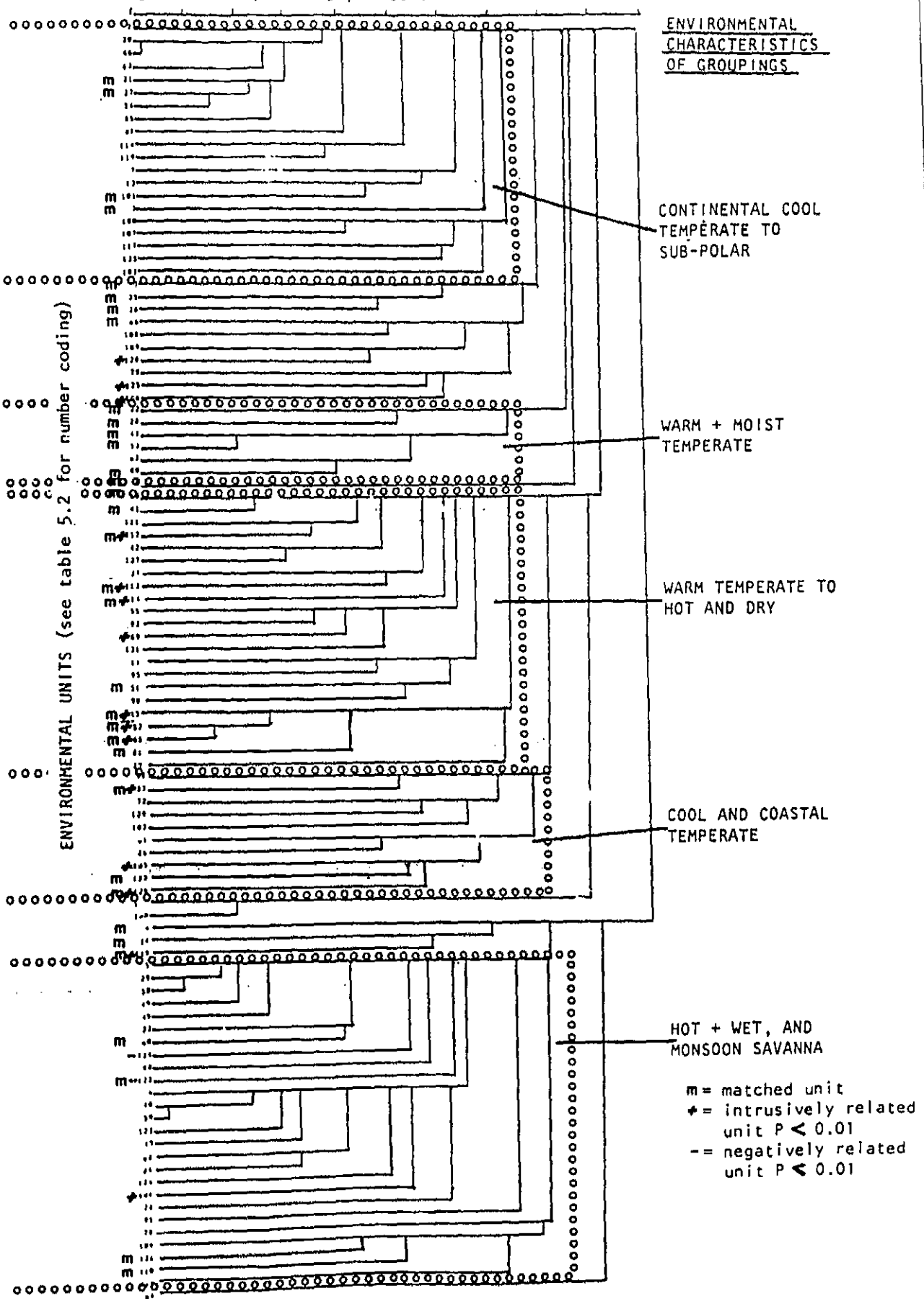
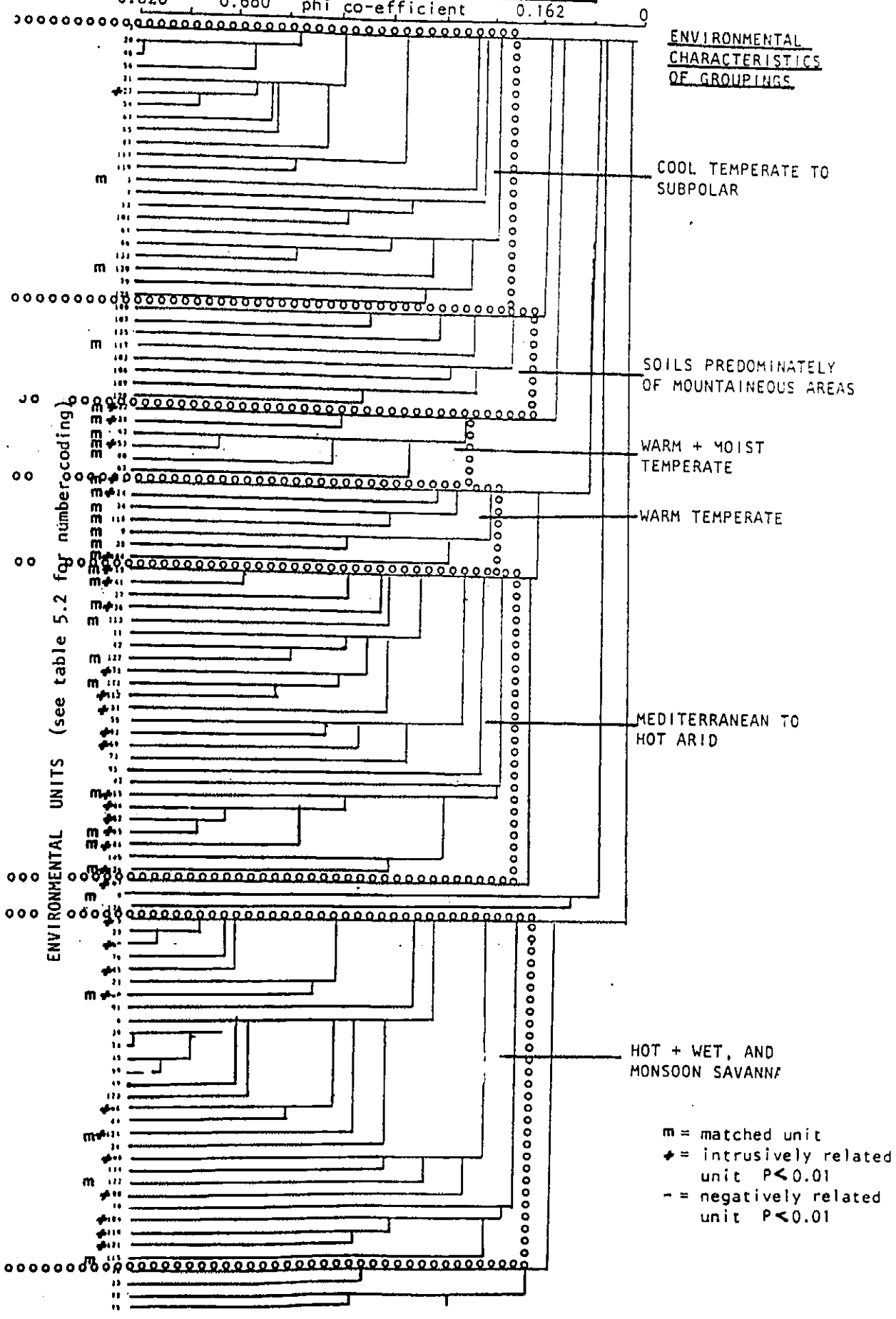


FIGURE 5.4: CLUSTERING OF ENVIRONMENTAL UNITS ACCORDING TO THE SPECIES, INTRODUCED TO SYDNEY, THAT THEY HAVE IN COMMON.



twelve units were not placed within equivalent clusters using the Jaccard or Phi coefficients.

For all cities, the clusters identified groupings of units indicative of cool temperate to sub-polar conditions, which are placed closest to various warm or moist temperate groupings. In turn they share some species with units characteristic of Mediterranean and arid areas. Species of tropical and monsoon areas form the most distinctive grouping. These groupings are the clusters of ecological affinity previously referred to.

Environmental units associated ($P<0.01$) with either intrusiveness or invasiveness are marked (+) in figures 5.1-5.4. These units tend to occur together. This indicates that the intrusively related soil and vegetation units share many of the same species as the intrusively related, and usually matched (m), climatic units. Further indication of the dependencies between the various environmental units is given in the statistical analysis and discussion of Chapter 8.3. Of the clusters with more than 25% of their members being matched units, 29% of these members are associated with intrusiveness, while only 12% are intrusive in clusters with less than 25% matching units.

The degree to which intrusive species originate from similar environments varies from city to city. Matching of environments is most critical in Adelaide, with intrusive species only being associated with units from Mediterranean and arid groupings. The situation in Melbourne is similar to that of Adelaide, except that intrusive species are also related to more temperate conditions. Probably this is indicative of Melbourne's milder climate.

The majority of intrusively related, but climatically unmatched units occur in two clusters, at opposite ranges of environmental conditions. Species that occur naturally in the Boreal cool to cold temperate zones are likely to be intrusive in the Canberra region, while species from the sub-tropics and monsoon savannah are likely to be intrusive in Sydney. As Canberra's climate is colder than the other cities, while that of Sydney is the most tropical, presumably unmatched species can invade bushland in these cities

because their respective environments do not exceed critical tolerance or requirement levels.

The conclusion, that intrusive and invasive plants are likely to come from areas of similar climate, is reinforced by the cluster analysis. Species that occur over warm or moist temperate, Mediterranean, arid or sub arid environments are likely to be intrusive in South-eastern Australia. Species from cold temperate or sub-polar conditions are unlikely to be intrusive in Adelaide, Melbourne, or Sydney, while species from sub-tropical forests and monsoon savannah, are least likely to be invasive in Canberra, Adelaide and Melbourne.

5.6 Intrusiveness and origin from an unmatched environment

If natural occurrence under a particular environment led to the selection of intrusive traits, then one would expect that species originating from such an environment would be intrusive throughout South-eastern Australia, irrespective of climatic differences. There are seventeen environmental units associated with intrusiveness in at least three of the four cities studied. Of these, sixteen are either matched environmental units, or belong to a clustering where more than a quarter of its members are matched units, i.e they contain many of the same species growing across them as do matched units.

The only environmental unit that is associated with intrusiveness, but is not associated with environmental matching, is the FAO/UNESCO chernozem soil class (Black earth). This is a soil rich in organic matter. Many of the sites of invasion studied in urban bushland have been greatly enriched in nutrients, through urban pollution and runoff. Possibly species originating from a chernozem soil type are well adapted to growth in such conditions. It is important to note, however, that chernozems are largely restricted to 40^{o} to 45^{o} North, and towards the middle of continents. Woody species that occur in these areas, are not restricted to them, but have large distributions. The importance of widespread distribution is discussed in 5.8. It also should be born in mind that the strength of association between intrusiveness and a chernozem soil type is weak.

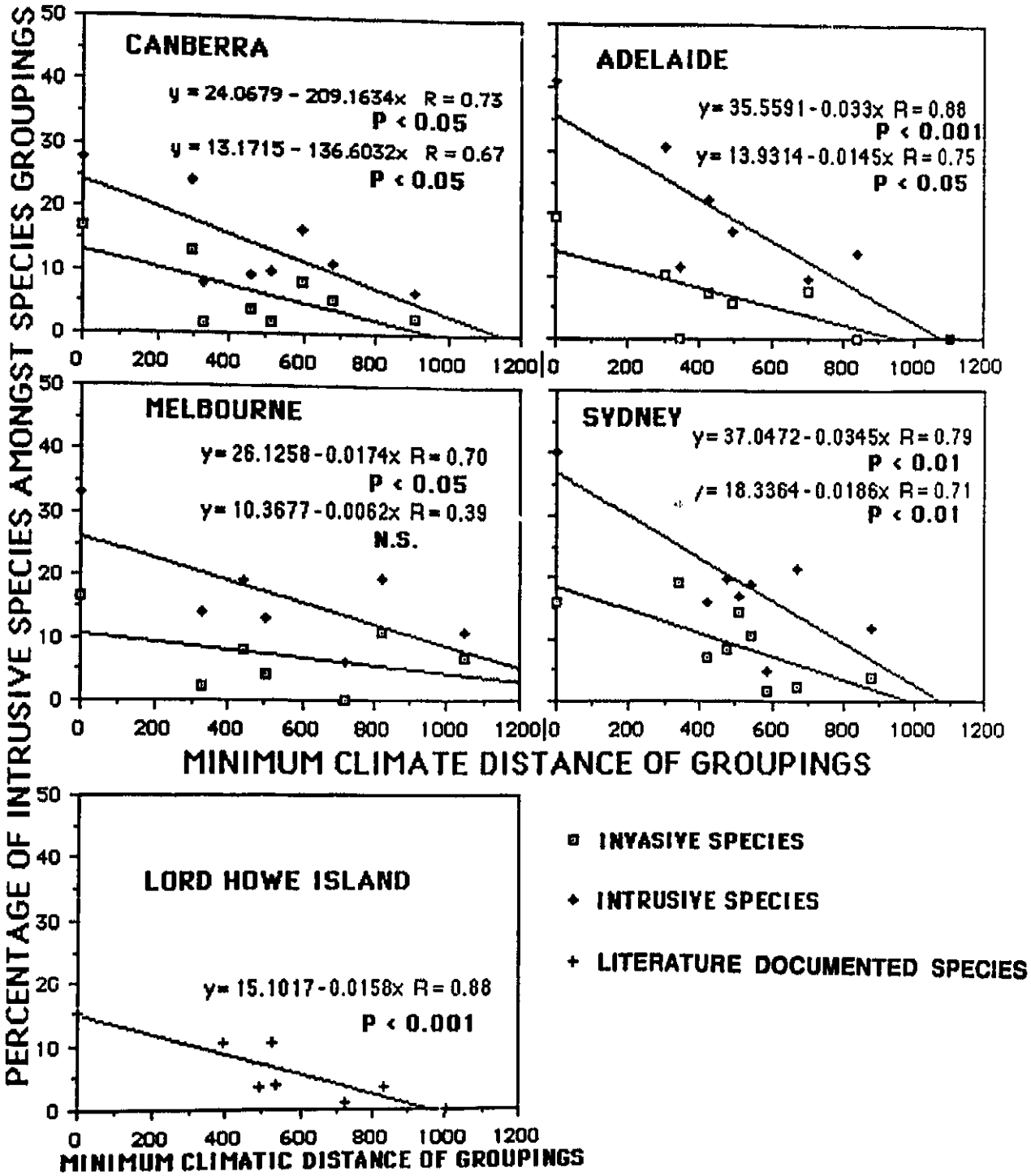
5.7 Globe-bioclim and intrusiveness

The finding that matching climate analysis is important to intrusiveness, may be tested further against the quantitative data of the Nix classification. In the Nix globe-bioclim classification, the climates experienced at 4,000 climatic stations are classified according to eighteen equally weighted parameters, into 142 climatic types. Each climatic type has a measured degree of similarity with all others. The natural distributions of the top 500 most/longest planted species in any city were again studied, and the different climatic types that occur over a species natural range recorded. As examples, *Acer japonicum* (Japanese maple) indigenously restricted to Japan, occurs over the climatic types 17, 60, and 37, while *Acer pseudoplatanus* (Sycamore), of European origin, occurs over the climatic types, 100, 96, 98, 95, 85, 19, 74, 21, 97, 71, 22, 16, 113, 93, 60, and 20. A species climatic profile was then compared against the profile of a particular city area. For example, the Canberra area experiences a climate of type 96, while Melbourne experiences a climate of types 99 and 100. Comparisons were made using the mean, minimum and maximum climatic distance between the climatic types of a species climatic profile and those of the city of introduction.

In figure 5.5, minimum climatic distances of the 500 species commonly introduced to each city have been placed into groups of about 50 species, according to their numerical value. The average climatic distances for these groups were then computed and plotted against the percentage of intrusive and invasive species occurring within the groups. Plots for Lord Howe island were also produced, using relevant Sydney data (see chapter 4.5 for discussion).

For Lord Howe and all four cities studied, there are significant correlations between minimum climatic distance and intrusiveness. The less the climatic distance between somewhere in the source area and area of introduction, the more likely it is that a species will be intrusive. The correlation between invasiveness and minimum climatic distance is not as strong, though there is a relationship. For all cities at least 16% of species in the closest matching grouping are invasive while the percentage of invasive species amongst those with greatest minimum climate distance ranges from 0% (Adelaide) to 10.6% (Melbourne). This result is consistent

Figure 5.5: MINIMUM BIOCLIMATIC DISTANCE V'S INTRUSIVENESS



with the earlier finding that intrusive species usually originate from areas of climatic similarity, and not from areas of dissimilarity.

No correlations between intrusiveness and mean climatic distance were obtained for Canberra, Sydney, or Lord Howe Island (see figure 5.6). In contrast, for Adelaide and particularly Melbourne, correlations stronger than those obtained using minimum climatic distance, were obtained. This suggests that for Adelaide and Melbourne intrusive species tend to have natural ranges largely occurring over areas of matched climate, while for Canberra and Sydney, intrusive species tend to match somewhere across a climatically widespread range. This agrees with the earlier finding that a larger than expected proportion of Canberra's intrusive species originate from non-matched cold-temperate areas, and that many of Sydney's intrusive species originate from a sub-tropical/Monsoon savanna environment.

World maps illustrating the minimum climatic distance from Adelaide, Canberra, Melbourne and Sydney are given in figures 5.8 -5.11.

Maximum climatic distance.

The plots of maximum climatic distance (Fig. 5.7) were the least significant of all. There is, however, a tendency for species that have a middle of the range maximum climatic distance to be more likely to be intrusive, than those of either a small or large maximum distance. Given previous results, one would expect that a species introduced to an area with a climate dissimilar to that of its region of origin (i.e, with a large maximum climatic distance), would be least likely to be invasive. Why then is the reverse not true? A plausible explanation is that species with only a small maximum distance tend not to occur over wide areas. As may be seen in figures 5.12 - 5.13, in all graphs except that of Lord Howe Island, there is a strong correlation between intrusiveness and the size of a species distribution.

Figure 5.6;
MEAN BIOCLIMATIC DISTANCE V'S INTRUSIVENESS

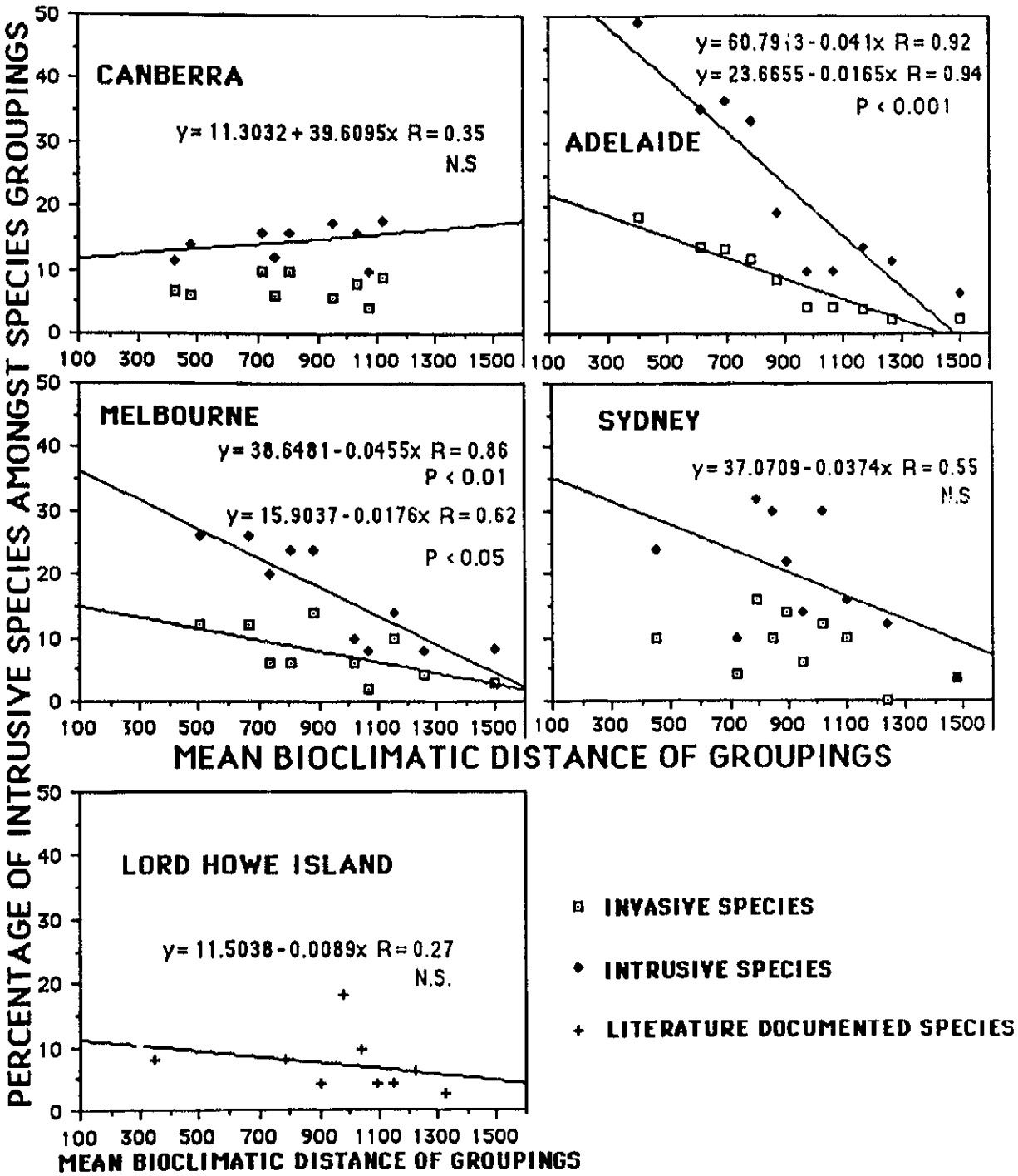


Figure 5.7

MAXIMUM CLIMATIC DISTANCE V'S INTRUSIVENESS

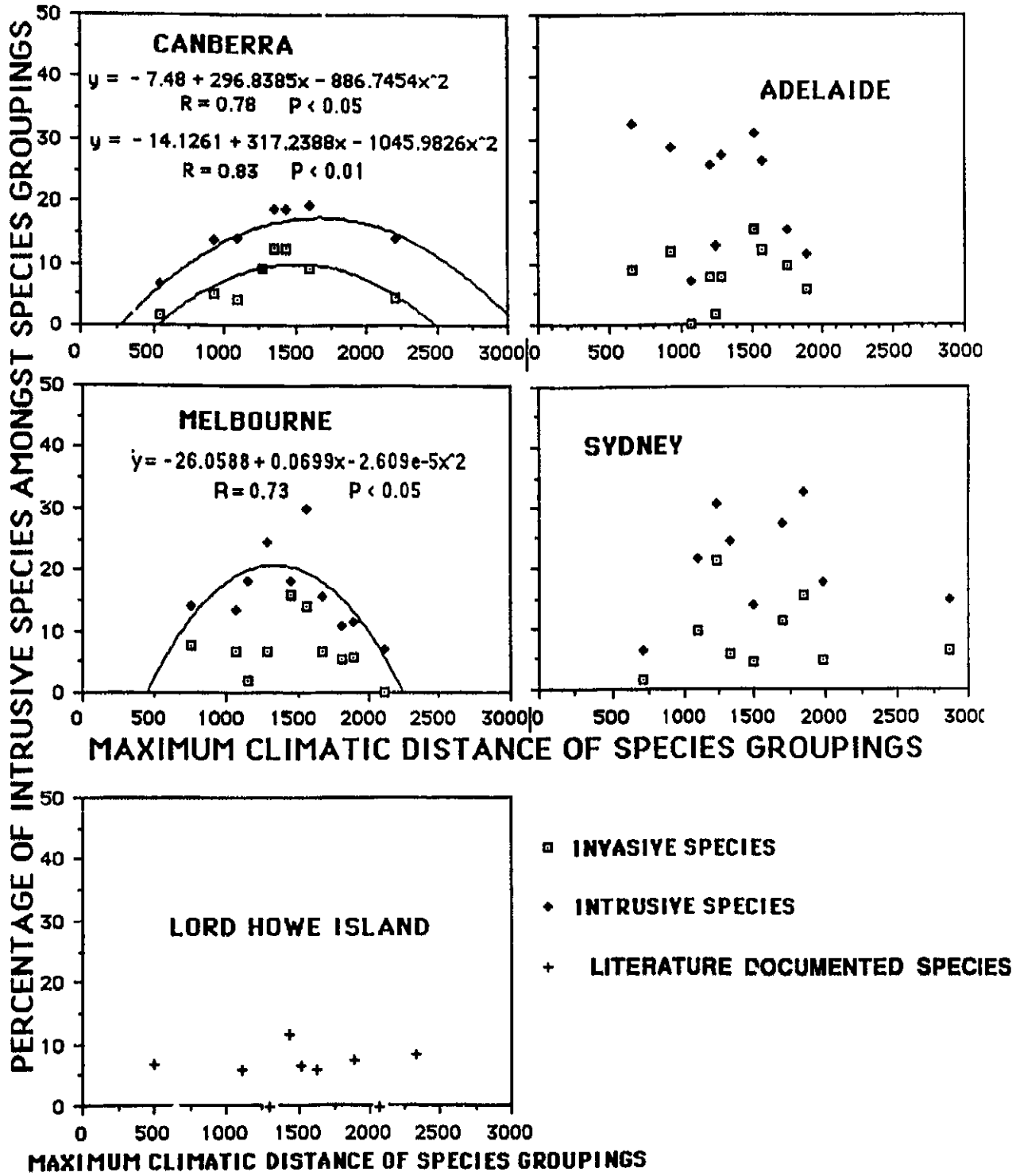


Figure 5.8. CLIMATIC DISTANCE FROM THE CLIMATE EXPERIENCED AT ADELAIDE, AS MEASURED BY NIX'S GLOBE-BIOCLIM CLASSIFICATION

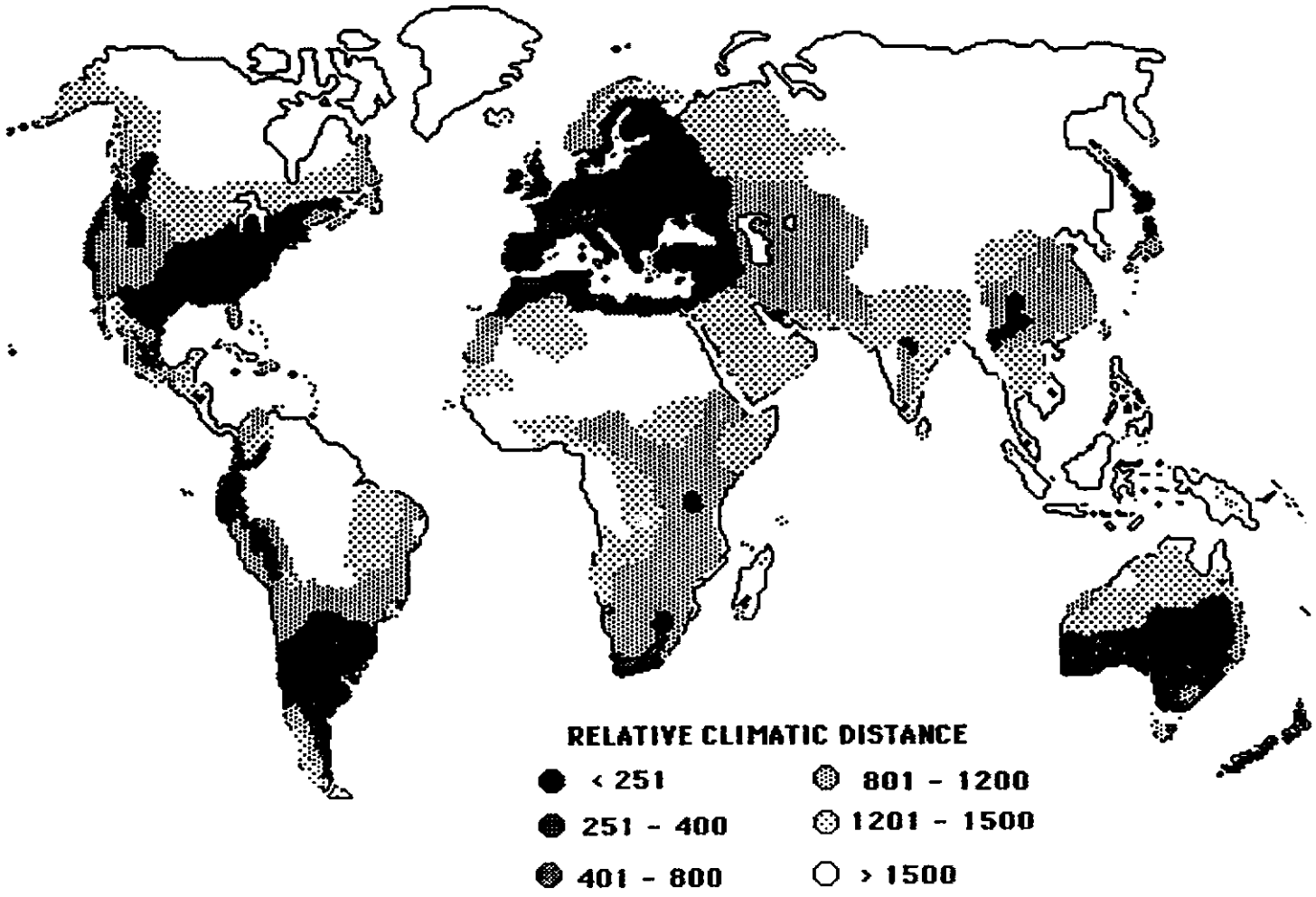


Figure 5.9. CLIMATIC DISTANCE FROM THE CLIMATE EXPERIENCED AT CANBERRA, AS MEASURED BY NIX'S GLOBE-BIOCLIM CLASSIFICATION

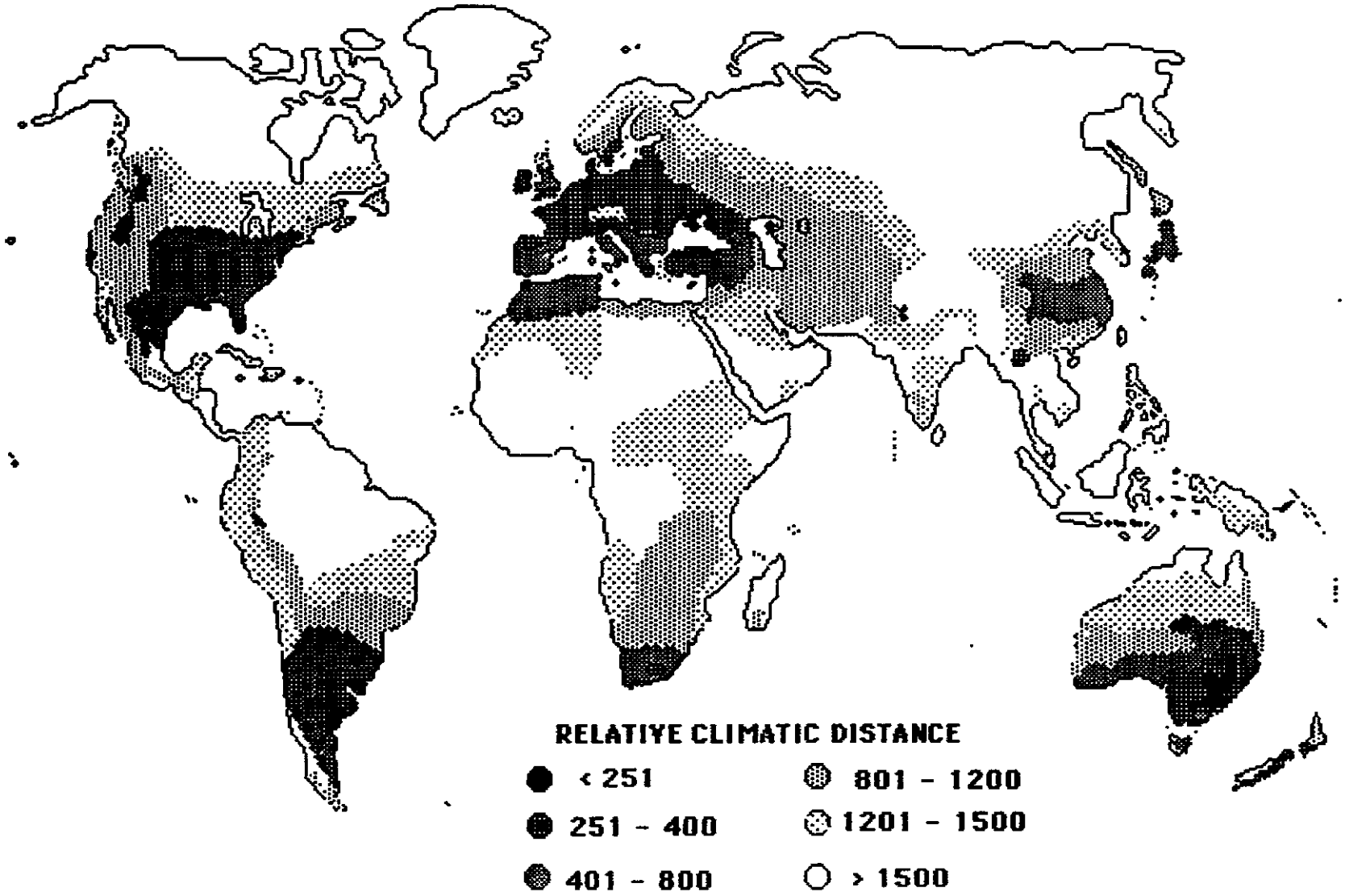


Figure 5.11 CLIMATIC DISTANCE FROM THE CLIMATE EXPERIENCED AT SYDNEY, AS MEASURED BY NIX'S GLOBE-BIOCLIM CLASSIFICATION

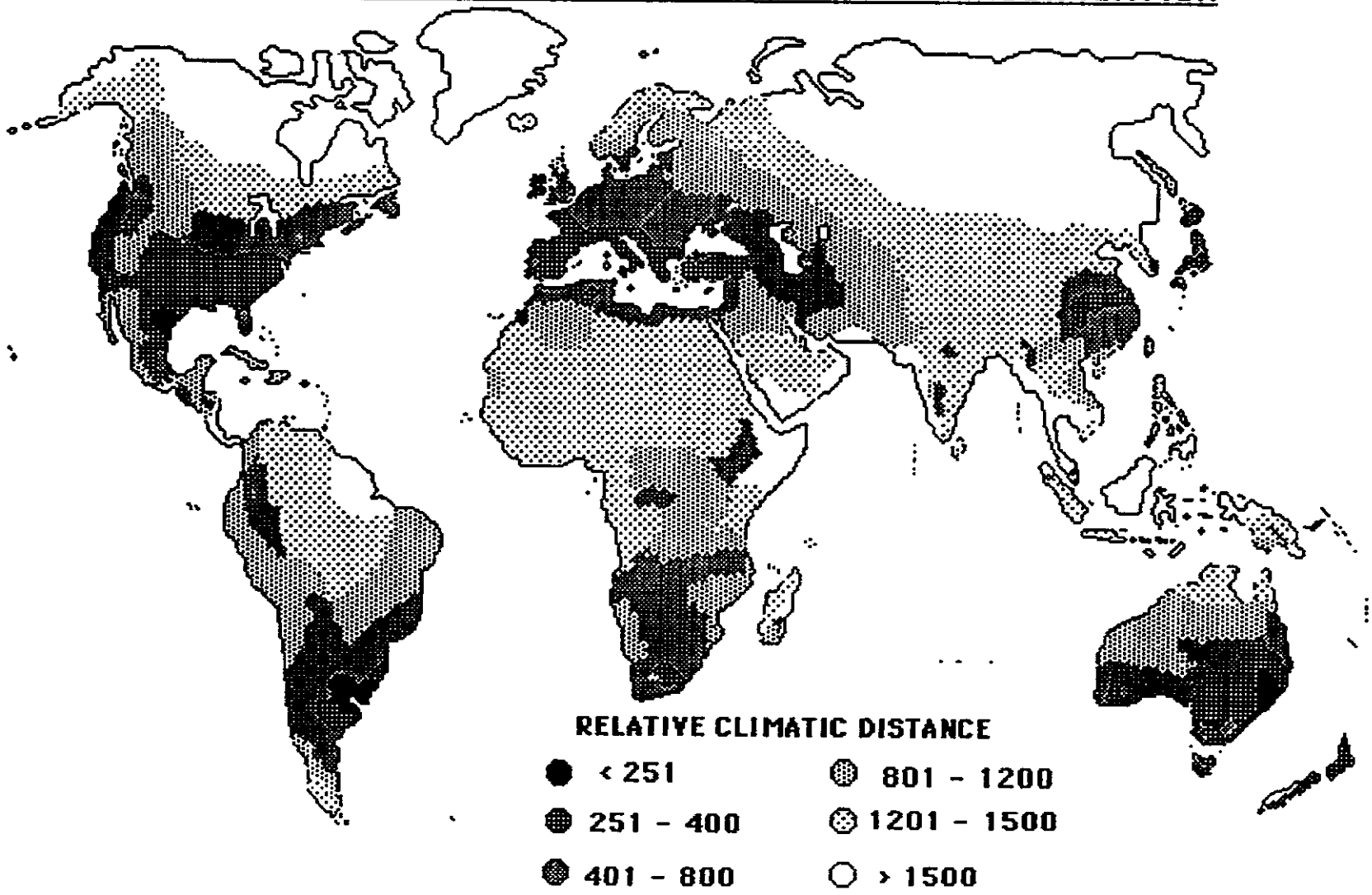
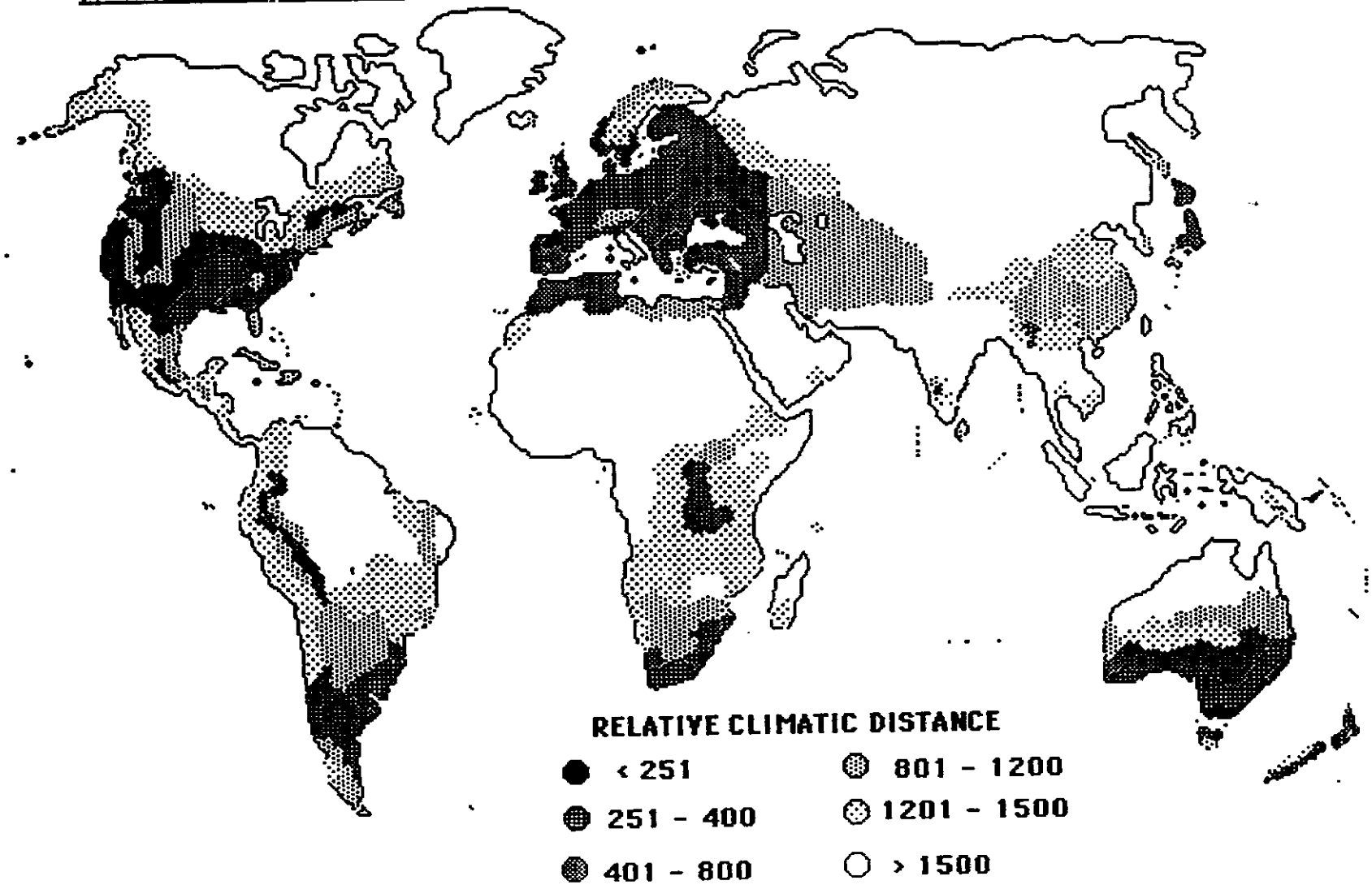


Figure 5.10 CLIMATIC DISTANCE FROM THE CLIMATE EXPERIENCED AT MELBOURNE, AS MEASURED BY NIX'S GLOBE-BIOCLIM CLASSIFICATION



5.8 Range Size Vs Intrusiveness

The size of a species range was not measured by geographic area, but by climatic and environmental width. This was measured by the number of environmental units (table 5.2) and Globe-bioclim types, that a species naturally occurs over. Roy et al. (1988), employed a similar technique when using the number of climatic zones of Walter et al. (1975) that a species occurs over as a measure of range size. This study found a positive correlation between invasion in any Mediterranean climate region, and native range size of the grass *Bromus*.

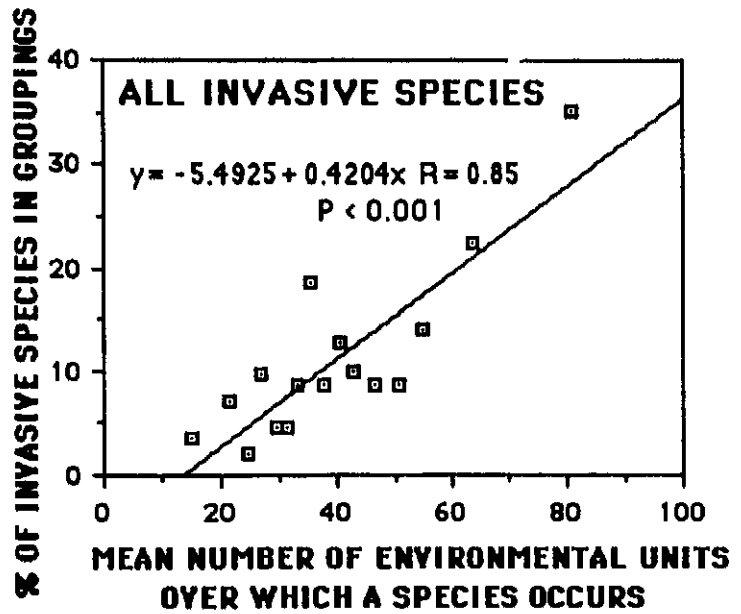
As outlined in chapter 4.2, several other authors have found that species with widespread ranges are more likely to be invasive than those with restricted ranges. (Moulton and Pimm 1986(a), Forcella and Wood 1984, and Ehrlich 1988). As discussed previously (chapter 4.2) two explanations have been put forward:

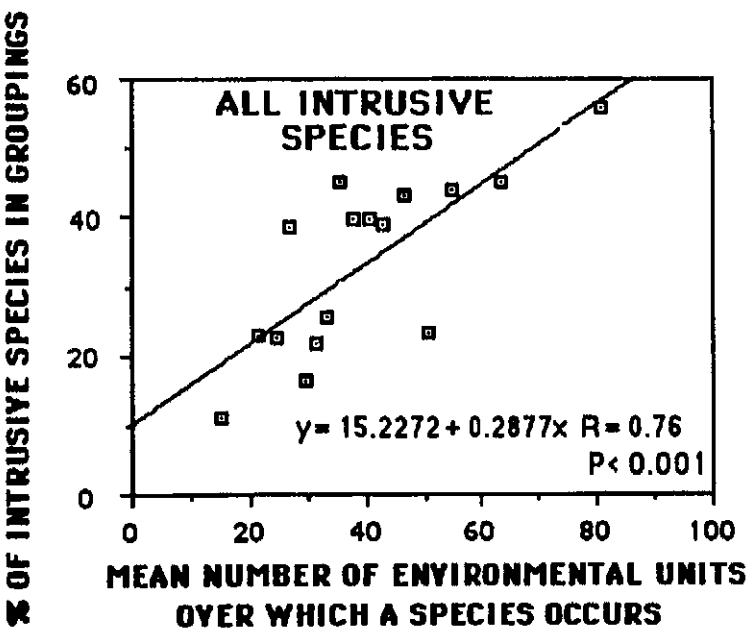
1. Widespread species are more likely to be transported; and

2. Widespread species are ecological generalists, with much genetic diversity, which makes them adaptable in different situations. (The same properties that allow *"some species to spread within their native continents also allow...them to invade other continents."* Roy et al. 1988).

Roy et al. (1988), although not totally rejecting the first hypothesis, dismisses it on the basis that increases in intercontinental exchanges since 1900 have meant that there is a high probability that all species will be transported. This is a dubious assumption, given that it is relevant not only whether a species has been transported or not, but also when and in what numbers it was transported. Nevertheless, as the data presented here were only gained from the top 20-25% of the most/longest planted woody species in South-eastern Australia, the results support the second explanation. That is, broad ecological amplitude, as measured by distribution, is a key factor leading to intrusiveness. The correlation is particularly strong for invasive species (figure 5.12).

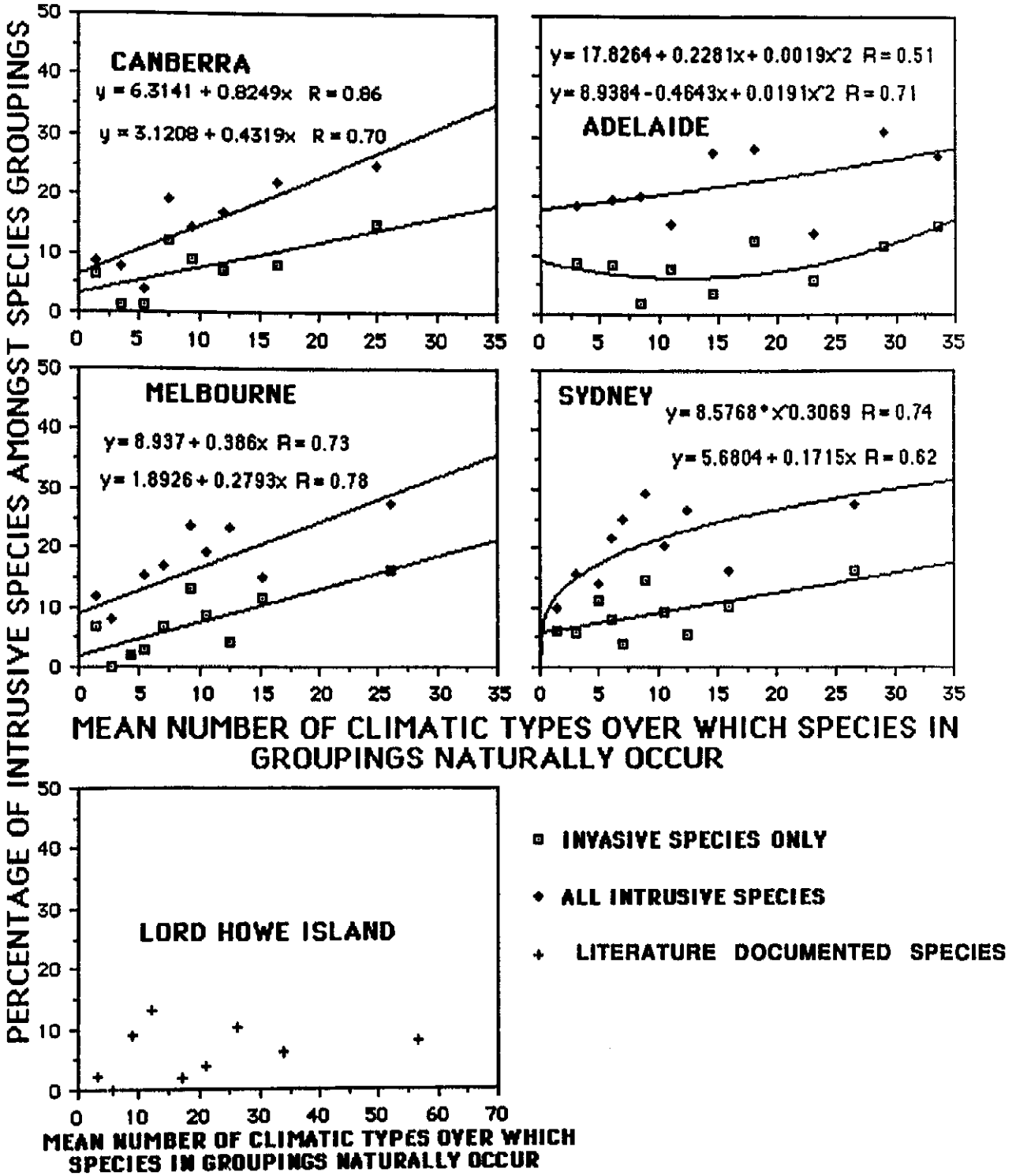
Figure 5.12: NUMBER OF ENVIRONMENTAL UNITS THAT A SPECIES NATURALLY OCCURS OVER V'S INTRUSIVENESS





(number of species = 874, aprox 50 per point)

Figure 5.13: NUMBER OF NIX'S CLIMATIC TYPES THAT A SPECIES OCCURS OVER V'S INTRUSIVENESS



Lord Howe Island is an interesting exception to the rule that species with broad ecological amplitude are more likely to be invaders (Figure 5.13). In comparison to the mainland sites, Lord Howe has a benign oceanic climate, with little seasonal or daily variation. Hence ecological adaptability may not be as important a factor there, as in more extreme environments. In contradiction to this hypothesis, however, is the strength of correlation between intrusiveness and climatic matching, which was fairly constant throughout all of the cities and island studied. It is relevant that as the majority of plants introduced to Sydney, and thereby to Lord Howe, originated in temperate areas (figs. 2.1-2.12), they may find Lord Howe's equable, but sub-tropical, climate more extreme than the fluctuating, more temperate climates of the mainland.

5.9 Summary of information derived from environmental classifications

None of the classifications used was adequate for the precise isolation of intrusive from non-intrusive species, although some were more successful than others. The climatic classifications possessing least predictive value were Budyko's Radiation Balance, and the seasonal evaluation by Troll and Paffen. The climatic classifications that best identified intrusive species were those of Koppen, Walter, Nix, and Budyko's radiative index of dryness. Nix's classification has the advantage of allowing a quantitative handling of the data, and the combining of different categories of climate type.

The success of a particular climatic classification varied from city to city. As examples, Thornthewaite's Potential Evapotranspiration was adequate for identifying Sydney's intrusive species, but not very applicable anywhere else, while Budyko's index of dryness worked best in Adelaide. Thus reliance on one classification (Roy et al. 1988, Rodman 1986, Nix and Wasphere 1986), may not prove the best way to conduct homoclim analysis. However, it should be noted that only the presence/ absence data of Koppen's Mediterranean climate and Nix's measure of minimum climatic distance are required to provide maximum precision in distinguishing invasive from non-invasive species amongst South-eastern Australia's woody plantings. (This is discussed in greater detail in Chapter 8.3.)

Most classifications indicated that intrusive species are likely to originate from, or have a natural range across, climates similar to that of where they were introduced. Environmental conditions associated with intrusiveness, and identified through vegetation and soil classifications, tended to occur in the same global locations, as matched climatic units. Thus, although intrusive species are likely to originate from areas of heath or sclerophyllous vegetation, and from Arensols, Xerosols, and Alfisols, these also were the same species that originate from areas of similar climate.

Ehrlich (1989), notes that many temperate or arid zone vertebrate species have successfully invaded benign, moist, tropical habitats. He proposes that being native to a stressful environment may be a characteristic of a good invader. For the woody plants, introduced into temperate South-eastern Australia, there are no consistent or strong correlations, however, between invasiveness and origin from a particular environment, other than the generalisation that an area of successful invasion climatically resembles the area of origin. Of the classifications employed, Ivanov's continentality index best identifies extreme from benign climates. Invasive species were not associated with any of the stressful continental climates.

In terms of prediction, most classifications identified a group of about 10-20% of all species that naturally occurred in an area of climatic similarity. Of this group some 35-50% of the species are intrusive. In the groups of greatest climatic dissimilarity, accounting for 5-20% of all species, only about 5-10% of the species are intrusive. Clearly climatic matching is an important factor, but not the sole one, leading to intrusive success.

One of the major reasons why climate matching lacks success in predicting woody weeds in South-eastern Australia, is that information on the climatic origin of plants is very generalised. Nix and Wasphere (1986 and Pers. Comm.) and Booth et al. (1989 and 1990) had much higher rates of successful prediction in their homoclim analysis of bird, invertebrate and tree introductions. The data they used included exact source locations or precise distribution information gained from herbaria records. Instead of considering the entire range of a species, which in itself is a generalisation, they were able to compare the place of introduction with known site(s) of origin. Undoubtedly, information of this kind would have enhanced the predictions of this thesis.

An approach that is worth considering in climatic matching, is to concentrate on matching the climate at the centre of a plant's range rather than including the environments at the extremities. Hengeveld (1987) notes that it is at the centre of a plant's range where it is usually most abundant and stable. The central environment seems more favourable to a species existence, and occurrence of this environment elsewhere may determine intrusive ability.

Another problem inherent in homoclim analysis is that neither the world's climate, nor plant distributions are static. Continental drift has led to long term climatic change (Kemp 1981), while the most recent period of geological history, the Quaternary, has been characterised by dramatic climatic fluctuations (Singh 1982). As a consequence of changing climates plants have continuously adapted to new conditions. Some species, such as *Gingko biloba*, have a more restricted range today than formerly (White 1986 p200), while other species, such as North American chestnuts, *Castanea spp.*, have expanded their range, with the changing conditions (Davis 1976). The relationship between climate and distribution is a dynamic state of flux, and undoubtedly many species are out of equilibrium (Hengeveld 1987). Consequently, because a plant grows under a certain climatic condition is no proof that it is most suited to that environment. Conversely because a plant does not grow under a certain climate, is no proof that it is climate that makes it an unsuitable habitat. Kruger et al. 1989, cite the example of *Pinus halepensis* whose natural distribution is limited through competition from native grasses. There would appear to be merit in including all a species known naturalised occurrences in any homoclim analysis.

The speed of climatic change predicted as part of the greenhouse effect also will complicate homoclim analysis. It is likely that if an area's climate changes significantly, then there will be a corresponding change in the invasive flora of that area. Rapid climatic change also raises the question of whether homoclim analysis should employ the mean of a long time- series of climatic measurements or only those of recent decades, which may be widely fluctuating?

Another problem of the approach taken in this thesis, is that many of the intrusive species collected in bushland areas, may have only become

recently established. This seems particularly likely given that many of the specimens collected were the first herbarium records of these species being intrusive. Recently established species are less likely to have experienced the climatic range of an area, and their survival may owe more to a run of a few favourable years, than pre-adaption to the overall climate of the area. Castri (1988) notes that most succulents and some southern hemisphere trees were so severely effected (eliminated in some regions of the Mediterranean), by the frosts of the winter of 1984-1985, that he wonders to what extent they are really naturalised in the Mediterranean environment.

Despite the problems inherent in the data, it is still robust enough to highlight a significant relationship between intrusiveness and climatic matching. Plants with widespread ranges were also clearly found to be more intrusive than those of restricted ranges.

5.10 Floral Kingdom and Intrusiveness

The earliest observations of a source environment, which apparently produced a disproportionate number of invasive species, was that of the northern hemisphere over the southern hemisphere (Darwin 1859 p379 and Hooker 1860 pc.v.)(see Shaughnessy for a review of this literature.) Darwin (1859 p201) proposed that "*natural selection tends only to make each organic being as perfect as, or slightly more perfect than, the other inhabitants of the same country with which it has to struggle for existence.*" As the northern hemisphere has the biggest land area, and presumably more plants, species from there " *have advanced through natural selection and competition to a higher stage of perfection or dominating power, than the southern forms*" (Darwin 1859 p339).

Since Darwin's time, numerous observations have been recorded of one-way invasions of northern hemisphere species into southern places. These include New Zealand(Allan 1936), South Australia, (Kloot 1987) and Chile (Fox 1987), and they tend to support his theory. However, these observations can be explained by human factors, such as unidirectional transportation of propagules, or creation or disturbance of habitats favourable to the northern species (Fox 1987, Kloot 1987, and Simberloff 1989).

Table 5.5 , shows the number of invasive, intrusive, and non-intrusive plants introduced to South-eastern Australia from each floristic kingdom (Good 1964 p30-32). Only those species occurring in the top 500 of most/longest catalogue listed species, for the cities studied, were considered. If a species belongs to two or more kingdoms, it was recorded as belonging to the kingdom over which the majority of its range occurred. The results indicate that intrusiveness is independent of floristic origin, and further suggest that northern species are not superior competitors to those of southern origin. The results obtained are similar to that of Moulton and Pimm 1986(a), who in an examination of successful and failed introductions of passerine birds to Hawaii, found no relationship between success rate and region of zoogeographical origin.

It is of interest that Australian species, introduced beyond their natural ranges, have not been significantly more or less intrusive than plants from any other floristic kingdom in the world (table 5.5).

5.11 Island versus Continental Environments

Darwin 1859 (p618) and Joenje (1987) point out that the logical extension of the theory that large land masses produce the most invasive species, is that continental species will be more invasive than those from islands. As a consequence islands also will offer less resistance to invasion. This notion is often expressed (Greathead 1971 p96, Carlquist 1965, and Brown 1989), and derives from the observation that islands support greater percentages of invasive species than continents. This seemingly lop-sided invasion may be due, as with the North/South observations, to other causes, including climatic (Williamson 1981 p30), human (Loope and Mueller-Dombois 1989, Simberloff 1989), or numerical (Simberloff 1986) factors.

Simberloff (1986) explains that in order to test whether continental species are competitively superior to island species, one would need information on success and failure rates of species introductions, from and into both island and continental sites. Simberloff collected such information from the 281 global biological control introductions of one beetle and five wasp genera. He found that success or failure of introductions did not depend on whether these insects originated from or were introduced to, island or continental sites.

Table 5.5 INTRUSIVENESS V'S FLORISTIC ORIGIN

KINGDOM

	Boreal	Palaeo-Tropical	Neotropical	Cape	Australian	New Zealand	TOTALS
INTRUSIVE	100 (104)	34 (29)	20 (21)	3 (4)	58 (53)	2 (5)	217
NON-INTRUSIVE	385 (381)	99 (78)	79 (78)	16 (15)	189 (194)	20 (17)	788
TOTALS	485	133	99	19	247	22	1005

$X^2 = 4.6$ D.F. = 5 P = N.S.

The only other tests of island versus continental competitiveness have also compared insect biological control introductions: [Greathead 1971 (introductions to Africa and its offshore islands); Hall and Ehler 1979 (all biological control efforts of insects and arachnids); and Julien et al. 1984 (all biological control efforts of weeds)]. Unfortunately, little information on the source of introductions was analysed or presented in any of these studies. In contrast to Simberloff, Greathead and Julien et al., did find that control programmes on islands were significantly more successful than on continents. Success of a control programme does not equate with success of introduction however, with Julien et al. finding that establishment of organisms used in the biological control of weeds was greatest on continents. Hall and Ehler found that the opposite was true for those organisms introduced to control insects and arachnids.

A problem of all studies, as noted by Simberloff (1986), is that *"Most of the biological control efforts....on mainland or island are in agricultural communities, and these may be more similar to one another than pristine communities."* Another relevant factor, which may affect interpretation of the data, is that no distinctions have been made between continental and oceanic islands. Oceanic islands are those that have been separated always, or for millions of years, from continents (Wallace 1892 p242). Continental islands have been connected to a mainland several times, over long periods, and in recent geological history, as sea levels fall and rise. Assuming that terrestrial connection facilitates plant migration, continental islands would have been subjected to the supposedly superior competitive power of continental species to a greater extent than oceanic islands. Continental islands therefore fall into an intermediary position between continents and oceanic islands.

The plant introduction data presented in this thesis, together with Long's (1981) documentation of global bird introductions, allow further testing of the theory that continental plants have competitive superiority over island plants. In this test an oceanic island is classed as an island surrounded by at least 100m depth of water (MacArthur 1972 p108). Species have been grouped together because of the low number of island species introduced to continents, and because, in terms of prediction the key question is whether or not island species are likely to be invasive. The frequently relic genera of

islands may be fundamentally different to genera on continents, but this difference may be indicative of a less competitive environment.

In assessing Long's data, a bird species with a natural distribution across both an island(s) and continent(s), was recorded as of a continental origin, even in the few cases where the source of such a bird was an island. Only those cases that were known definitely to succeed, or probably failed, were considered. Cases where it was uncertain whether a bird was local were also excluded. This left a record of 899 introductions, which were classified according to source and target areas of introduction (see table 5.6).

A contingency test of this data yielded: $X^2 = 19.84$, df = 8, $0.025 > Pr < 0.01$. Therefore the hypothesis that success or failure of bird introductions is dependent on whether source and target areas are continents, continental islands, or oceanic islands is accepted.

It is significant that birds from a continental source were as likely to establish themselves irrespective of target area, while those from an oceanic island source have been successful only when released on another oceanic island. If biotic resistance was of major importance, then it would be expected that continental species would do best on islands, and worst on other continents. Since this was not the case, the results suggest that island birds are poorer invaders, rather than that islands are particularly suitable to invasion by birds. The number of species originating from both types of islands is small however, which leaves a question-mark over the reliability of the findings.

An unquestionable conclusion, however, is that many more bird species are recorded as being introduced to islands than to continents, despite the fact that continents occupy a much larger area. Thus islands have been susceptible to bird invasion, simply because more species of birds have been introduced to them. This has often been overlooked in discussion on the vulnerability of islands to invasion (Loope and Mueller Dombois 1989), and questions the importance of disharmony or low species number as explanations of island susceptibility.

Table 5.6: GLOBAL BIRD INTRODUCTIONS

Route of introduction

Route of introd.	Cont. to Cont	Cont. to C. Is.	Cont. to O. Is.	C. Is to Cont.	C. Is. to C. Is.	C. Is. to O. Is	O. Is to Cont	O. Is. to C. Is	O. Is. to O is	TOTALS
Success	**143** (147)	**43** (40)	**259** (263)	**8** (6)	**6** (4)	**9** (9)	**0** (2)	**0** (2)	**30** (24)	498
Failure	**123** (119)	**30** (33)	**217** (212)	**2** (4)	**2** (4)	**7** (7)	**3** (1)	**3** (1)	**14** (20)	401
TOTALS	266	73	476	10	8	16	3	3	44	899

$X^2 = 19.84$

$df = 8$

$0.025 > P < 0.01$

Cont = Continent
C. is = Continental Island
O. is. = Oceanic Island
217 = actual number
(212) = expected number

Plant Data

The focus of this thesis is on invasions in urban bushland of mainland South-eastern Australia, which is therefore the only target area from which data has been collected. As explained in chapter 4.2, however, the planting record of Sydney somewhat tenuously mirrors that of Lord Howe island, an oceanic island target. The number of species introduced from and into source and target areas is given in tables 5.7-5.8, along with the number of intrusive or non-intrusive species. Intrusiveness, i.e the ability of a plant to spread from plantings into native vegetation, is an analog of the term successful introduction, used by Simberloff and Long. Only commonly planted species were tabulated.

The analysis of the plant introduction tables indicates that continental species are significantly ($P < 0.001$) more likely to be intrusive in South-eastern Australia than species of island origin. There is no significant dependence between intrusiveness and area of origin, for species introduced to Lord Howe Island.

The results are consistent with those derived from Long's bird introduction data. The lowland areas of New Zealand's North Island and the north of the South Island provided nearly half of the oceanic island plants introduced into Australia. As the climate of these areas is very similar to that experienced in South-eastern Australia, it is unlikely that the results are a consequence of a bias in climatic matching favouring continental species.

Thus it appears, at least for birds and woody plants, whose introduction or spread has been into areas other than crops, that island species are less likely to be intrusive than those of a mainland origin. Since islands have small areas this conclusion is in agreement with, and perhaps related to, the finding that intrusive species have widespread rather than restricted ranges.

Of the hypotheses tested in this chapter, intrusive species were associated with an origin from climates that closely match that into which they were introduced. Other than this, no particular abiotic environment was found to be a significant source of intrusive species. However, intrusive species tend to occur over many different abiotic environments. In the following chapter hypotheses concerning the biotic environment are examined.

Table 5.7: WOODY PLANT INTRODUCTIONS INTO SOUTH-EASTERN AUSTRALIA

Source area of introduction

	continent	continental island	oceanic island	totals
success	179 (163)	1 (11)	6 (11)	186
fail	464 (480)	44 (34)	38 (33)	546
totals	643	45	44	732

$X^2 = 17.16$ df = 2 $P < 0.001$

Table 5.8: WOODY PLANT INTRODUCTIONS INTO LORD HOWE ISLAND

Source area of introduction

	continent	continental island	oceanic island	totals
success	38 (35)	0 (2)	1 (2)	39
fail	356 (359)	26 (24)	24 (23)	406
totals	394	26	25	445

$X^2 = 2.99$ df = 2 N.S.

356 = recorded number
(359) = expected number

CHAPTER 6: ENVIRONMENTAL DETERMINANTS - BIOTIC

6.1 Freedom from biological load

One of the major reasons why some species are invasive when introduced to new environments, is considered to be because they have escaped the natural constraints of predators, parasites and pathogens, in their native lands (Huffaker 1964, Debach 1974, Stirton 1978). This explanation is supported by numerous examples of successful control of invasive species once they are reunited with native biological enemies (Wilson 1960, Julien 1982). Studies have also documented that a species in its native environment suffers far greater predation than it does when introduced to a new foreign environment (Noble 1989, Lonsdale and Segura 1987).

Given that plant species suffer different levels of biological attack (Southwood 1961, Connor et al. 1980), it seems probable that some species will prosper more from the release of their biological burdens than others. It also is likely that introduced plant species will not be attacked equally by the insects and microbes, native to the areas into which they are introduced. If freedom from biological load is a reason for invasive success, then one would expect that differences in phytophagous attack between native or introduced environments would be reflected by differences in invasive occurrence.

Logic suggests that the species to gain most from the release of their biological burdens, would be those most heavily attacked. These over burdened species are likely to produce large numbers of flowers (Noble 1989), roots, or shoots, in order to compensate the heavy losses to biological organisms. Recurrent flowering and rapid growth and leaf turnover, also may be properties of heavily attacked species. Such properties may aid invasion, and an examination of most of these properties is attempted in chapter 7. Unfortunately comparable information on fecundity and growth features of ornamental species is limited, which restricts the analysis. However, as detailed in chapters 7 and 8 the information gleaned on fecundity and growth rate does not add to the precision in identifying invasive from non-invasive woody species in South-eastern Australia.

Directly relevant in determining the influence of the native biotic environment of a species on it's invasive potential, are several studies that have counted the number of insects and fungi attacking woody plants. The common conclusion of these studies is that the wider the natural distribution of a plant, the greater the number of insect and fungi species associated with it (Southwood 1960, 1961, Lawton and Schroder 1977, Strong 1979, Connor et al. 1980, McCoy and Rey 1983, Kennedy and Southwood 1984, Leather 1985). Several authors (Southwood 1960, 1961, McCoy and Rey 1983, Futuyma and Gould 1979) also found that locally abundant species supported the greatest number of phytophagous species. However, Hanski (1982) concluded that widespread species usually are the most locally abundant. Although widespread species do support the most herbivorous species, per se, there is no evidence that this equates with more enemies or damage per individual plant, than plants of species with restricted ranges.

Despite the lack of knowledge on the consequences of widespread plant species supporting a relatively large number of phytophagous species, such species have been shown to be significantly intrusive (see figures 5.12 - 5.13). If it is assumed that the number of herbivorous species, carried by a plant species, equates with the amount of predation suffered, then freedom from an especially severe phytophagous attack may be a further explanation for this result. Previously this relationship has been explained only in terms of unequal transportation of the more common plants, or their greater ecological adaptability.

If freedom from a severe biological burden is important to the success of widespread species, then one would expect widespread species to be the best targets for biological control. In table 6.1, all control attempts on woody weeds, (as listed by Julien 1982), have been categorised according to whether the target plant is a widespread or restricted species, and whether or not control was successful. A widespread plant is here defined as one that occurs over at least half a continent.

Table 6.1: SIZE OF A PLANT'S NATURAL RANGE AND SUCCESS OF BIOLOGICAL CONTROL OF WOODY WEEDS

DISTRIBUTION	SUCCESSFUL CONTROL	UNSUCCESSFUL CONTROL
restricted	**36** (29)	**15** (22)
widespread	**26** (33)	**31** (24)

$\chi^2 = 7.44$
$P < 0.01$

The results in table 6.1 conflict with expectation. Plants with restricted distribution have been more readily controlled than those with widespread distribution. The results are biased, however, by the fact that the large majority of biological control attempts on woody weeds have been on *Lantana camara* (a widespread species) or *Opuntia* species (which all have restricted distributions). Thus the results are more a comparison between control success on *Lantana* and *Opuntia*, than between widespread and restricted species. In table 6.2 these two genera have been excluded.

Table 6.2: SIZE OF A PLANT'S NATURAL RANGE AND SUCCESS OF BIOLOGICAL CONTROL OF WOODY WEEDS MINUS ATTEMPTS ON *Lantana* AND *Opuntia*

DISTRIBUTION	SUCCESSFUL CONTROL	UNSUCCESSFUL CONTROL
restricted	5	6
widespread	3	12

Table 6.2 suggests that, even when the two major genera are excluded, restricted species appear to have been more readily controlled by biological agents. The number of control attempts on other woody weeds has been too small for this trend to be statistically significant, but the results obtained do suggest that widespread plants owe their success as invaders to factors beyond freedom from a particularly severe phytophagous attack.

Taxonomic isolation

Taxonomic isolation is another factor that has been found to identify woody plant species that support large numbers of herbivore species. Species that are the sole, or nearly the sole, members of genera or families support fewer herbivores than those with many con-generic or con-familial relatives (Connor et al. 1980, McCoy and Rey 1985, Leather 1985). Whether taxonomic isolation is related to intrusive and invasive occurrence was tested for the plant families from which the common woody introductions into South-eastern Australia belong. Families were rated according to the number of world-wide species they contain (Willis 1931). No significant correlations were found (Figure 6.1). A highly significant relationship exists, however, with significantly fewer than expected intrusive and invasive species in families containing less than 100 species (Table 6.3). These families include Araucariaceae, Buxaceae, Juglandaceae and Magnoliaceae.

Tropical origin

Wellman (1968) and Barrett (1982) claim that because the Tropics are the areas of greatest phytophagous diversity, tropical plant species suffer the greatest phytophagous attack. The data presented in chapter five suggests, however, that being introduced into a suitable tropical/ semi-tropical environment is of far greater importance to the invasive ability of tropical plants, than escape from an excessive biological burden.

Studies on the comparative degree of biotic predation on woody plants introduced into South-eastern Australia are virtually nonexistent. Thus, the analysis of the effects of freedom from biological load has relied on indirect measures. Two of these measures, the size of natural distribution and taxonomic isolation, are associated with both invasive and intrusive occurrence in South-eastern Australia. While there is no evidence linking this association to causation, it is possible that inequality of biological load could prove a determining factor in a plant's invasive potential.

6.2 Attack by native herbivores

A common principle of plant/herbivore theory is that most insects and microbes feed on a few closely related species (Hering 1951 p152, Southwood 1960, Gibbs 1986). Thus the " *susceptibility of introduced plants to colonization by* (native) *herbivores should be a function of the presence of*

Figure 6.1 TAXONOMIC ISOLATION V'S INTRUSIVENESS

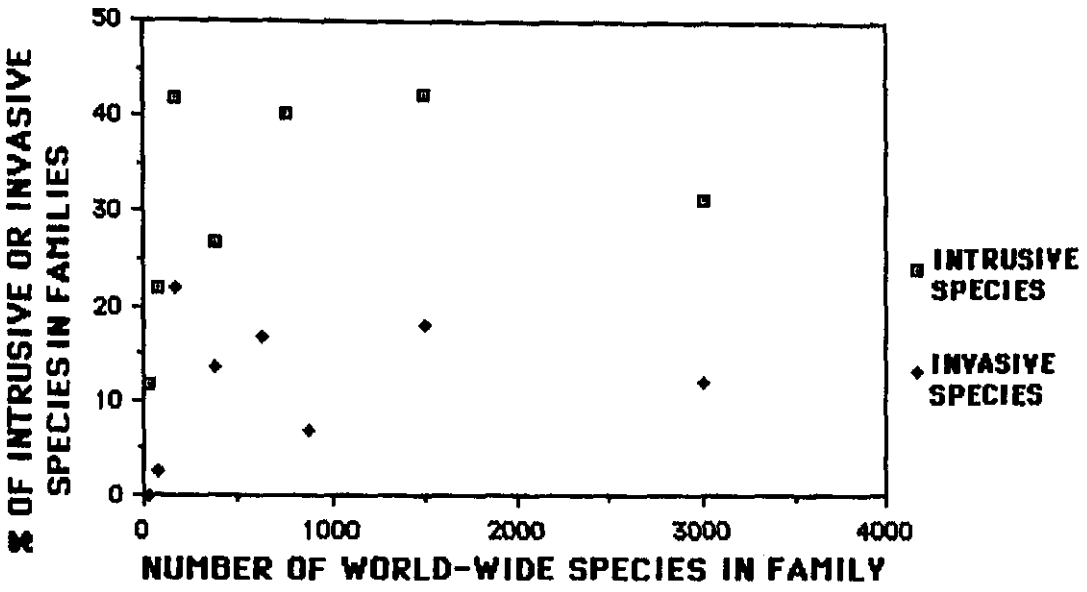


Table 6.3 TAXONOMIC ISOLATION V'S INTRUSIVENESS

NUMBER OF WORLD-WIDE SPECIES IN FAMILY	Number of invasive species	Number of non-invasive species	Number of intrusive species	Number of non-intrusive species
<100	1	95	15	77
>100	107	622	262	471
CHI-SQUARED (1 D.f.)	13.298		14.020	
SIGNIFICANCE	P<0.001		P<0.001	

related plants native in the locality of introduction - both degree of relatedness and species richness of related plants should be important." (Connor et al. 1980).

Conner et al. (1980), supported the above statement with a comparison of introduced and native members of the Fagaceae. In areas with few local members of this family, such as Australia and New Zealand, the number of native predator species attacking introduced Fagaceous species was low. For Europe and America, however, with many members of the family, the number of native species attacking introduced Fagaceae was high.

If the number of species feeding on a plant equates with the amount of damage suffered, then introduced species with many close relatives in the local flora should have their invasive ability constrained by biological predation. Figures 6.2 and 6.3 present evidence from South-eastern Australia. Families to which introduced woody species belong were rated according to the number of local species contained in each particular family, such that:

$$\text{LOCAL FAMILY ABUNDANCE} \equiv \frac{\text{No. of local species of a family}}{\text{total number of local species}}$$

It is evident that there is no correlation between Local Family Abundance and invasiveness or intrusiveness. However, in Adelaide, Melbourne and Sydney it was found that introduced species with many local relatives are significantly more intrusive (tables 6.4 and 6.5). This is the opposite finding to the expected result.

When all introduced species are compared against those introductions of species with co-genera in the local flora (tables 6.6 and 6.7), there is no relationship between generic relatedness and invasive occurrence. However, genra already present in the local flora such as *Acacia, Pittosporum* and *Coprosma,* when introduced into Melbourne and Adelaide, have proven more intrusive than non-related genera. In Canberra the reverse is true. Canberra's result is influenced by the large number and variety of eucalypts planted there. For all cities studied *Eucalyptus* is a particularly uninvasive genus. This is a little surprising,

Figure 6.2 INVASIVENESS V'S LOCAL FAMILY ABUNDANCE

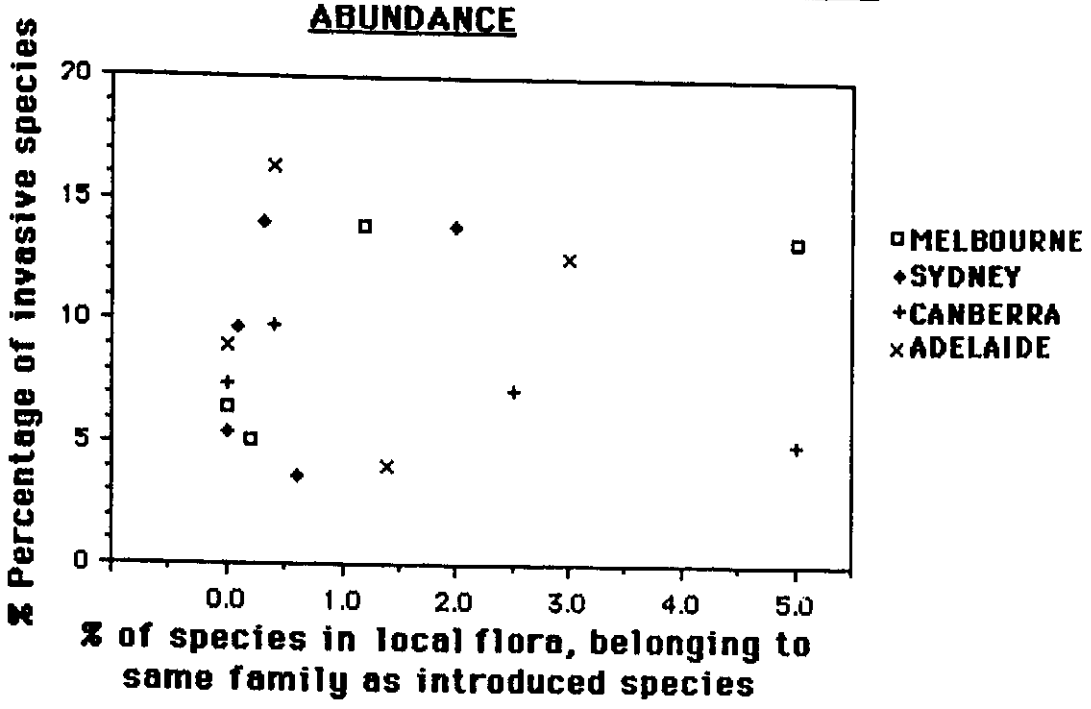


Figure 6.3 INTRUSIVENESS V'S LOCAL FAMILY ABUNDANCE

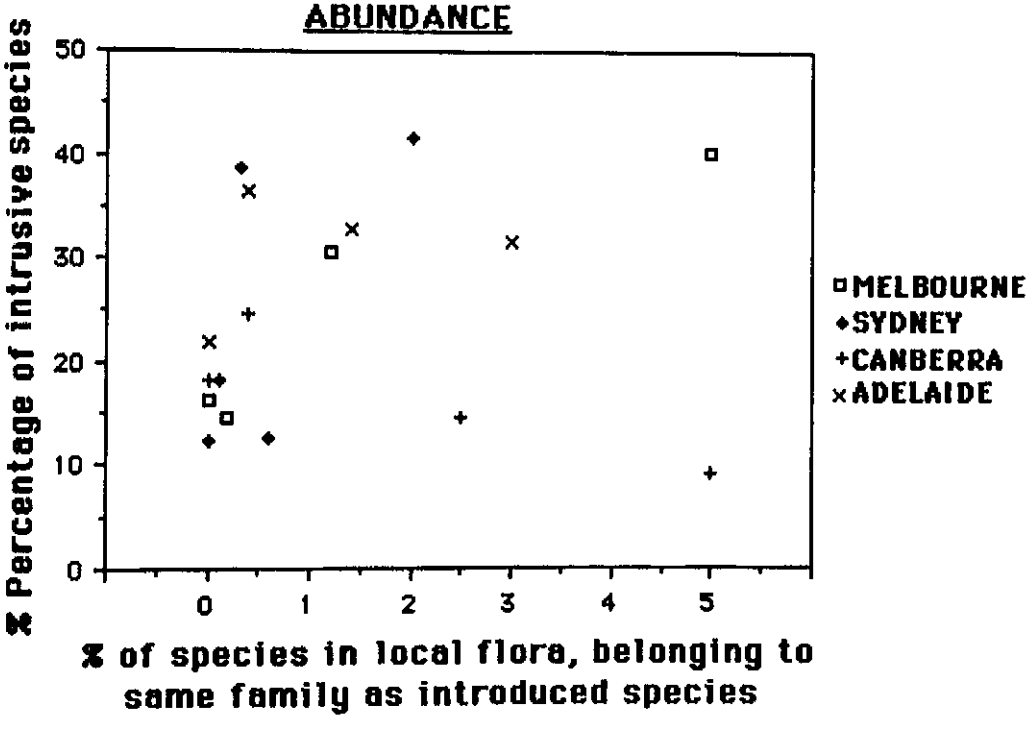


Table 6.4

FAMILY RELATEDNESS V'S INVASIVENESS

FAMILY RELATEDNESS		CITY			
		Adelaide	Canberra	Melbourne	Sydney
<0.2%	Invasive species	22	15	16	16
	Non-invasive	224	233	234	213
>0.2%	Invasive species	24	21	28	33
	Non-invasive	189	212	201	210
CHI - SQUARED df = 1		0.884	1.080	4.910	5.831
SIGNIFICANCE		N.S.	N.S.	P<0.05	P<0.05

Table 6.5

FAMILY RELATEDNESS V'S INTRUSIVENESS

FAMILY RELATEDNESS		CITY			
		Adelaide	Canberra	Melbourne	Sydney
<0.2%	Intrusive species	53	40	39	33
	Non-intrusive	193	206	211	196
>0.2%	Intrusive species	87	44	73	98
	Non-intrusive	126	189	156	145
CHI - SQUARED df = 1		20.00	0.519	16.87	40.64
SIGNIFICANCE		P<0.001	N.S.	P<0.001	P<0.001

Table 6.6 GENERIC RELATEDNESS V'S INVASIVENESS

		ADELAIDE	CANBERRA	MELBOURNE	SYDNEY
GENUS FOUND IN LOCAL FLORA	INVASIVE	9	4	6	8
	NON-INVASIVE	76	98	80	71
GENUS ALIEN TO LOCAL FLORA	INVASIVE	35	32	38	41
	NON-INVASIVE	338	341	355	352
CHI-SQUARED (df=1)		0.12	2.71	0.67	0
SIGNIFICANCE		N.S	N.S	N.S	N.S

Table 6.7 GENERIC RELATEDNESS V'S INTRUSIVENESS

		ADELAIDE	CANBERRA	MELBOURNE	SYDNEY
GENUS FOUND IN LOCAL FLORA	INTRUSIVE	38	10	28	24
	NON-INTRUSIVE	48	92	58	55
GENUS ALIEN TO LOCAL FLORA	INTRUSIVE	92	74	84	107
	NON-INTRUSIVE	281	303	309	286
CHI-SQUARED (df =1)		14.05	5.34	5.08	0.30
SIGNIFICANCE		P<0.001	P<0.05	P<0.05	N.S.

given the above results and the proven ability of eucalypts to become invasive outside Australia (Wells et al. 1986).

Within South-eastern Australia, proximity in family or generic relations is not convincingly correlated with the invasiveness or intrusiveness of introduced woody plants. There is statistically significant evidence, however, that introduced species with a related species present in the local flora are most likely to be intrusive. These findings are opposite to that which would be expected if local parasites, pathogens and predators were constraining plant invasions. It must be appreciated, however, that these results may be because not all plant/animal relationships are harmful. Being a compatible plant may mean better service from pollination, dispersal, microrhyssial, or nitrogen fixing organisms.

Pimentel (1977) argues that a species in its native range is attacked by predators with which it has had long evolutionary associations. When introduced to a new area, it has never before been exposed to the organisms in the biotic community, and consequently it lacks natural resistance to any potential parasite or predator. Perhaps related species are at an advantage because they have some resistance to potential enemies. This seems unlikely, however, as the most spectacular examples of plant hosts lacking resistance to a predator, involve predators that have switched from a closely related host species (Pimentel 1977, 1984, Hokkanen and Pimentel 1984).

Another explanation may be that there has been insufficient time for native herbivores to adapt their feeding to an introduced plant, but this has not been the case in crop situations (Strong 1974, Strong et al. 1977, McCoy and Rey 1983). It should be remembered, however, that the introductions studied were all in urban areas, where the native flora and fauna have been decimated. It is possible that many native herbivores rapidly became extinct in the areas where most of the introductions occurred.

Another factor that may blur results is that many introduced species have been introduced with, or later reunited with, insects and microbes of their native range. Although no native herbivorous insects are known to attack *Quercus suber* in Australia, one introduced species causes more damage to

its leaves, than from six native species attacking its leaves in California (Conner et al. 1980).

Obviously more research needs to be done on the effects of native herbivores which attack and possibly control introduced woody plants, and whether related plants are more likely to be subject to their attacks. Even so, it cannot be a factor of overriding importance to the invasive potential of woody plants in South-eastern Australia.

6.4 Competition from local plants.

In addition to the herbivores, pathogens and parasites, the other element of the biotic environment that must be overcome by a potentially invasive species, is competition from other plants. A species will be able to invade a community, either because it is a strong competitor and can eliminate or displace native species from the physical resources and biological relationships they hold (their niche), or because there are gaps waiting to be filled within a community (Cox and Moore 1986 p91). These gaps may be permanent, or temporary disturbance may create spaces. It seems probable that, of potentially invasive species, those simply filling a vacancy within a community would be more successful than those that have to contest a place. Certainly several authors have attributed the successful establishment of a plant to the lack of competition from other plants. Examples include *Poa pratensis* in North American grasslands (Bazzaz 1986), and trees in the South African fynbos (Macdonald and Richardson 1986).

In order to test the vacant niche hypothesis, one would need to identify those vacant niches within a community and those introduced species that could take advantage of these vacancies. Unfortunately no one has been able to *"establish a vacant niche except by carrying out the tautological experiment of introducing a species and seeing if it becomes established."* (Crawley 1987).

Despite this inability to identify a vacant niche, it still may be possible to distinguish which introduced species are likely to face the toughiest competition from local species. A common, but little tested assumption of competition theory, is that competition is most intense between ecologically similar species (Connell 1983, Schoener 1983, Moulton and Pimm 1986(b), Cody 1986, Grubb 1986). Ecological similarity has been measured by closeness

of taxonomic relation and morphological similarity (Lack 1944, Macarthur 1958, Cody 1986). However, competition may occur between organisms of divergent taxa and form, such as *Plantago lanceolata* and grass species (Harper 1977) and rodents and ants (Brown and Davidson 1977).

In a unique test of the competitive importance of ecological similarity, Moulton and Pimm (1986(b)) found that the presence of congeners, per se., did not reduce the likelihood of birds establishing on the Hawaiian Islands. However, the presence of a congener with similar morphology (bill size), significantly reduces the chance of a successful species establishment. Diamond and Case (1986) suggest that the same pattern applies to species introduced by natural invasions or speciation. They cite references pertaining to West Indian birds, Galapagos finches, New Guinea birds, geckos, parasitic wasps, iguanid lizards, and rats, where congeners with similar morphologies simply do not co-exist.

Thus it appears that ecological similarity, and presumably exclusion by competition, are important to some animal species. In order to test whether competitive exclusion is relevant to the establishment of woody plants in South-eastern Australia, one first needs a measure of morphological similarity between woody plants. One of the most noticeable features of plant morphology is the convergence of unrelated species to structural - functional forms, or life- forms, in widely separated but physically similar habitats. Cody (1986) found that desert shrubs of a similar lifeform (root structure) do not coexist, while those of different lifeform do. He claims that differences in lifeforms represent differences in strategies of light, water, and nutrient collection. Plants of a particular lifeform are committed to a certain mode of resource utilization, so that competition will be greatest within, rather than between lifeforms. Grubb (1986 p268) also believes that *"plants representing different scales of organization may fairly readily co-exist."*

The use of lifeforms for the comparison of morphological similarity, possesses two major advantages: Firstly the whole or most of the plant is usually considered, and secondly, existing lifeform classifications make the task relatively easy.

If exclusion by competition is important for the ability of a species to become invasive in South-eastern Australia, then higher than expected numbers of introduced woody species with lifeforms not, or only rarely represented, in the local flora, should be invasive. Species of lifeforms that are common amongst the local flora, should be poorly represented as invasive species. For those introduced species possessing a close taxonomic relative of identical lifeform, this should prove especially the case.

There are several lifeform classifications available for comparing morphological similarity. Some of the more well known schemes are those of Raunkier (1934), Mueller-Dombois and Ellenberg (1974), and Whittaker (1975).

One of the problems, in comparing the ability of certain lifeforms to become invasive, is that a strong correlation exists between climate and lifeform. Certain lifeforms will not be invasive in South-eastern Australia simply because the climate is unsuitable. The information gained in chapter 5.3 suggests that a tropical lifeform, with large coriaceous leaves and a shallow lateral root system, will fail to establish in the bushland of Adelaide, Canberra, and Melbourne. For this reason the lifeform classification of Box(1981(a)) is the most appropriate classification, as it is the only one which includes modelling of which lifeforms should exist under certain climatic regimes. Given that climatic matching has been found to be an important factor in a plant invasive ability, it is perhaps a poor reflection on Box's system that the differences between the number of invasive and intrusive species, amongst climatically matched and unmatched lifeforms, are fairly insignificant (tables 6.8 and 6.9). Even so, the results are in agreement with those of chapter 5, in that climatic matching has been most important in Adelaide.

Box's classification is an elaboration of the Mueller-Dombois and Ellenberg (1974) system, and includes ninety lifeform types and sub-types. Thirty nine of these lifeform types occur among the top 500 woody species most/longest planted in the capital cities of mainland South-eastern Australia. Box obtained the climatic tolerance of each lifeform type by combining the maximum and minimum values of eight macro-climatic variables. The variables used were intended to express the most important aspects of annual temperature, precipitation, and evaporation (Box 1981(a) p31). They

Table 6.8 LIFE FORM AND BOX'S CLIMATIC SUITABILITY V'S INVASIVENESS

	ADELAIDE		CANBERRA		MELBOURNE		SYDNEY	
	CM	UM	CM	UM	CM	UM	CM	UM
NUMBER OF INVASIVE SPECIES	37(30)	11(18)	31(28)	5(8)	28(28)	11(11)	39(39)	4(4)
NUMBER OF NON-INVASIVE SPECIES	265(272)	171(164)	351(354)	108(105)	336(336)	133(133)	394(394)	40(40)
CHI STAT. SIGN.	4.833 P < 0.05		1.556 N.S.		0 N.S.		0 N.S.	

Table 6.9 LIFE FORM AND BOX'S CLIMATIC SUITABILITY V'S INTRUSIVENESS

	ADELAIDE		CANBERRA		MELBOURNE		SYDNEY	
	CM	UM	CM	UM	CM	UM	CM	UM
NUMBER OF INTRUSIVE SPECIES	79(69)	31(41)	67(59)	10(18)	60(58)	21(23)	89(87)	7(9)
NUMBER OF NON-INTRUSIVE SPECIES	223(233)	151(141)	315(323)	103(95)	304(306)	123(121)	344(346)	37(35)
CHI STAT. SIGN.	5.026 P<0.05		5.506 P<0.05		0.2888 N.S.		0.615 N.S.	

CM = SPECIES OF LIFEFORMS WHICH, ACCORDING TO BOX'S MODEL, ARE SUITED TO THE CLIMATE OF A CAPITAL CITY (CLIMATICALLY MATCHED)

UM = SPECIES OF LIFEFORMS WHICH, ACCORDING TO BOX'S MODEL, ARE NOT SUITED TO THE CLIMATE OF A CAPITAL CITY (UNMATCHED)

included mean annual precipitation, Thornthwaite's measure of potential evaporation, the range of mean monthly temperatures, and measures of extreme mean monthly values of temperature and precipitation.

By combining the climatic variables, Box (1981(a)) was able to predict successfully the lifeforms present at 1225 global sites, with an 85% accuracy. Box claims that incorrect predictions owe much to topographic and historical factors. He gives as an example the prediction that bush stem succulents should be an important lifeform throughout much of Australia, whereas he notes that Australia has only one insignificant bush stem succulent *(Sarcostemma australis)*. When Opuntia species were introduced to Australia, however, they flourished (Box 1981(a) p64). Box's claim about *Sarcostemma* is incorrect. There are many Australian salt marsh species that have a bush stem succulent lifeform. Examples include *Sarcocornia, Salicornia* and *Suaeda*. Nevertheless the prediction that Opuntia would be an invasive lifeform is worth following further.

The woody lifeforms introduced into South-eastern Australia, together with the suitability of the climate of the capital cities to these lifeforms, are shown in table 6.10. The comparative number of species of a particular lifeform present in the local flora are also listed. If exclusion by competition is a factor influencing invasiveness, then climatically matched lifeforms with no local representatives should be the most invasive. As shown in table 6.10, these lifeforms are largely deciduous broad leaved trees, small trees, shrubs, or vines. One also would expect that lifeforms well represented in the local floras, such as temperate evergreen sclerophyll trees (eucalypts), temperate broad evergreen small trees (some *Acacia, Hakea , Leptospermum spp.)*, Mediterranean evergreen shrubs (*Prostanthera*, many Fabaceae), or broad evergreen vines (*Hardenbergia*), would be largely uninvasive. As shown in tables 6.11 to 6.12, however, there is virtually no relationship between invasive or intrusive occurrence, and presence of a comparable lifeform in the local flora. The one exception is for Adelaide, where species of lifeforms represented in the local flora are less likely to be intrusive.

In table 6.13 morphological similarity has been combined with taxonomic similarity (i.e, being of the same genus). Again, no significant relationships were found. The one exception occurs in Sydney, where greater than

Table 6.10 LIFEFORMS, THEIR LOCAL OCCURRENCE AND SUITABILITY OF CLIMATE

LIFE FORM	CLIMATE SUITABLE FOR LIFE FORM A	C	M	S	NUMBER OF SPECIES IN LOCAL FLORA A	C	M	S	LIFEFORM EXAMPLES
TROPICAL RAINFOREST TREES					0	0	0	6	Ficus macrophylla
TROPICAL EVERGREEN MICROPHYLL TREE				*	0	0	1	6	Grevillea robusta
TROPICAL EVERGREEN SCLEROPHYLL TREE	*		*	*	6	6	6	6	eucalypts, Tristania sp.
WARM TEMPERATE BROAD-EVERGREEN TREE				*	0	0	0	1	Cornus florida
MEDITERRANEAN BROAD-EVERGREEN TREE	*	*	*		1	0	1	1	Olea sp., Arbutus sp.
TEMPERATE BROAD RAINFOREST TREE				*	0	0	6	6	Magnolia grandiflora
SUMMERGREEN BROAD LEAVED TREE		*	*	*	0	0	0	0	Betula sp., Ulmus sp.
TROPICAL LINEAR LEAVED TREE	*		*	*	0	0	0	0	Araucaria cuminghamii
TEMPERATE RAINFOREST NEEDLE TREE				*	0	0	0	0	Sequoia sempervirens
MEDITERRANEAN NEEDLE LEAVED TREE					1	0	1	0	Cupressus macrocarpa
HELIOPHILIC LONG-NEEDLE TREE				*	0	1	1	1	Casuarina sp.
TEMPERATE NEEDLE TREE	*	*	*	*	0	0	0	1	Pinus ponderosa
BOREAL/MONTANE SHORT NEEDLED TREE					0	0	0	0	Picea sp., Abies sp.
SWAMP SUMMERGREEN NEEDLE TREE				*	0	0	0	0	Taxodium distichum
BOREAL SUMMERGREEN NEEDLE TREE					0	0	0	0	Larix sp.
TROPICAL BROAD EVERGREEN SMALL TREE				*	1	0	6	6	Hibiscus rosa-sinensis
TROPICAL CLOUD FOREST DRAWF TREE					0	0	0	0	Erica arborea
TEMP. BROAD EVERGREEN SMALL TREE	*	*	*	*	6	6	6	6	Hakea laurina
BROAD SUMMERGREEN SMALL TREE	*	*	*	*	0	0	0	0	Prunus persica, Malus sp
NEEDLE LEAVED SMALL TREE	*	*	*	*	6	1	6	6	Hakea sericea,
PALMIFORM TUFT TREE	*			*	0	0	0	1	Howea sp., Phoenix sp.
PALMIFORM ROSETTE TREELET	*		*	*	0	0	0	1	Musa sp., Strelitzia sp.
TREE FERN				*	1	1	1	1	Dicksonia sp.
XERIC EVERGREEN TUFT TREELET	*		*		1	1	1	1	Yucca sp., Agave sp.
EVERGREEN GIANT SCRUB	*		*	*	1	0	1	1	mallee eucalypts
TROPICAL BROAD EVERGREEN SHRUB				*	1	0	6	6	Lantana camara
MEDITERRANEAN EVERGREEN SHRUB	*	*	*	*	6	6	6	6	Correa alba, Myrtus sp.
TEMPERATE BROAD EVERGREEN SHRUB	*	*	*	*	6	1	6	6	Rhododendron sp.
LEAF SUCCULENT EVERGREEN SHRUB					6	0	1	1	Senecio angulatus
BROAD SUMMERGREEN MESIC SHRUB	*	*	*	*	0	0	0	0	Spiraea sp. Rosa banksiae
NEEDLE LEAVED EVERGREEN SHRUB	*	*	*	*	6	6	6	6	Grevillea rosmarinifolia
MEDITERRANEAN DRAWF SHRUB	*	*	*		6	1	6	6	Juniperus horizontalis
TEMPERATE EVERGREEN DRAWF SHRUB	*	*	*	*	6	6	6	6	Cotoneaster horizontalis
BUSH STEM SUCCULENT	*	*	*	*	1	0	1	1	Opuntia sp.
ARBORESCENT GRASS				*	0	0	0	0	bamboo
TALL CANE GRAMINOID				*	1	1	1	1	Arundo donax
TROPICAL BROAD EVERGREEN LIANA				*	0	0	1	6	Bignonia capreolata
BROAD EVERGREEN VINE				*	6	6	6	6	Passiflora sp., Hedera
BROAD SUMMERGREEN VINE	*	*	*	*	0	0	0	0	Vitis sp, Wisteria sp.

A = Adelaide
C = Canberra
M = Melbourne
S = Sydney

* = climate suitable for life form
0 = No local representative of life form
1 = 1-5 species of a particular lifeform present in local flora
6 = > 5 species of a particular lifeform present in local flora

NOTE: LIFEFORM EXAMPLES ARE INDICATIVE OF LIFEFORM IN SOUTH-EASTERN AUSTRALIA ONLY.

Lifeforms for all the 500 most commonly planted species in each of the cities studied are given in appendix 7.

Table 6.11 PRESENCE OF SIMILAR LIFEFORM IN LOCAL FLORA V'S INVASIVENESS

	ADELAIDE		CANBERRA		MELBOURNE		SYDNEY	
NUMBER OF INVASIVE SPECIES	LA 23(16)	LP 4(8)	LA 17 (14)	LP 14(17)	LA 21 (19)	LP 10 (12)	LA 29(29)	LP 12 (12)
NUMBER OF NON-INVASIVE SPECIES	184(188)	91(87)	159(162)	206(203)	204(206)	127(125)	276(276)	116(116)
CHI STAT. SIGN.	3.268 N.S		1.272 N.S		0.590 N.S		0.000 N.S	

Table 6.12 PRESENCE OF SIMILAR LIFEFORM IN LOCAL FLORA V'S INTRUSIVENESS

	ADELAIDE		CANBERRA		MELBOURNE		SYDNEY	
NUMBER OF INTRUSIVE SPECIES	LA 23(16)	LP 15(25)	LA 37(30)	LP 30(37)	LA 45(38)	LP 15(28)	LA 61(60)	LP 24(25)
NUMBER OF NON-INTRUSIVE SPECIES	184(188)	91(87)	139(146)	190(193)	180(187)	122(115)	244(245)	104(103)
CHI STAT. SIGN.	7.96 P < 0.01		3.56 N.S		3.72 N.S		0.07 N.S	

LA = Lifeform of introduced species absent in local flora

LP = Lifeform of introduced species present in local flora

Table 6.13

THE INTRUSIVENESS OF INTRODUCED SPECIES OF THE SAME GENUS AND LIFEFORM AS A LOCAL SPECIES (G+L) V'S THAT OF SPECIES OF THE SAME GENUS BUT DIFFERENT LIFEFORM (G) AND THAT OF SPECIES WITH THE SAME LIFEFORM BUT DIFFERENT GENUS (L).

ADELAIDE	G + L MATCHING	G MATCHING	G + L MATCHING	L MATCHING
INTRUSIVE SPECIES	16(19)	13(10)	16(15)	47(48)
NON-INTRUSIVE SPECIES	34(33)	13(16)	34(35)	110(109)
CHI-SQUARED	2.208		0.1244	
SIGNIFICANCE	N.S.		N.S	

CANBERRA	G + L MATCHING	G MATCHING	G + L MATCHING	L MATCHING
INTRUSIVE SPECIES	8(8)	2(2)	8(11)	22(19)
NON-INTRUSIVE SPECIES	70 (70)	19(19)	70(67)	120(123)
CHI-SQUARED	0.000		1.4987	
SIGNIFICANCE	N.S.		N.S.	

MELBOURNE	G + L MATCHING	G MATCHING	G + L MATCHING	L MATCHING
INTRUSIVE SPECIES	14(12)	5(3)	14(10)	24(28)
NON-INTRUSIVE SPECIES	44(46)	10(12)	44(48)	143(139)
CHI-SQUARED	2.086		2.619	
SIGNIFICANCE	N.S		N.S	

SYDNEY	G + L MATCHING	G MATCHING	G + L MATCHING	L MATCHING
INTRUSIVE SPECIES	18(16)	4(2)	18(9)	42(51)
NON-INTRUSIVE SPECIES	28(30)	13(15)	28(37)	217(208)
CHI-SQUARED	1.649		13.48	
SIGNIFICANCE	N.S		P<0.001	

expected numbers of intrusive species occur amongst introduced species of the same genus and lifeform as a local species. This result is opposite to that expected if exclusion by competition was operating.

In table 6.3 it was also shown that introduced species of the same genus as a local species are neither less or more likely to become invasive.

An ecologically similar species was defined as an introduced species of the same genus and lifeform as a species present in the local flora. Whether this measure of ecological similarity reflects competitive intensity is open to question. It is clear, however, that unlike introduced birds of Hawaii, ecological similarity adds little to the prediction of future invasive species.

This conclusion is not surprising, given the different nature of animal and plant competition. Plants, unlike animals, compete for essentially the same resources; light, water, nutrients. In this context woody plants are less ecologically different than a similar guild of animal species. Woody plants, once established, are relatively immobile and are less likely than are animals, to meet and to come into conflict with a morphologically similar species of the same genus.

It is probable that temporary gaps, rather than permanent vacancies, will prove of greater importance to plants than animals. In the following chapter several features that influence a plant's ability to locate temporary gaps, such as dispersal mechanism, seed longevity and fecundity, are examined and found to be associated with invasiveness. However, ability to find temporary gaps is not the only explanation why these features are related to invasiveness.

6.5 Conclusions

It has proved difficult to investigate the relationship between the biotic environment from which an introduced plant originates, and the invasive potential of that plant. This is largely because of the lack of information about, or a methodology, that can be applied to determine the degree of competition between plants, or the intensity of predation suffered by an individual plant species.

Introduced species of similar lifeform and taxonomy to local species, theoretically those species that would face the toughiest competition and severest phytophagous attack from local biota, have proved to be neither more nor less likely to be invasive than are biologically dissimilar species.

Plant species that support the largest number of phytophagous species, i.e, those from large diverse families and widespread distributions, are likely to be invasive. There is no evidence available, however, that these correlations equate with causation, though it is possible that freedom from a severe biological burden is a factor enabling invasive occurrence in South-eastern Australia.

CHAPTER 7 PLANT ATTRIBUTES

Earlier chapters have examined historical and environmental plant backgrounds. This chapter will focus on the plants themselves. It endeavours to answer the question, whether any plant attributes or combination of attributes, can distinguish invasive from non-invasive woody ornamentals.

In all cases the approach taken is to collate information on which species possess a particular plant attribute and then test possession of this attribute against intrusive occurrence. Information on whether a particular species possesses a particular attribute is largely gleaned from world literature. Hence the approach assumes that a species will have the same attribute irrespective of global location. This will not always be the case, *Vinca major*, for example, is an outcrossing species in the Northern Hemisphere, but, from my observations in the field, appears only to produce asexually in South-eastern Australia. Thus the data to be tested probably contains inaccuracies. There is little option but to accept these inaccuracies and to be aware that they may influence results. Nevertheless the attribute data-sets established are generally large and robust.

Plant attributes can be recognised by phenotypic differences in structure, form and physiology, and by the way the genetic information determining phenotypic appearance, is passed from one generation to the next. Some of the genetic attributes are the first to be discussed and tested.

7.1 Genetic attributes.

All genetic systems must fulfil two conflicting requirements. On one hand they have to generate sufficient variation to enable a species to adapt to changing environments, while on the other hand the systems must be sufficiently conservative so that the most appropriate genotype is retained and multiplied. There are several factors which influence or regulate the amount of genetic variation within a species. The major factors are:

Mode of reproduction and Fertilisation: Mating systems without outcrossing, such as apomixis or self fertilisation, enhance immediate fitness at the expense of flexibility, which is a promoted by outbreeding.

Fecundity: A large population or seed output can be the repository of a much greater store of variability than a small population (Grant 1963 p427).

Pollen and seed dispersal: Wind pollinated/ seed dispersed plants, such as *Acer* (seed and pollen), *Coprosma* (pollen only), and *Bougainvillaea* (seed only), tend to produce vast quantities of pollen/seed that are often distributed over large areas, with the result that there is a large effective neighbourhood size, a small chance of inbreeding, and more intrapopulation variation. (Hamrick et al. 1979).

Chromosome number: A greater number of recombinations will arise if the genes are distributed among many chromosomes, than if they are grouped on a few. In an organism with a haploid number of 7 the number of possible chromosome combinations in the gametes is 128, but if n=14 the number of possible combinations is 16,384 (Grant 1975 i.e 2^n).

Chiasma frequency: The amount of crossing over, or exchange, between normally isolated chromosomes.

Chromosome size: The amount of crossing over, and the resulting effect of each cross over, will be affected by the size and the amount of DNA, i.e, genetic information, on the chromosomes (Gray 1986).

Generation length: Longevity ensures that many generations, and hence genetic combinations, are represented in one population (Hamrick et al. 1979).

Hybridization: Hybrids usually possess much genetic variability because they usually contain many chromosomes relative to the number possessed by original parents. Hybrid vigour may result because the large number of chromosomes has a buffering effect on certain deleterious gene combinations. Certainly a hybrid *Aronia X prunifolia*, is the most successful invader in the Netherlands (Weeda 1987), while *Grevillea X Canberra gem*, and various blackberry species are hybrids that have successfully invaded South-eastern Australia. However their invasive success may be due to other factors beside hybrid status.

In most plants the compromise between a need for genetic variation and a need for the conservation of a suited genotype, is reached by the possession of regulatory factors working in opposing directions. Oaks, as an example, cross fertilize and have wind borne pollen, but produce heavy seeds and have a low chromosome number. Gray (1986) argues that, because of this, studies that focus only on one aspect of the genetic system, rather than on interactions, will yield poor predictive generalisations of invasive potential. This ignores the possibility, however, that one or another aspect of the genetic system may have an overriding influence on invasiveness, and that aspects of the genetic system, such as mode of dispersal or reproduction, will have ecological implications beyond that which relate purely to genetic systems.

Numerous studies have focused on identifying an aspect of the genetic system that distinguishes species capable of spreading into new environments (see Baker and Stebbins 1965, Rice and Jain 1985, and Gray 1986, for reviews). These colonising species have been found to be predominantly self fertilised, or with vegetative reproduction (Mulligan 1965, Price and Jain 1981, Brown and Burdon 1987). Alternatively, if they are cross fertilized, they are pollinated by wind or unspecialized visitors (Baker 1974), while they are also likely to be polyploids (i.e, have many chromosomes) (Stebbins 1970), and have a large seed output (Baker 1974).

The studies of colonising species have mainly involved herbs, entering sparsely occupied, greatly disturbed habitats. Another important difference between these studies, and those of intrusive woody ornamentals, is that woody ornamentals are frequently introduced into an area in large numbers, and maintained in a nurtured garden environment. Consequently the ability to overcome founder effect problems, such as inbreeding, or a lack of a mate for cross- fertilization, are likely to be less important for garden plants than for other plants. The studies do suggest, however, that the fragmented study of the genetic system may provide further tools to aid in the identification of invasive woody ornamentals. The ideal approach would be to examine the regulatory factors of the genetic system, in toto, separately, or in different combinations. To a certain extent this is the approach adopted in this thesis. Unfortunately, not all the genetic information is known for all the woody ornamentals commonly planted in South-eastern Australia. Even straightforward information, like

chromosome number, is unknown for many species. There are no data at all on chiasma frequency, while the DNA content of chromosomes is known for only half a dozen of the common woody ornamentals of South-eastern Australia (Bennett and Smith 1976, Bennett, Smith and Heslop-Harrison 1982)

One way of considering a total genetic system is to compare the amount of genetic variation in different species. Hamrick et al. (1979) surveyed the literature for all electrophoretically determined measures of genetic variation. They located information on 113 plant species. Electrophoresis identifies different forms of protein, which reflect differences in the structure or coding of particular genes. These different forms of genes are termed alleles. Alleles occur at particular locations (loci) on the chromosomes. The percentage of polymorphic loci per population (P), and the number of alleles per locus(A), provide an index of genetic variation (PI). Hamrick et al. (1979) found that the species with the most genetic variation were those possessing large ranges, high fecundities, an outcrossing mode of reproduction, wind pollination, a long generation length and came from habitats in the later stages of succession.

Of the 113 plants Hamrick et al. (1979) studied, however, only thirteen were woody ornamental species, which have been commonly planted in South-eastern Australia, while only three have become intrusive. This study, however, contains information on the genetic variation within twenty-four woody ornamentals that have been planted in Australia, and that are listed in gardening guides for areas outside Australia (Liberty Hyde - Bailey Hortorium 1976, Bean 1974, Chittenden 1965). We may assume from this that they have had some degree of global planting.

In Table 7.1 the twenty-four species have been ranked according to their degree of genetic variation (PI), and records of a species being intrusive in any part of the world are also noted. It is evident that of the twenty-four species, ten are conifers, while nine species belong to the *Citrus* genus. When all twenty-four species are considered together, no significant difference is evident in levels of genetic variation between species that have been documented as intrusive and those which have not. Obviously this result is only as reliable as the documentation of intrusive species. When the *Citrus* species are examined separately, it can be seen that all the non-

Table 7.1 INTRUSIVENESS V'S AMOUNT OF GENETIC VARIATION

SPECIES NAME	PI	RANK	RECORD OF INTRUSIVENESS
Abies lasiocarpa	.399	16	
Citrus aurantiifolia	.250	9	West Indies (Harris 1962) Florida (Elias 1980)
Citrus aurantium	.154	5	
Citrus grandis	.049	2	
Citrus jambhiri	.500	21	Sydney (see Table 3.1)
Citrus limon	.499	20	Natal (Macdonald 1983) West Indies (Little et al. 1964)
Citrus paradisi	.125	4	
Citrus reticulata	.361	15	South Africa (Macdonald 1983)
Citrus sinensis	.310	11	Paraguay (Gade 1976) West Indies (Little et al. 1964)
Eucalyptus obliqua	.351	13	New Zealand (Healy 1972)
Eucalyptus pauciflora	.278	10	
Ficus carica	.530	23	Adelaide, Melbourne, Southern Europe (Tutin et al. 1964)
Larix decidua	.347	12	New Zealand (Healy 1972) Brindabella Mts. *
Persea americana	.195	7	Florida (Elias 1980)
Picea abies	.418	17	New Zealand (Hunter1984)
Picea engelmannii	.432	18	
Pinus rigida	.170	6	
Pinus pungens	1.440	24	
Pinus ponderosa	.226	8	New Zealand (Hunter 1984) Brindabella Mts. *
Pinus sylvestris	.359	14	N. Z.(Hunter 1984) North West Europe (Fitter 1978)
Poncirus trifoliata	.500	21	
Pseudotsuga menziesii	.436	19	N. Z.(Hunter 1984) Brindabella Mts. *

Wilcoxon Two-sample Test

Null Hypothesis: The mean PI values (Genetic Variation) are equal for intrusive and and non-intrusive plants.

R1=Sum of Intrusive species = 9+21+20+15+11+13+23+12+7+17+8+14+19 = 189

R2=Sum of Non-intrusive species= 16+5+2+3+4+10+18+6+24+1+21 = 110

U1 = 189 - (12x13x1/2) = 111 U2 = 110 - (11x12x1/2) = 44

α = 0.05 Critical region: $\leq$ 38

Conclusion: Accept null hypothesis, there is no significant difference in the genetic variation of intrusive and non-intrusive species, for those species listed in Hamrick et al 1979.

* PI = % of polymorphic loci per population X number of alleles per locus

* Escapee from Bendora arboreteum, Namadgi National Park, Australian Capital Territory. Specimens lodged at Rangers Office Bendora Dam, Namadgi National Park.

intrusive *Citrus* species rank lower than any of the intrusive *Citrus* species. Applying the Wilcoxon Two- sample Test, this give an U equal to zero, with the probability that U=0 being $P < 0.008$.

The total genetic variation , within woody ornamental species, has been so little studied that it is possible to say little more than that the degree of genetic variation contained within a conifer species does not seem to affect intrusive ability, while for the genus *Citrus* the reverse appears to be true. The factors contributing to genetic variation are next dissected to see if that approach can yield more information and identify the compromise position(s), between flexibility and conservation, which is most suited to an invasive ability.

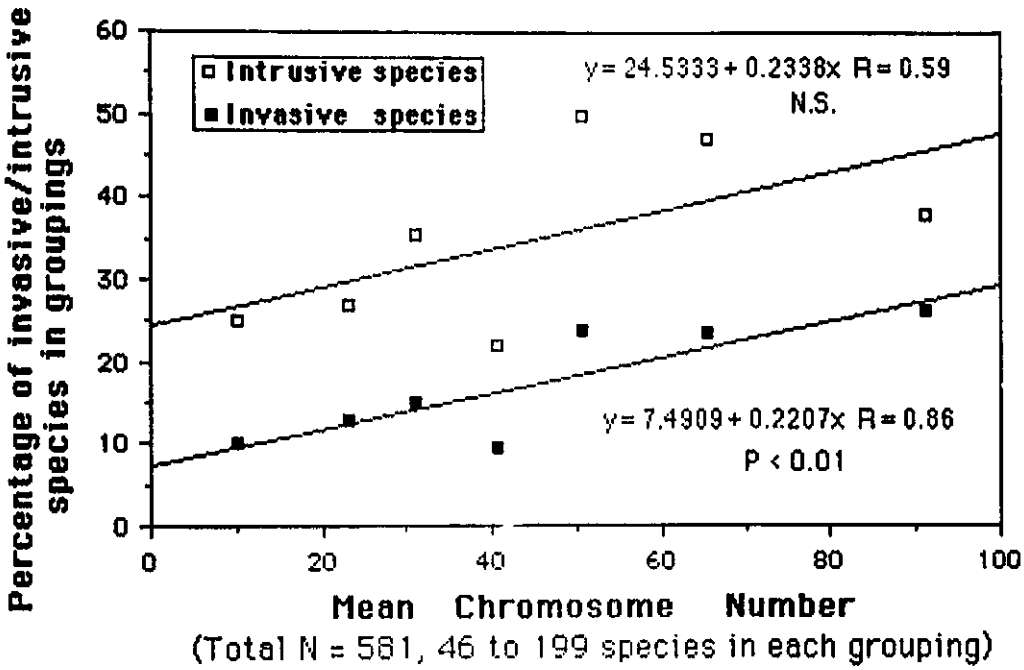
7.2 Chromosome number

Species with a large number of chromosomes are usually polyploids, having multiple copies of a primitive set of chromosomes. Grant (1963 p486), considers that the primitive basic chromosome numbers are n=7,8, or 9, and that as a rule of thumb, chromosome numbers from n=14 upwards are of polyploid origin. Goldblatt (1985), found that Grant's rule of thumb worked well for determining monocotyledon polyploids.

As well as having a high recombination induced variability, polyploids have the additional advantage that deleterious effects of certain herterozygous gene combinations are buffered by the extra chromosomes (Stebbins 1957). Most of the world's worst weeds are polyploids (Barrett 1982), and polyploids are frequently good colonisers (Hodgson 1987). Stebbins (1970) found that in twenty-eight genera polyploids invaded America from Europe, while related diploids did not; for only ten genera was the reverse true.

In Table 7.2, Grant's rule of thumb was used to distinguish polyploids. As can be seen, polyploidy does seem to be of some importance to the intrusiveness of woody ornamentals in South-eastern Australia, but not to the occurrence of invasive species. In Figure 7.1 however, it can been seen that there is a significant relationship between increasing chromosome number, and increasing probability that a species will be invasive.

Figure 7.1 : Chromosome Number V's Intrusiveness



(Total N = 581, 46 to 199 species in each grouping)

Table 7.2

INTRUSIVE/INVASIVE OCCURRENCE V's POLYPLOIDY

	Intrusive	Non-intrusive	Invasive	Non-invasive
Diploid	**74**(86)	**205**(193)	**34**(42)	**245**(237)
Polyploid	**109**(94)	**193**(208)	**53**(45)	**249**(257)

df = 1
X^2 = 5.895
P < 0.05

df = 1
X^2 = 3.464
P is N.S.

74 = observed number (86) = Expected number

7.3 Pollen dispersal/production

Nothofagus pollen is known to disperse over a distance of 4,000km, from South America to the South Atlantic island of Tristan da Cunha (Flenley 1973). However, pollen of most species will be dispersed close to the parent. Pollen size classes have been used as an indication of pollen's potential dispersion, with smaller classes considered to be dispersed by the wind over relatively large distances, while large pollen is considered to be animal dispersed, with only local distribution (Westman et al. 1975, Faegri and Pijl 1978). This division by size lacks precision as dispersion potential will be affected by the shape of the pollen, and whether, as for *Acacia*, individual pollen grains aggregate together (Hyde and Adams 1958). The quantity of pollen produced also will have important implications for the effective area over which it is dispersed.

For woody ornamentals planted in South-eastern Australia, pollen dispersion potential may be gauged more reliably than purely by pollen size. In the first place, the pollen dispersal of many of the species planted, has been examined in their native habitat, as part of modern pollen rain studies, aimed at providing information on the interpretation of fossil pollen assemblages (Janssen 1972, Davis and Webb 1975, Maher 1963, Tauber 1977, Delcourt et al. 1983). In addition, all of the cities for which planting data was obtained have been surveyed for quantities of airborne pollen in

attempts to determine the causes of allergenic diseases (Dodson 1983, Derrick 1966, Price 1963, Phillips 1941, Sands 1967).

The degree of pollen dispersal/production was divided into three classes;

1. **Low dispersion potential:** a pollen type that is present only in samples collected within vegetation in which it occurs, or was not recorded in the city pollen surveys of South-eastern Australia (e.g.*Banksia, Schinus, Malus).*
2. **Moderate dispersion potential**: species in which pollen occurs in vegetation adjacent to that in which it grows, or a species whose pollen was poorly represented in the city pollen surveys. (e.g *Betula, Tamarix, Eucalyptus)*
3. **High dispersion potential:** Species in which pollen occurs in almost all samples, or is well represented in the survey of airborne city pollen (e.g *Acer, Coprosma,* Cupressaceae).

Tables 7.3, and 7.4, demonstrate that there is no significant dependence between the degree of pollen dispersion potential, and an ability to spread from garden plantings.

7.4 Mode of Reproduction.

Information on mode of reproduction was obtained for 738 of the woody species commonly planted in South-eastern Australia. The major sources of information were Fryxell (1957), Gustafsson (1947), Nygen (1967), Hamrick et al. (1979) and Wells et al. (1986). None of the species are purely asexual, though a few, like *Agave americana* and *Vinca major*, seem, from field inspection of infertile flowers, to reproduce only by vegetative means in South-eastern Australia. In contrast, 587 of the species reproduce by purely sexual means. In table 7.5, it is apparent that species with some form of asexual reproduction are much more likely to be invasive than those only reproducing sexually.

Table 7.6 yields the surprising result that immigrant species are neither significantly less nor more likely to have the ability to reproduce asexually. This implies that for intrusive species in South-eastern Australia, the ability to become established in natural bushland is independent of mode of reproduction. Once established, however, the ability to become a dominant

Table 7.3: Invasiveness V's Pollen Dispersal

Pollen Type	No. of invasive species	No. of non-invasive species	Totals
1 Low dispersal	51 (60)	445 (436)	496
2 Moderate dispersal	24 (23)	171 (172)	195
3 High dispersal	25 (17)	114 (122)	139
Totals	100	730	830

$X^2 = 5.87$ df = 2 N.S. at 0.05 level

Table 7.4: Intrusiveness V's Pollen Dispersal

Pollen Type	No. of intrusive species	No. of non-intrusive species	Totals
1 Low dispersal	147 (156)	349 (340)	496
2 Moderate dispersal	70 (61)	125 (134)	195
3 High dispersal	44 (44)	95 (95)	139
Totals	261	569	830

$X^2 = 2.688$ df = 2 N.S. at 0.05 level

Table 7.5: Invasiveness V's Mode of Reproduction

MODE OF REPRODUCTION	NO. OF INVASIVE SPECIES	NO. OF NON-INVASIVE SPECIES	TOTALS
SEXUAL	48 (81)	539 (506)	587
SEXUAL + VEGETATIVE OR VEGE. ONLY (AGAVE)	43 (15)	62 (90)	105
SEXUAL + APOMITIC	7 (4)	25 (28)	32
SEXUAL + APOMITIC + VEGETATIVE	4 (2)	10 (12)	14
TOTALS	102	636	738

$X^2 = 81.29$ df = 3 P < 0.001

Table 7.6 Immigrant status V's Mode of Reproduction

MODE OF REPRODUCTION	No. of Immigrant species	No. of Non-Immigrant species	TOTALS
SEXUAL	110 (119)	477 (468)	587
SEXUAL + VEGETATIVE OR VEGE. ONLY (AGAVE)	27 (21)	78 (84)	105
SEXUAL + APOMITIC	9 (6)	23 (26)	32
SEXUAL + APOMITIC + VEGETATIVE	3 (3)	11 (11)	14
TOTALS	102	636	738

$X^2 = 4.837$ df = 3 N.S. At 0.05 level

species in an area of at least 20m x 20m (i.e, invasive) is greatly enhanced by an ability to reproduce asexually.

This thesis distinguished invasive species through an area criteria (i.e, dominant in an area of 20m x 20m), which possibly biases towards recording vegetative reproducers, as many of these species tend to spread in a "mother and babies" clumped fashion, while invasive sexual plants are more widely dispersed. Nevertheless, the ability of a parent plant to support clumped offspring, during the vulnerable early stages of their growth, through a system of root suckers or rooting shoots, appears to be a successful strategy for a significant spread into natural bushland.

Two reasons, parental support and replication of a successful genotype, have been put forward to explain why asexual plants are likely to be invasive. Further possible explanations are that vegetative reproduction is frequently rapid; that the production of vegetative propagules usually diversifies the dispersal agents employed by a plant species; and that vegetative propagules are often larger and provide more nutrient support to young seedlings than sexual propagules. Baker (1967) also postulated that asexual reproduction would allow persistence and spread of an isolated single individual that had dispersed over a long distance.

7.5 Mode of Fertilisation.

Self-fertilising species are common as colonizers (Baker 1965). Rationales for this include the advantage that selfing allows seed-set when pollination is unreliable or populations are low; it avoids disruption of a successful genotype, and reduces the costs of mating with physiological savings being converted to increased fecundity (Wilson 1983 p97). The major references for determining mode of fertilisation in the woody species under examination were East (1940), Hickey and King (1981).

In Table 7.7 it is clear that very few, or about only three percent, of the woody species commonly planted in South-eastern Australia are predominantly self- fertilised. This is not surprising when the advantages of selfing are seen to be greatest for species with short life-cycles, namely annual species (Solbrig 1976, Symonides 1988). There is no significant dependence between invasiveness or immigrant status and whether a

Table 7.7 Invasiveness V's Mode of Fertilisation

MODE OF FERTILISATION	NO. OF INVASIVE SPECIES	NO. OF NON-INVASIVE SPECIES	TOTALS
CROSS FERTILISED	35 (32)	294 (297)	329
CROSS + SELF FERTILISED	34 (37)	340 (337)	374
SELF FERTILISED	2 (2)	18 (18)	20
TOTALS	71	652	723

$X^2 = 0.5802$ df = 2 N.S. at 0.05 level

Table 7.8 Immigrant status V's Mode of Fertilisation

MODE OF FERTILISATION	No. of Immigrant species	No. of Non-Immigrant species	TOTALS
CROSS FERTILISED	296 (285)	33 (44)	329
CROSS + SELF FERTILISED	316 (324)	58 (50)	374
SELF FERTILISED	15 (17)	5 (3)	20
TOTALS	627	96	723

$X^2 = 6.2198$ df = 2 N.S. at 0.05 level

species is predominantly cross, self, or both cross and self fertilised (Tables 7.7, 7.8).

Dioecious plants, possessing sexes separated in different plants, are obligatory outbreeders. However, leaky dioeciousism, where plants of a dioecious species occasionally become bisexual, may occur (Baker and Cox 1984). Falinski (1980) notes that pioneer woody plants in disturbed areas of Poland are frequently dioecious, examples including species of *Salix*, *Juniperus*, and *Populus*. In Table 7.9 woody dioecious plants commonly planted in South-eastern Australia are compared with all non-dioecious common plantings.

Table 7.9. Intrusiveness and Dioecious Status

	Invasive	Non-invasive	Immigrant	Non-immigrant
Dioecious species	**13**(5)	**36**(44)	**7**(7)	**42**(42)
Non-Dioecious species	**58**(66)	**616**(608)	**89**(89)	**585**(585)
Chi-square		**15.32**		**0**
Significance		**P<0.001**		**N.S**

The results are similar to those obtained when vegetative species are compared with non-vegetative species (Tables 7.5 and 7.6), with invasiveness being dependent on dioecious status, but with immigrant status independent of dioeciousism. The similarity of the results is expected, given that these dioecious species frequently also have an ability to reproduce asexually (Table 7.10). These dioecious species are prime examples of strategies balancing the need for genetic variation with the need for genetic conservatism. For woody plants, the combination of dioecy with vegetative reproduction seems to be one that characterises invasive species.

Table 7.10. Dioecious status and Asexual Reproduction.

	Dioecious	Non-dioecious
Sexual Reproduction only	**28** (39)	**559** (548)
Asexual reproduction	**21** (10)	**126** (137)
Chi-square	**16.306**	
Significance	**P < 0.001**	

7.6 Seed/Propagule Dispersal.

The distance of seed/propagule dispersal varies markedly among woody species, from a matter of metres (as is the case with the ballistic dispersal of *Bauhinia* seed), to kilometres (as is the case of the small wind dispersed seeds of *Betula*). There are several dispersal agents exploited by plants, and the dependence of plants on a particular type(s) of dispersal agent greatly affects the distance over which it is disseminated. The main references used to determine the dispersal agent(s) employed by the woody species examined were Ridley(1930) and Pijl (1982). Unfortunately for this study, the type of dispersal employed by many of the woody species commonly planted in South-eastern Australia has not been recorded. In determining the dispersal syndromes of fossil plants, Tiffney (1986) used fruit and seed morphology as a guide in distinguishing dispersal type. The criteria employed in this thesis to determine unrecorded dispersal agents, are adapted from Tiffney's (1986) classification (see Table 7.11).

Although fruit and seed morphology may indicate which type of dispersal agent is predominantly employed by a plant species, it tells little about unusual dispersal events that may have consequences for the intrusiveness of a species. As an example, most of the conifers commonly planted in South-eastern Australia have seed dispersed by wind. Their seed cones also may be occasionally dispersed by cockatoos and parrots. The small flat seeds of *Betula* are readily dispersed on the wheels and body of motor-cars (Wace 1977), while, as a final extreme example, *Quercus ilex* is only known to be invasive in one area of bushland, in South-eastern Australia, which backs onto Campbell High School, Canberra. Does it's localised invasive occurrence only testify to past battlegrounds, when children threw acorns in fights?

Table 7.11 Dispersal Agent and Seed/Fruit Morphology.

(after Tiffney 1986)

DISPERSAL AGENT	DISPERSABILITY	DISTINGUISHING FEATURES
WIND (LIGHT)	HIGH	Minute seeds less than 15mg in weight, or up to 25mg if seed is winged or hairy.
WIND (HEAVY)	MODERATE	Seeds >25mg that are winged, hairy or have a large surface area to volume ratio.
WATER	HIGH	Mainly determined from literature reference, but adaptations include buoyant seeds with hard seed coat
BALLISTIC	LOW	Seed contained within an explosive capsule or pod
ANT	LOW	Seed with an oily or fat rich elaiosome
BIRD (INTERNAL)	MODERATE	Seed contined within an odourless fruit to 2.5cm in diameter
MAMMAL + REPTILE (INTERNAL)	MODERATE	Seed contained within a strong smelling fruit, that is greater than 2.5cm in diameter
CACHE (BIRD + MAMMAL)	LOW	Fruit or seed a large nut, which is collected and hoarded by rodents or birds

Note 1. 15mg and 25mg are arbitrary measures, chosen because seeds either side of these weights generally correspond well with recorded distances of wind dispersal (Ridley 1930, Salisbury 1942, United States Forest Service 1948)

Note 2. A fruit size of 2.5cm was choosen to distinguish between fruits dispersed by mammals and birds as this seems to be the limit of fruit taken by the Currawong (*Strepera graculina*), which is the largest flying frugivore in South-eastern Australia

Note 3. There are no documentations of any of the woody plants being predominately dispersed externally, on the furs or feathurs of fauna, and as far as could be ascertained none of the fruits or seeds are particularly sticky or possesshooks or stiff hairs. The persistent calyx of many Rosaceae species may, however, aid their dispersion in this fashion.

Table 7.12 Mode of Dispersal V's Invasiveness

MODE OF DISPERSAL	NO. OF INVASIVE SPECIES	NO.OF NON-INVASIVE SPECIES	Chi-square
WIND(LIGHT)	20 (25)	148 (143)	1.175
WIND(HEAVY)	7 (7)	43 (43)	0
WATER + WATER/WIND	7 (4)	20 (23)	2.64
WIND + BALLISTIC	2 (6)	36 (32)	2.75
BALLISTIC	4 (4)	23 (23)	0
BALLISTIC + ANT	5 (3)	17 (19)	1.543
WIND/ANT +ANT + ANT/BIRD	9 (5)	25 (29)	3.752
BIRD	40 (33)	184 (191)	1.741
MAMMAL +REPTILE	2 (6)	39 (35)	3.123
CACHE + CACHE/WIND	2 (5)	29 (26)	2.146

$X^2 = 18.869$

df = 9

P < 0.05

Table 7.13 Mode of Dispersal V's Immigrant Status

MODE OF DISPERSAL	No. of Immigrant species		No. of Non-Immigrant species		CHI-SQUARE
WIND(LIGHT)	21	(34)	147	(134)	6.232
WIND(HEAVY)	5	(10)	45	(40)	3.125
WATER + WATER/WIND	4	(5)	23	(22)	0.245
WIND + BALLISTIC	15	(8)	23	(30)	7.758
BALLISTIC	5	(5)	22	(22)	0
BALLISTIC + ANT	5	(4)	17	(18)	0.305
WIND/ANT +ANT + ANT/BIRD	6	(7)	18	(19)	0.1954
BIRD	50	(45)	174	(179)	0.6952
MAMMAL +REPTILE	9	(8)	32	(33)	0.030
CACHE + CACHE/WIND	3	(6)	28	(25)	1.86

$X = 20.4456$

$df = 9$

$P < 0.05$

Table 7.12 establishes that invasiveness is dependent on the type of predominant dispersal agent employed by a plant species. Species dispersed by ants are significantly more likely to be invasive, while species with large fruits that are cached or dispersed by mammals are significantly uninvasive (Tables 7.14, 7.15). When immigrant status is tested against dispersal type, those species that are only dispersed by wind are significantly less likely to be immigrants, while those species that combine ballistic and wind dispersal are most likely to be immigrants (Table 7.13).

The conclusion is that intrusiveness is not related to distance of dispersal (dispersion potential) *per se*. Woody ornamental plants may be a special case however, distinguishing them from other plant groupings. Their wide planting may negate any advantage achieved in obtaining a large neighbourhood size through widespread dispersal.

Table 7.14. Invasiveness and Ant Dispersal

	Invasive	Non-invasive
Ant dispersed species	**14**(8)	**42**(48)
Non-ant dispersed species	**84**(90)	**522**(516)
Chi-square	**5.719**	
Significance	**P < 0.05**	

Table 7.15. Invasiveness and Mammal/Cache Dispersal

	Invasive	Non-invasive
Mammal/cache dispersed	**4**(11)	**68**(61)
Non-mammal/cache dispersed	**94**(87)	**496**(503)
Chi-square	**5.914**	
Significance	**P < 0.05**	

An explanation why species dispersed by ants (myrmecochores) are more likely to be invasive than mammal and cache dispersed species, may relate to the availability of dispersal agents. South-eastern Australia lacks any cache hoarding large rodents or birds, while mammal dispersed species must rely on possums, the introduced European fox, and possibly the feral pig, none of which is predominantly frugivorous. Pigs and foxes are also uncommon in urban bushland. On the other hand South-eastern Australia has a diverse and abundant foraging ant fauna (Berg 1975), with individual

ant species dispersing a range of seed sizes belonging to a large number of species (Westoby et al. 1982), so that introduced ant dispersed flora is likely to be dispersed by the native fauna. Australia has approximately 3000 myrmecochores, compared with 1000 in South Africa and only 300 recorded species throughout the rest of the world (Buckley 1982). Smith (1989) records the dispersal of seed from two non-local plant species, *Viola odorata* and *Grevillea rosmarinifolia* by the indigenous meat ant *Iridomymex purpureus*, in the Armidale area.

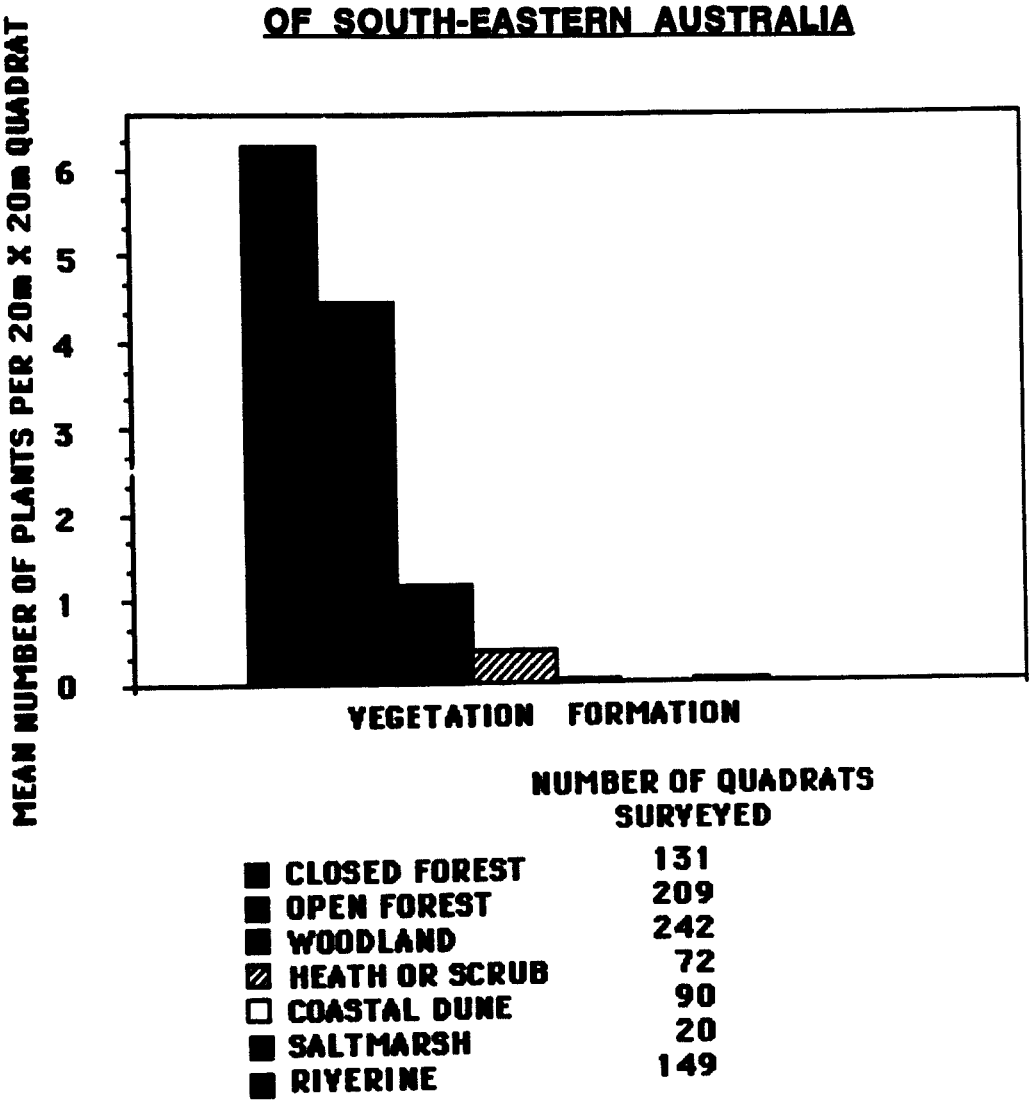
The majority of Australian and South African myrmecochores are sclerophyll shrubs, which occur in fire prone vegetation on infertile soils (Berg 1975, Westoby et al. 1982, Milewski and Bond 1982). Reasons given for this association include the following factors: that ants may place seeds at a depth in the soil which protects them from fire; it requires small nutrient resources to produce seeds attractive to ants; and that myrmecochory is not a viable strategy unless the seed itself is protected from being eaten, a hard testa both provides this protection, while also imposing dormancy that is commonly broken by fire (Westoby et al. 1982).

These reasons explain why myrmecochores can occur in fire-prone areas of infertile soil, but not why they may occur elsewhere. If the myrmecochore strategy is not as competitive as other dispersal strategies, outside fire prone infertile areas, then one would expect that introduced species dispersed by ants would be largely confined to fire prone areas.

In Chapter Three, it was explained how 941, 20m x 20m quadrats, in transects of usually 200m length, were surveyed in the bushland of Adelaide, Canberra and Melbourne, to determine the relative occurrence of individual invasive woody species. Figure 7.2 illustrates the average number of introduced myrmecochores (including seedlings), in the 20m x 20m quadrats of a particular vegetation formation.

No intrusive myrmecochore plants were recorded in the 75 heath or scrub quadrats, which would be the most fire prone and nutrient poor areas. They were, however, most frequently recorded in areas of closed or open eucalypt forest, which are more fire prone and nutrient poor than woodland or riverine habitats. Certainly myrmecochore species are more invasive in the fire prone Mount Lofty Ranges, than any where else in South-eastern

Figure 7.2 THE OCCURRENCE OF INTRODUCED ANT DISPERSED SPECIES IN VEGETATION FORMATIONS OF SOUTH-EASTERN AUSTRALIA



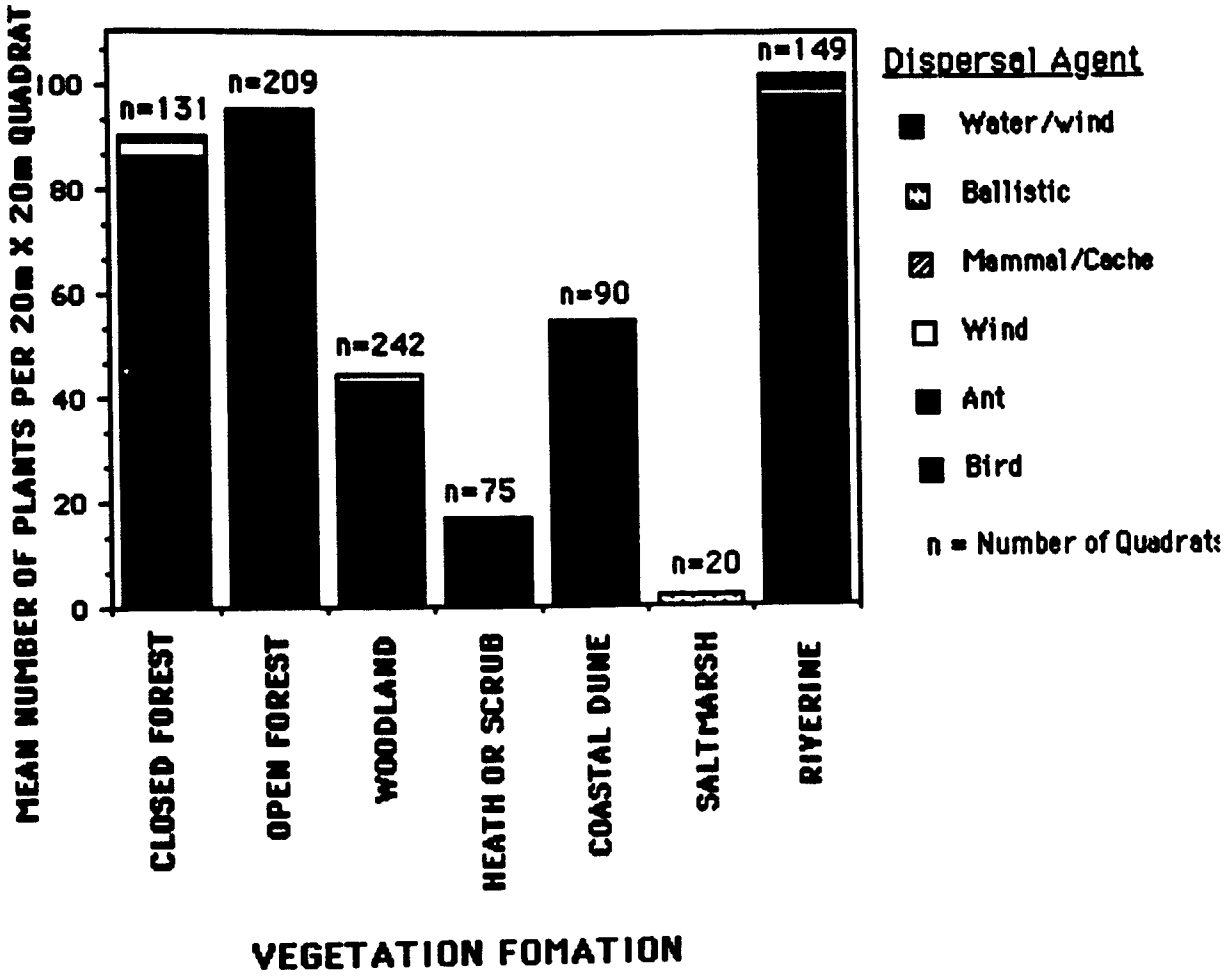
Australia. Cochrane (1963) found that in the forest fire areas of the Mount Lofty Ranges, myrmecochore invaders such as *Cytisus scoparius, Spartium junceum, Ulex europaeus,* and *Genista* species, form a more dense and higher shrub layer than indigenous species, thereby increasing fire intensity and frequency. The exotic species regenerate much more rapidly from these fires than does the indigenous flora, and increase their population and extent of spread as a consequence. Thus ant dispersal may be an attribute for invasion, at least in fire-prone areas. A more thorough study of the ecology of invasive myrmecochore species is needed to confirm this possibility.

An interesting difference observed between introduced and local myrmecochores is that local myrmecochores tend to occur as scattered individuals with low density (Westoby et al. 1982, Milewski and Bond 1982), while invasive myrmecochores tend to occur in localised clumps with high densities. Introduced myrmecochores may even form extensive and virtually monospecific stands, as is the case in the Lofty Ranges.

Figure 7.3 graphs the occurrence of introduced species in the different vegetation formations with any of the dispersal types. As is clearly illustrated, species dispersed by birds are much more numerous than those with any other mode of dispersal. This is the case in all vegetation formations, with the exception of saltmarsh. Of the 58,137 invasive woody species counted or estimated in the 941 quadrats, 54,550 (94%), are bird dispersed. However, only about 33% of the woody ornamentals commonly planted in South-eastern Australia are bird dispersed. The majority of the bird dispersed species were either *Chrysanthemoides monilifera, Rubus* species, *Olea europaea, Crataegus monogyna, Pittosporum undulatum, Coprosma repens, Rosa rubinignosa, Asparagus asparagoides, Pyracantha* species or *Hedera helix.* Although transects were not surveyed in Sydney bushland, the evidence points in the same direction. The major weeds, *Lantana camara, Ligustrum* species, *Rubus* species, and *Chrysanthemoides monilifera* are all dispersed predominantly by birds.

Bird dispersed species are not necessarily the most numerous invasive species in other areas outside South-eastern Australia. In the fire-prone Fynbos region of South Africa, species dispersed by wind or ants are the most common invaders (Macdonald and Jarman 1984 p4-5), while Crawley

Figure 7.3 THE AVERAGE NUMBER OF INTRODUCED SPECIES, ACCORDING TO THEIR DISPERSAL AGENT EMPLOYED, IN 20M X 20M QUADRATS, SURVEYED IN BUSHLAND IN SOUTH-EASTERN AUSTRALIA



(1987) lists only one bird dispersed plant, *Symphoricarpos albus*, in his British "top twenty" alien plant species, which include three woody species dispersed by other means.

The abundance of bird dispersed plants in South-eastern Australian bushland is intriguing, given that generally the eucalypt forests and woodlands of the region are virtually devoid of local species with fleshy fruits (Milewski 1986). It is relevant that most exceptions are root or shoot parasites, such as *Exocarpos* or mistletoe, where bird dispersal is an efficient way to locate another host plant (Forde 1986). In some of the bushland areas studied, particularly in Sydney, local species dispersed by birds, which were once largely restricted to moist areas such as rainforest habitats, have expanded their range to become dominant elements in the understorey of drier *Eucalyptus* forest. Examples include *Pittosporum undulatum* (Fox 1988), *Glochidion ferdinandi* and *Breynia oblongifolia*. This suggests that the suitability of bushland, in urban South-eastern Australia, for the establishment of bird dispersed species may be a recent occurrence.

A detailed investigation of the reasons for this phenomenon is beyond the scope of this thesis, but there are several possible explanations.

Firstly, many frugivorous birds, such as the blackbird, starling, Indian mynah and European thrush have been introduced into urban bushland, some quite recently, and may have increased the efficiency of seed dispersal. There are numerous native species, however, such as the silver-eye, currawong, bower bird and various honeyeaters, which are major dispersers of exotic shrubs (Buchanan 1978, Liddy 1985, Mulvaney 1986).

Fenner(1987) and Salisbury (1942) note that particular stages of succession in European ecosystems tend to be dominated by species of particular dispersal modes. Primary succession is characterised by wind dispersed small seeded plants, mid successional stages often are characterised by a predominance of bird dispersed species, while later successional stages are marked by the predominance of species with heavy wind dispersed seeds. Obviously bushland areas are not in a state of primary succession, but on the other hand, being adjacent to urban areas, most bushland has been subject to some recent disturbance, which may account for the less than expected

number of wind dispersed immigrants. A question worth considering, however, is whether contemporary urban bushland is in a condition that resembles the secondary succession stage of Northern Hemisphere forests.

Knight (1986), found a correlation between the relative number of indigenous species of a certain dispersal type in regions of South Africa, and the bioclimatic indices of that area. He found that berry bearing species are most numerous along the moist South African East coast, and he predicted that berry bearing shrubs will be most numerous under mesic conditions. Milewski (1986) found a correlation between the occurrence of fleshy fruited plants and the amount of nutrients in the soil, particularly potassium. Given that much of the urban bushland surveyed for this thesis, has recently received increased water and nutrient input as runoff from urban catchments, or from leaking septic systems, it is possible that changes in mesic and nutrient factors have aided the dominance of non-local species dispersed by birds (Clements 1983). Contrary to this argument, however, is the observation that bird dispersed invasive species are able to establish in areas at the top of a catchment, above any direct urban influence.

A final explanation for the success of species dispersed by birds, is that they have been favoured by the suppression of fire in urban bushland areas (Fox 1988, Milewski 1986), though many of the most invasive bird dispersed species will readily sprout after fire.

The general conclusion on the relationship between agent of dispersal and invasiveness is that an introduced ant dispersed species is more likely to have become invasive than a species employing any other mode of dispersal, but once established, bird dispersed species will become the most numerous.

7.7 Generation Length.

Plant longevity occurs in two ways, either through long life of the whole plant, or through seeds/propagules retaining their viability for long periods. A feature of seed/propagule longevity is that it will have a cumulative effect of increasing plant fecundity. As an example, let us assume that *Ulmus parviflora*, and *Robinia pseudoacacia*, both produce 100,000 seeds a year. Because *Ulmus* seeds are only viable for a matter of weeks, while those of *Robinia* will remain viable for over 50 years, after ten years the

theoretical number of viable *Ulmus* seeds will be 100,000, while that of *Robinia* will be 1,000,000.

In Table 7.16, seed longevity is tested against intrusiveness. The major references consulted for seed longevity data are Ewart (1908), Crocker (1938) and Barton (1961). Table 7.16 demonstrates that species with long seed viability are more likely to become both invasive or intrusive in South-eastern Australia.

Table 7.16. Seed Longevity V's Intrusiveness

	Invasive	Non-invasive	Immigrant	Non-Immigrant
Seed longevity	species	species	species	species
< 3 years	**11**(10)	**64**(65)	**6**(16)	**69**(59)
3-15 years	**18**(27)	**174**(165)	**37**(40)	**155**(152)
≥15 years	**24**(16)	**91**(99)	**36**(24)	**79**(91)
Chi-square	**8.3129**		**15.810**	
Degrees of freedom	2		2	
Probability	P < 0.05		P < 0.001	

Information on whole plant longevity is very sketchy and biased towards those long lived species whose age can be determined by tree-ring counting. It was possible, however, to obtain life-span data, outside Australia, on 134 of the woody ornamentals commonly planted in South-eastern Australia, chiefly from the following sources Harper and White (1974), Molisch (1929), Sudworth (1967), and Hightshoe (1978). Life spans for species recorded were usually not of average life spans, but of maximum or near maximum age.

In Figure 7.4 it is obvious that species with short life spans are more likely to be invasive than those with long lives. This is not the case, however, when immigrant species are considered (Figure 7.5), with short lived species being the least likely to be immigrants. Perhaps short-lived plants are rarely immigrants, because they simply do not persist for long periods in bushland, but either will perish or thrive, reproduce and spread.

It is concluded that species with a long lasting seed viability but a relatively short life span are more likely to be invasive, than species with a long lifespan and seed that is viable for only a short time.

Figure 7.4 INVASIVENESS V'S LIFE SPAN

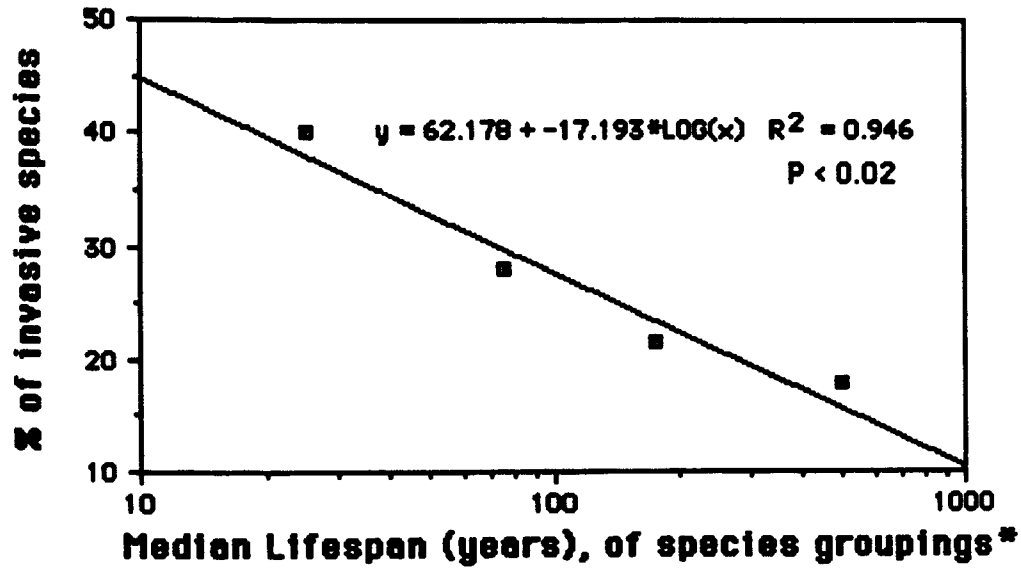
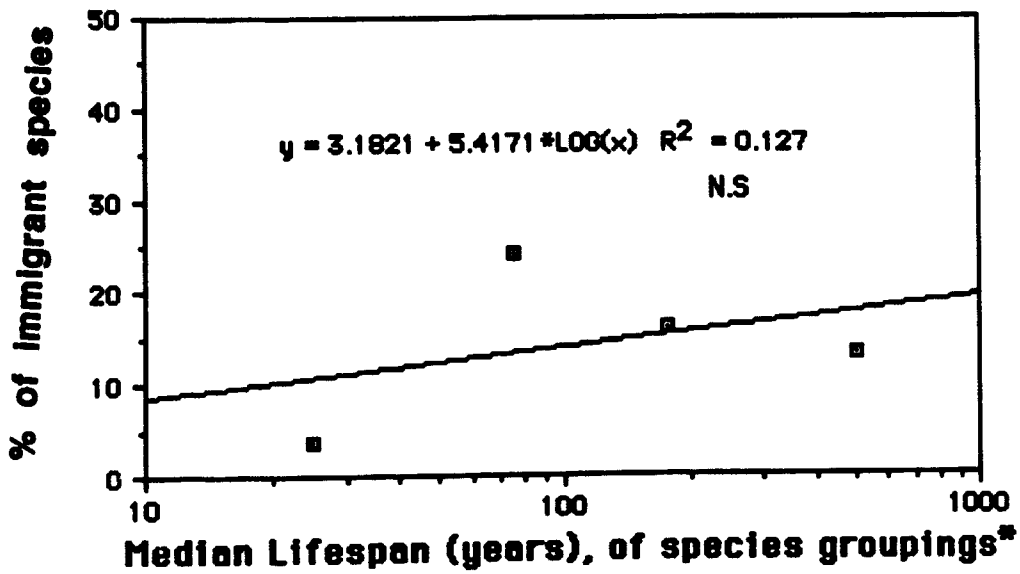


Figure 7.5 IMMIGRANT STATUS V'S LIFE SPAN



*Data on life span was obtained for 134 of the species commonly planted in South-eastern Australia. These species were then placed into four fairly equal groupings, according to their recorded life span.

7.8 Hybridization

Although South-eastern Australian nurseries have sold many hybrid plants (see appendices 1-5), these tend not to be among the most common plantings. It is acknowledged, however, that by omitting most rose, rhododendron, azalea, geranium and fuchsia species, from study in this thesis, many popularly planted hybrids escaped record. These plants were omitted because of the difficulty in sorting out their synonymy (see Chapter 2.2 for a discussion on this point). It also should be noted that many hybrids of horticulture may not be hybrids in the biological sense, of being derived from two or more species.

Another problem with using the catalogue record as a guide to hybridization, is that species horticulturally considered as hybrids, may not be so in a genetic sense. Nevertheless, of the six hybrid species recorded amongst popular plantings (*Grevillea X Canberra gem, Bougainvillea X buttiana, Malus X domestica, Musa X paradisiaca, Platanus X acerifolia* and *Ulmus X hollandica*), five are immigrants. A further six hybrids, not among the most popular recorded plantings (*Erythrina X Skyesii, Crataegus X prunifolia, Pelargonium X domestica, Pelargonium X hortorum, Rubus X ulmifolius,* and *Salix X rubens)*, are also intrusive in South-eastern Australia. In addition, there are a few cases where non-hybrid commonly planted species have crossed with each other, or with a local species, to form an intrusive hybrid. Examples include *Acacia baileyana X Acacia decurrens, Pittosporum undulatum X Pittosporum bicolor,* and *Grevillea rosmarinifolia X Grevillea juniperina X Grevillea X Canberra gem.* As outlined in chapter two, the difficulty in distinguishing an immigrant hybrid when it is likely to be growing amongst morophologically similar parents in a bushland context, means that it is likely that some invasive hybrids in South-eastern Australia will have gone unrecorded.

There are insufficient data on the intrusive occurrence of hybrids as opposed to non-hybrids to draw anything but uncertain conclusions. However, amongst those hybrids for which there is data, most have become intrusive.

7.9 Fecundity

Little data exists on the seed fecundity of woody plants, and available information is largely on "problem" plants, making comparisons between intrusive and nonintrusive plants difficult. Fecundity data were obtained for twenty one of the commonly planted species (Jones 1959, Gimingham 1960, Wardle 1960, Peterken and Lloyd 1967, Amor and Richardson 1980, Weiss 1960 and Harper and White 1974).

Table 7.17 arranges the twenty one species according to their fecundity. A Wilcoxon two sample test was performed on the rankings. This test determined that the mean of the rankings of invasive and non-invasive species are not significantly different. There is no significant difference, also, when intrusive/non intrusive rankings are compared.

When only shrubs are considered, however, invasive species are, significantly, the more fecund species. It is also of interest that where data are available on more than one species from a genus (i.e *Hakea* and *Acacia*) it is the more fecund members of a genus that are invasive.

7.10 Total genetic variability

As little information is available on such aspects as chiasma frequency or chromosome size, it is not possible to gain a complete picture of the genetic variability of a plant by simply combining the different components that influence it. Nevertheless, an idea of the degree of a plant's genetic variability, and whether intrusive plants adopt similar compromises between genetic variability and conservation, may be gained by combining those factors for which information is available. These factors are listed below.

Table 7.17: FECUNDITY V'S INTRUSIVENESS

SPECIES	FECUNDITY *	RANK	WEED STATUS	LIFEFORM
Populus tremula	54,000,000	1		T
Pyracantha fortuneana	1,000,000	2.5	I	S
Pyracantha angustifolia	1,000,000	2.5	I	S
Rubus fulmifolius	200,000	4	I	S
Calluna vulgaris	158,000	5		S
Ulmus parvifolia	155,000	6	I	T
Ilex aquifolium	120,000	7	M	S
Cinnamomum camphora	113,000	8	I	T
Fraxinus excelsior	100,000	9.5	I	T
Hypericum calycinum	100,000	9.5		S
Quercus rober	50,000	11	I	T
Pinus ponderosa	15,000	12	M	T
Pittosporum undulatum	10,000	14	I	S
Acacia saligna	10,000	14	I	S
Lantana camara	10,000	14	I	S
Acacia cyclops	5,000	16	M	S
Acacia longifolia	3,500	17		S
Hakea sericea	2,000	18	M	S
Cytisus scoparius	316	19	I	S
Hakea suaveolens	100	20		S
Acacia suaveolens	50	21		S

I = INVASIVE M = MIGRANT S = SHRUB T = TREE

WILCOXON TWO SAMPLE TESTS

ALL INVASIVE V'S NON-INVASIVE SPECIES: U1 = 70.5 U2= 31.5 N.S.

ALL INTRUSIVE V'S NON-INTRUSIVE SPECIES: U1 = 52.5 U2 = 32.5 N.S.

INVASIVE SHRUBS V'S NON-INVASIVE SHRUBS: U1 = 39 U2 = 10 $P < 0.05$

* (ANNUAL SEED OUTPUT)

In order to combine one factor with another, the categories of a factor were divided according to whether their possession by a plant would add little, moderate, or heighten genetic diversity, such that;

Mode of reproduction	L = asexual reproduction M = Sexual and asexual reproduction H = Sexual reproduction only
Seed Dispersal	L = ballistic, ant, and/or cache dispersed M = Wind(heavy seed), bird and/or mammal H = Water and/or wind(light seed)dispersed
Pollen Dispersal	Low Moderate (as defined in 7.3) High
Chromosome number	L = < 29 M = 29 - 59 H = >59
Seed Longevity	L = < 3 years M = 3 - 15 years H = > 15 years
Mode of Fertilisation	L = predominantly self-fertilised M = Self and cross fertilised H = Cross fertilisation
Fecundity	L = < 999 seeds produced annually M = 1000 - 9999 seeds produced annually H = > 10000 seeds produced annually
Generation Length	L = > 250 years M = 100 - 250 years H = < 100 years

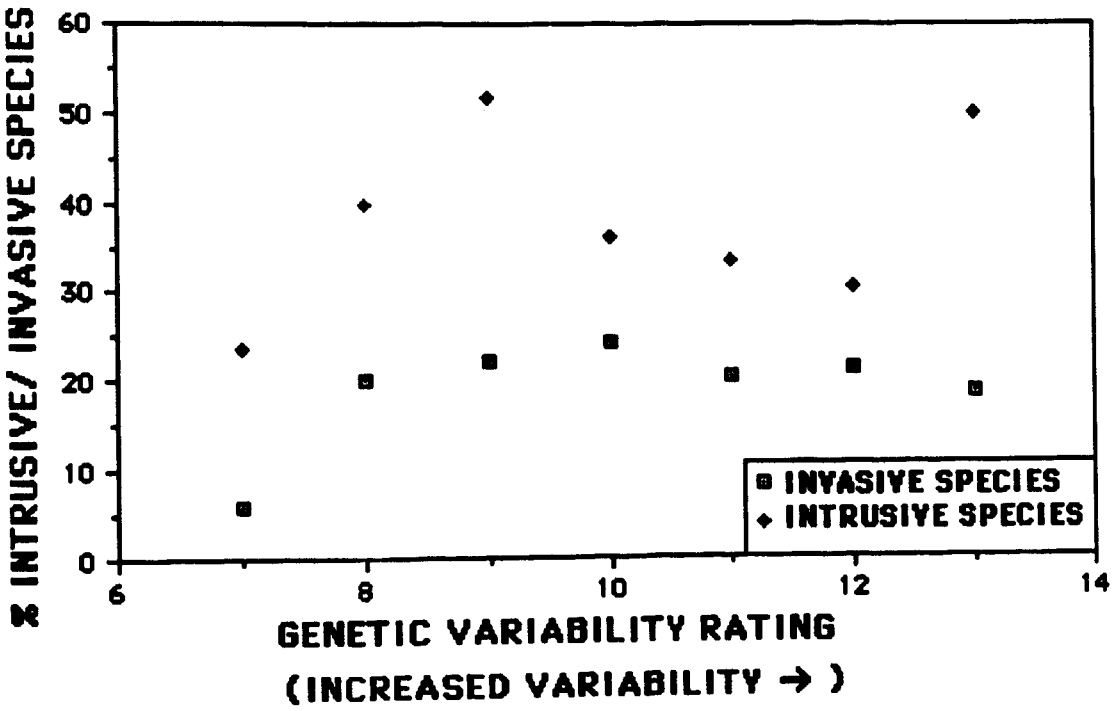
A variability score for a plant was obtained by assigning it a score of 1 for each feature of little genetic variability it possessed, a score of 2 for each moderately variable feature, and a score of 3 for each feature creating high genetic variability. For no species was information available on all eight characters, but for 287 of the species studied information was obtained for five or more of the factors. The total scores of species for which information was available on six factors were multiplied by 5/6, while those with seven factors were multiplied by 5/7. Thus, if a species possessed only factors of little genetic variability it received a rating score of 5, while a species possessing only factors of high genetic variability scored 15.

In actual practice none of the 287 species adopted a strategy of "all-out" genetic variability or conservation and the scores ranged from 7 to 13. Of the species for which information was available *Calluna vulgaris, Opuntia robusta, Corylus avellana* and *Citrus* species were amongst the least variable, while *Arundo donax, Platanus X acerifolia, Sequoia sempervirens,* and *Hibiscus* species were amongst the most variable.

In figure 7.6, the variability score is plotted against the percentage of invasive or intrusive species at a particular score. The variability score provides little indication of a plant's spreading ability in South-eastern Australian bushland. The rating score of least variability (7) did contain a noticeably smaller percentage of invasive or intrusive species than all other ratings, but as the number of species falling into this category is only seventeen the difference is not statistically significant.

Thus genetic variability, as measured by the possession of features influencing it, is not a good gauge of the invasive ability of woody species, planted in South-eastern Australia. However, because electrophoretically determined measures of genetic variation have been obtained for so few of the commonly planted species in South-eastern Australia, the adequacy of the data in determining genetic variability could not be gauged. Therefore this thesis cannot disregard high or low genetic variability as a feature of invasive woody plants in South-eastern Australia.

Figure 7.6. GENETIC VARIABILITY V'S SPREADING ABILITY



7.11 Phenotypic attributes

If an ornamental plant is to become invasive it must be able to disperse from a planting to sites suitable for its establishment, growth reproduction, and subsequent dispersal. The following discussion examines those phenotypic attributes that place constraints on suitable sites for establishment and survival, growth and reproduction. The relationship between invasiveness and dispersal attributes and some other attributes relevant to the genetic system, have been examined previously. These attributes may enable a plant to be invasive, irrespective of their effect on the genetic system.

Attributes affecting establishment, growth and reproduction, can be examined separately or in groups. Groups which have proven useful in identifying invasive plants include taxonomy, lifeform and suites of eco-physiological characters.

7.12 Taxonomic attributes

Plant taxonomy groups species together largely on similarities in flower and fruit form. These similarities are thought to reflect related evolutionary histories. There have been numerous studies, throughout the world, outlining the degree with which various taxonomic families contribute to weed floras. The common conclusion is that Asteraceae, leguminosae and Poaceae contribute most. Other weedy families, which contain woody species, have been identified as Euphorbiaceae, Solanaceae, and Rosaceae (Guillerm and Maillet 1982, Raven and Axelrod 1978, Gullan 1988, Wells et al. 1986, Heywood 1989).

In general terms, these studies have found that the largest angiosperm families supply the greatest percentages of the world's weed floras. Heywood (1989), proposes that *"the very features that have been responsible for the evolutionary success and diversity of these families are those that have been responsible for their successful spread and establishment as aliens."* A simpler explanation for the general trend is that the percentages in the weed floras only reflect the percentages that each family contributes to the total world flora. The results shown in table 7.19 do, however, provide support for Heywood's proposition.

Most of the studies that have examined correlations between family membership and weed frequency, have involved all plant lifeforms which have become weeds in all environments. Wells et al. (1986) found that, although the principal weed species in South Africa belong to the Poaceae, leguminosae, Asteraceae and Solanaceae, those species that transform the character, condition, form, or nature of a natural ecosystem, belong to the leguminosae, Myrtaceae, or Pinaceae. The use of "transform" by Wells et al. (1986) appears analogous to the use of pest in this thesis.

Table 7.18 lists the number of invasive, immigrant, and non-intrusive species, for each of the 112 families from which woody ornamentals were commonly planted in South-eastern Australia.

In table 7.19 those families containing at least thirteen species that have been commonly planted (i.e, > 1.5% of all species) have been tested for dependence with invasiveness and intrusiveness.

Those families that have a higher than expected proportion of invasive species are in decreasing order:
Fabaceae > Rosaceae > Mimosaceae > Salicaceae > Oleaceae

Those with less than expected invasive species are:
Myrtaceae > Cupressaceae

Intrusive families are: **Mimosaceae > Rosaceae > Fabaceae.**

Finally, non-intrusive families are:
Myrtaceae > Saxifragaceae > Palmae > Rutaceae = Ericaceae

Given that few woody Poaceae or Asteraceae have been commonly planted in South-eastern Australia, the results are fairly consistent with those which focused upon introduction success, irrespective of habitat, of invasion, or introduction pressures. As with most other studies, Legume families and the Rosaceae were found to be most likely to contain invasive species. There are no similar studies with which to compare the results for non-invasive species, although Wells et al. (1986) state that many of the species that can transform natural ecosystems in South Africa (i.e, become abundant invaders), belong to the Myrtaceae. In contrast, in South-eastern

Table 7.18 . Family Membership and Intrusiveness in South-eastern Australia

	I	M	U	T
Acanthaceae	1	0	7	8
Aceraceae	2	1	6	9
Actinidaceae	0	0	1	1
Agavaceae	1	3	5	9
Anacardiaceae	2	1	1	4
Annonaceae	0	0	1	1
Apocynaceae	1	2	4	7
Aquifoliaceae	1	0	0	1
Araceae	0	1	0	1
Araliaceae	1	0	4	5
Araucariaceae	0	0	5	5
Aristolochiaceae	0	0	1	1
Asclepiadaceae	3	0	3	6
Asteraceae	2	4	6	12
Basellaceae	0	0	1	1
Baueraceae	0	0	0	1
Berberidaceae	0	3	7	10
Betulaceae	1	0	4	5
Bignoniaceae	2	1	9	12
Buxaceae	0	0	2	2
Cactaceae	1	2	1	4
Caesalpiniaceae	2	0	6	8
Calycanthaceae	0	0	2	2
Caprifoliaceae	1	4	21	26
Caricaceae	0	0	1	1
Casuarinaceae	0	1	1	2
Celastraceae	0	0	3	3
Cistaceae	0	0	2	2
Clethraceae	0	0	1	1
Combretaceae	0	0	1	1
Convolvulaceae	1	1	1	3
Cornaceae	0	0	5	5
Corynocarpaceae	0	0	1	1
Crassulaceae	3	3	1	7
Cupressaceae	0	4	22	26
Cyadaceae	0	0	1	1
Cyperaceae	0	1	0	1
Ebenaceae	0	0	1	1
Elaeagnaceae	0	0	1	1
Epacridaceae	0	0	2	2
Ericaceae	2	1	19	22
Euphorbiaceae	1	0	4	5
Fabaceae	9	10	16	35
Fagaceae	2	2	13	17
Garryaceae	0	0	1	1
Geraniaceae	0	2	0	2
Ginkgoaceae	0	0	1	1
Goodeniaceae	0	1	0	1
Gramineae	3	1	3	7
Hamamelidaceae	0	0	4	4
Hippocastanaceae	0	1	0	1
Hydrophyllaceae	0	1	0	1
Hypericaceae	1	0	3	4
Illiciaceae	0	0	1	1
Juglandaceae	0	0	5	5
Lamiaceae	1	2	9	12
Lardizabalaceae	0	0	1	1
Lauraceae	1	0	1	2
Liliaceae	5	3	1	9
Loganiaceae	1	1	5	7
Lythraceae	0	0	3	3
Magnoliaceae	0	0	6	6
Malpighiaceae	0	0	1	1
Malvaceae	0	2	6	8
Meliaceae	0	0	1	1
Mimosaceae	7	12	9	28
Moraceae	1	4	3	8
Musaceae	0	1	1	2
Myoporaceae	1	0	1	2
Myrtaceae	2	18	79	99
Nyctaginaceae	0	1	2	3
Ochnaceae	1	0	0	1
Oleaceae	6	4	16	26
Onagraceae	1	0	0	1
Paeoniaceae	0	0	1	1
Palmae	0	0	11	11
Pandanaceae	0	0	4	4
Passifloraceae	1	3	3	7
Pinaceae	4	1	17	22
Pittosporaceae	2	0	4	6
Platanaceae	0	1	1	2
Plumbaginaceae	0	0	2	2
Podocarpaceae	0	0	1	1
Polemoniaceae	0	0	2	2
Polygalaceae	2	0	1	3
Polygonaceae	0	1	1	2
Proteaceae	1	13	23	37
Punicaceae	0	0	1	1
Ranunculaceae	0	0	1	1
Rhamnaceae	1	0	2	3
Rosaceae	15	24	36	75
Rubiaceae	1	0	10	11
Rutaceae	0	3	19	22
Salicaceae	5	2	6	13
Sapindaceae	0	1	1	2
Saxifragaceae	0	0	14	14
Scrophulariaceae	0	1	7	8
Simaroubaceae	1	0	0	1
Solanaceae	1	7	12	20
Sterculiaceae	0	1	1	2
Strelitziaceae	0	1	1	2
Tamaricaceae	0	2	1	3
Taxaceae	0	0	1	1
Taxodiaceae	0	0	4	4
Theaceae	0	0	4	4
Thymelaeaceae	0	0	4	4
Tiliaceae	0	0	2	2
Tremandraceae	0	1	1	2
Ulmaceae	3	2	4	9
Verbenaceae	1	0	5	6
Vitaceae	0	2	4	6
Zingiberaceae	1	0	0	1

I = No. of Invasive Species

M = No. of Immigrant Species

U = No. of Unintrusive Species

T = Total Number of Species

Table 7.19: TAXONOMIC FAMILY V'S INTRUSIVENESS

FAMILY	INTRUSIVE SPECIES	NON-INTRUSIVE SPECIES	χ^2	INVASIVE SPECIES	NON-INVASIVE SPECIES	χ^2
Asteraceae	6 (4)	6 (8)	1.5	2 (1)	10 (11)	1.09
Berberidaceae	3 (3)	7 (7)	0	0 (1)	10 (9)	1.11
Bignoniaceae	3 (4)	9 (8)	0.38	2 (1)	10 (11)	1.09
Caprifoliaceae	5 (8)	21 (18)	1.63	1 (3)	25 (23)	1.51
Cupressaceae	4 (8)	22 (18)	2.89	0 (3)	26 (23)	3.39
Ericaceae	3 (7)	19 (15)	3.35	2 (2)	20 (20)	0
Fabaceae	19 (11)	16 (24)	8.48	9 (4)	26 (31)	7.06
Fagaceae	4 (5)	13 (12)	0.28	2 (2)	15 (15)	0
Lamiaceae	3 (4)	9 (8)	0.38	1 (1)	11 (11)	0
Mimosaceae	19 (9)	9 (19)	16.37	7 (3)	21 (25)	5.97
Myrtaceae	20 (31)	79 (68)	5.68	2 (1)	97 (88)	8.28
Oleaceae	10 (10)	16 (18)	0.72	6 (3)	20 (23)	3.39
Palmae	0 (3)	11 (8)	4.13	0 (1)	11 (10)	1.10
Pinaceae	5 (7)	17 (15)	0.84	4 (2)	18 (20)	2.20
Proteaceae	14 (12)	23 (25)	0.49	1 (4)	36 (33)	2.52
Rosaceae	39 (24)	36 (51)	13.78	15 (8)	60 (67)	6.86
Rubiaceae	1 (3)	10 (8)	1.83	1 (1)	10 (10)	0
Rutaceae	3 (7)	19 (15)	3.35	0 (2)	22 (20)	2.2
Salicaceae	7 (6)	13 (14)	0.24	5 (2)	15 (18)	5.00
Saxifragaceae	0 (4)	14 (10)	5.60	0 (2)	14 (12)	2.33
Solanaceae	8 (6)	12 (14)	0.95	1 (2)	19 (18)	0.55
	Chi-square total 72.86			Chi-square total 55.15		
	Degrees of freedom = 20			Degrees of freedom = 20		
	P < 0.001			P < 0.001		

6 = observed number (4) = expected number

Australia, the Myrtaceae family was found to provide the least number of invasive species, in relation to its introduction pressure. When the data of Wells et al. (1986) is examined, however, only six of the forty-seven species, recognized as "transformers", belong to the Myrtaceae. Given that over 170 species of *Eucalyptus* have been introduced to South Africa (Kruger et al. 1986), it seems probable that although 12% of all transformers belong to the family Myrtaceae, a comparable percentage of species introduced into South Africa were from the Myrtaceae.

A conclusion that may be gleaned from table 7.18, is that most intrusive species are angiosperms. Although this is largely because many more angiosperms have been commonly planted than gymnosperms, table 7.20 indicates that significantly fewer than expected gymnosperms are intrusive. Gullan (1988), found that this was also the case for all weeds in all habitats in the State of Victoria.

Table 7.20. Intrusiveness and Taxonomic Order.

	Invasive species	non-invasive species	intrusive species	non-intrusive species
Gymnosperm	4 (8)	61 (57)	9 (21)	56 (44)
Monocot	10 (6)	37 (41)	21 (15)	26 (32)
Dicot	94 (93)	623 (624)	243 (236)	474 (481)
Chi-squares	5.35		13.96	
Degrees of freedom	2		2	
Probability	N.S.		P < 0.001.	

There is no significant difference between the invasiveness or intrusiveness of monocots or dicots.

7.13 Invasiveness and Evolutionary History

Hodgson (1986) found that rare species in Central England tend to belong to evolutionary primitive families, while common species of widespread occurrence tend to be from more advanced families. In the same region, Grime (1986) found that those species that had the greatest capacity to colonize spoil heaps also belonged to evolutionary advanced families. Both studies predominantly concentrated on herbaceous species, which itself is thought to be a more evolutionary advanced lifeform. Nevertheless the

studies raise speculation that invasiveness may be linked to family evolution.

The index of evolutionary advancement used by both authors was that of Sporne (1980). Sporne's index was devised from scoring the presence or absence of thirty characters thought to be primitive or advanced. Primitive or advanced characters were determined either in conjunction with the fossil record, or by correlation with other characters identified in fossil features (Sporne 1956). Sporne (1982) later found that his ratings of evolutionary advancement correlated well with the first appearance of a family's pollen in the fossil record.

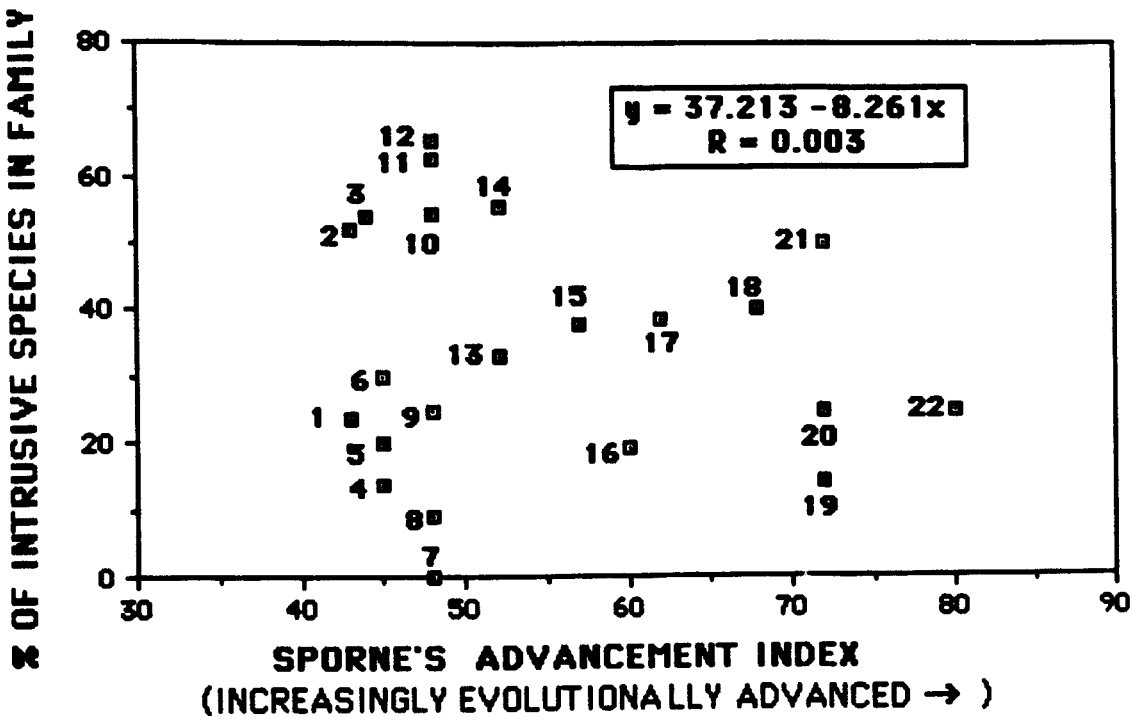
In Figure 7.7, families have been plotted against Sporne's index, according to the proportion of intrusive species they contain. No correlation was found between these two variables. The correlation between evolutionary advancement (as defined by Sporne's index) and invasiveness yields a similar graph, and a line of best fit, of $Y = 18.634 - 0.1074x$ $R^2 = 0.011$, is clearly not significant.

In addition to Sporne's index, most taxonomic classifications seek to mirror evolutionary history. Whereas there is widespread agreement about the division of genera into families, there is disagreement about the correct evolutionary arrangement of these families.

Three such arrangements will now be examined to test further the relationship between invasiveness and evolutionary history. These are the classifications of Dahlgren (1980) and the similar classifications of Cronquist (1981) and Takhtajan (1980). The orders and subclasses employed by these authors can be obtained from the literature.

The distribution of invasiveness amongst these orders and subclasses does not correlate with supposed evolutionary advancement. The most invasive orders of Dahlgren's classification are Rosiflorae and Fabiflorae, while it is the Rosales and Fabales in the Cronquist and Takhtajan systems, these orders all being classed as of moderate evolutionary advancement. Both Cronquist and Takhtajan rate the invasive Urticales order as primitive, while Dahlgren has the univasive Corniflorae as amongst the most advanced of families.

Figure 7.7. EVOLUTIONARY ADVANCEMENT V'S INTRUSIVENESS



1. Fagaceae
2. Rosaceae
3. Salicaceae
4. Ericaceae
4 Rutaceae
5. Myrtaceae
6. Berberidaceae
7. Saxifragaceae
8. Rubiaceae
9. Malvaceae
9 Caesalpiniaceae
10. Fabaceae
11. Moraceae
12 Mimosaceae
13 Aceraceae
14 Ulmaceae
15. Proteaceae
16. Caprifoliaceae
17 Oleaceae
18. Solanaceae
19. Scrophulariaceae
20. Lamiaceae
21. Asteraceae
22. Bignoniaceae

Little additional information on invasiveness was obtained from comparing the percentage of invasive species in each of the orders or subclasses of the taxonomic classifications examined. The exceptions are the Magnoliidae of Cronquist and Takhtajan containing only one invasive species amongst a total of twenty-five species, and the Corniflorae of Dahlgren containing only four invasive species amongst a total of seventy-four species. It should be noted that the Magnoliidae is the most primitive subclass or order of all three classifications.

Families belonging to the Magnoliidae that are present amongst the woody ornamental species introduced to South-eastern Australia, are the Annonaceae, Magnoliaceae, Illiciaceae, Calycanthaceae and Lauraceae. Families belonging to the Corniflorae include the Actinidiaceae, Clethraceae, Epacridaceae, Garryaceae, Ericaceae, Cornaceae, Aquifoliaceae, and Saxifragaceae.

7.14 Nitrogen Fixation.

One reason that the leguminosae are thought to be successful invaders is their ability to fix atmospheric nitrogen, allowing them to maintain a high growth rate on nutrient poor sites (Whiting et al. 1986). Not all leguminosae are nitrogen fixing, however, and this is particularly true in the Caesalpiniaceae. Unfortunately, for this thesis, only nine non-nodulating legumes have been commonly planted. O these two, *Cassia bicapsularis*, and *Gleditsia triacanthos*, are invasive, while *Cassia floribunda* is an immigrant. (Allen and Allen 1981).

Five non-legume nitrogen fixing species have been commonly planted in South-eastern Australia, these are *Alnus glutinosa, Casuarina glauca, Casuarina torulosa, Arctostaphylos uva-ursi,* and *Elaeagnus pungens* (Bond 1976). Of the five species, *Alnus glutinosa* is invasive on the shores of Canberra's Lake Burley Griffin , while *Casuarina glauca* is an immigrant in the Adelaide Hills.

Seventy eight of the commonly planted legumes have been recorded as nodulating (Allen and Allen 1981). Twelve of these are invasive while seventeen are immigrants. Because of the low number both of non-legume nitrogen fixers and non-nitrogen fixing legumes, it cannot be determined

whether or not an ability to fix nitrogen is an important attribute of woody species invading South-eastern Australia's bushland.

7.15 Ectomycorrhizae

As well as increasing nutrient supply through an association with bacteria, many plants can increase the availability of nutrients through association with fungi. Those plants with ectomycorrhizae are thought to be particularly favoured, because mycorrhizae can break down leaf litter and nutrients pass directly to the plant roots (Malloch et al. 1980). Ectomycorrhizal associations are particularly common amongst the Salicaceae, Pinaceae, Cupressaceae, Juglandaceae, Betulaceae, Fagaceae, Ulmaceae, Rosaceae, leguminosae, Aceraceae, Malvaceae, Myrtaceae and Ericaceae (Meyer 1973).

There seems to be no advantage or disadvantage of ectomycorrhizae association, however, to a plant's ability to become either invasive or intrusive (see table 7.21).

Table 7.21. Ectomycorrhizae association V's spreading ability

	Invasive species	Non-invasive species	Intrusive species	Non-intrusive species
+ Assoc.	18(23)	193(188)	57(64)	154(147)
No Assoc.	59(54)	423(428)	153(146)	329(336)
Chi- squares		1.743		1.481
Significance		N.S.		N.S.

7.16 Photosynthetic Pathway.

Photosynthesis in terrestrial plants can occur via three major biochemical pathways, namely the C3, C4 and Crassulacean Acid Metabolism (CAM) pathways. C4 plants, which are mostly herbaceous, have been noted to dominate the world's weed floras, particularly in tropical crop situations (Elmore and Paul 1983). C3 plants tend to be the dominant weeds in temperate areas such as Victoria, Australia (Newsome and Noble 1986), and South Africa (Whiting et al. 1986). However, differences in the way carbon is incorporated into plants tell little about the invasive potential of woody ornamental plants introduced into South-eastern Australia, as only one species, *Miscanthus sinense*, has been recorded as having a C4 pathway.

This species is an immigrant in Sydney bushland. The *Opuntia* species, which are most invasive in Melbourne and Adelaide bushland, are the only commonly planted species with the CAM pathway.

7.17 Seed Weight

Seeds contain the initial nourishment for newly established seedlings. The greater the amount of nourishment in the seed, the more independent is the seedling of physical site constraints, and the longer it has to establish a root and shoot system. Against these advantages heavy seed will usually only disperse across small distances, it may be more attractive to seed predators and will be physiologically costly to produce.

In figure 7.8, species have been ranked into six groupings, according to seed weight. The major reference on seed weight was Schopmeyer (1974). Those species with seed weights of 10mg - 150mg (a middle range) have the greatest probability of being both immigrant or invasive species. Salisbury (1942) observed that species within this range of seed weights usually were from intermediate successional habitats.

7.18 Time to first flowering.

Species that reach reproductive age quickly generally have a greater ability to maintain a population under a recurrent and frequent catastrophic disturbance, such as fire. Species with short juvenile stages are also likely to build up their numbers quickly after their dispersal into a favourable habitat.

Figure 7.9 plots a significant correlation between spreading ability and time taken to produce first flowers. Of the 116 species for which flowering information was available (Schopmeyer 1974, Hightshoe 1978), twenty-four species flower within two years. Of these twenty-four species, thirteen are invasive, while twenty-one are intrusive.

7.19 Growth Rate.

In competitive interactions, a plant with rapid growth would be expected to have initial access to, and perhaps monopoly over, light and nutrient resources, thereby promoting itself over a plant of slow growth. Plant growth rate has been expressed either in absolute or in relative terms. Comparable growth rate values for the commonly planted woody

Figure 7.8 . SEED WEIGHT V'S SPREADING ABILITY

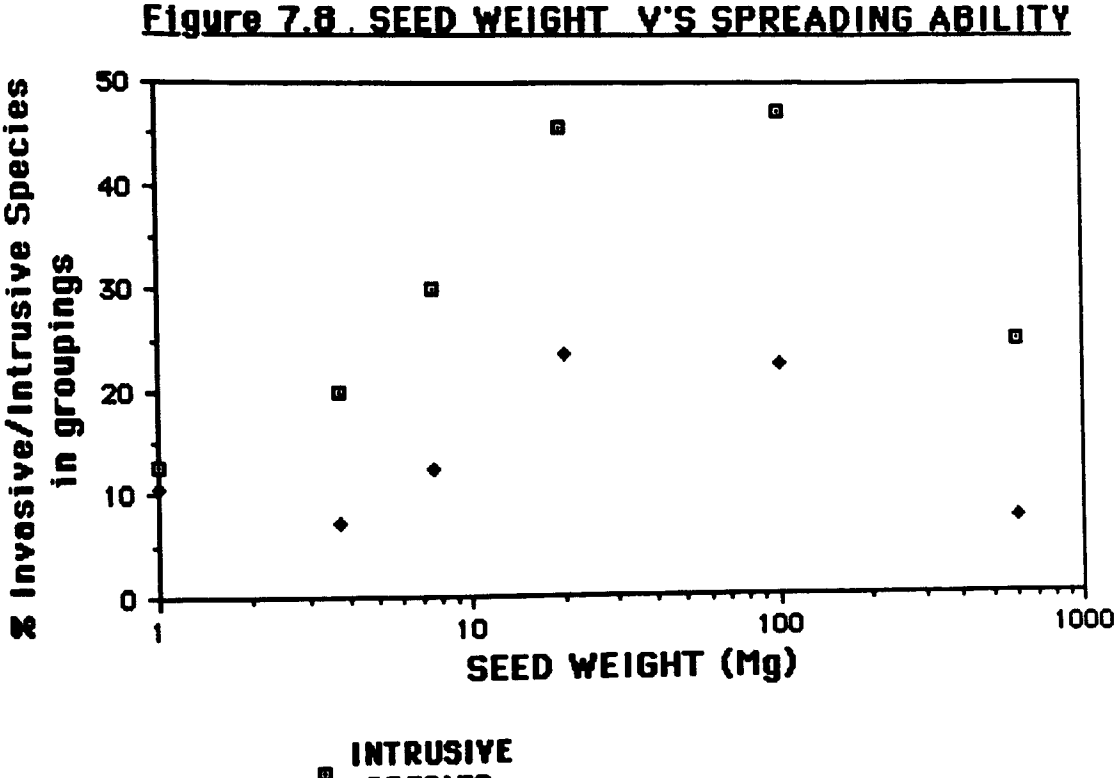
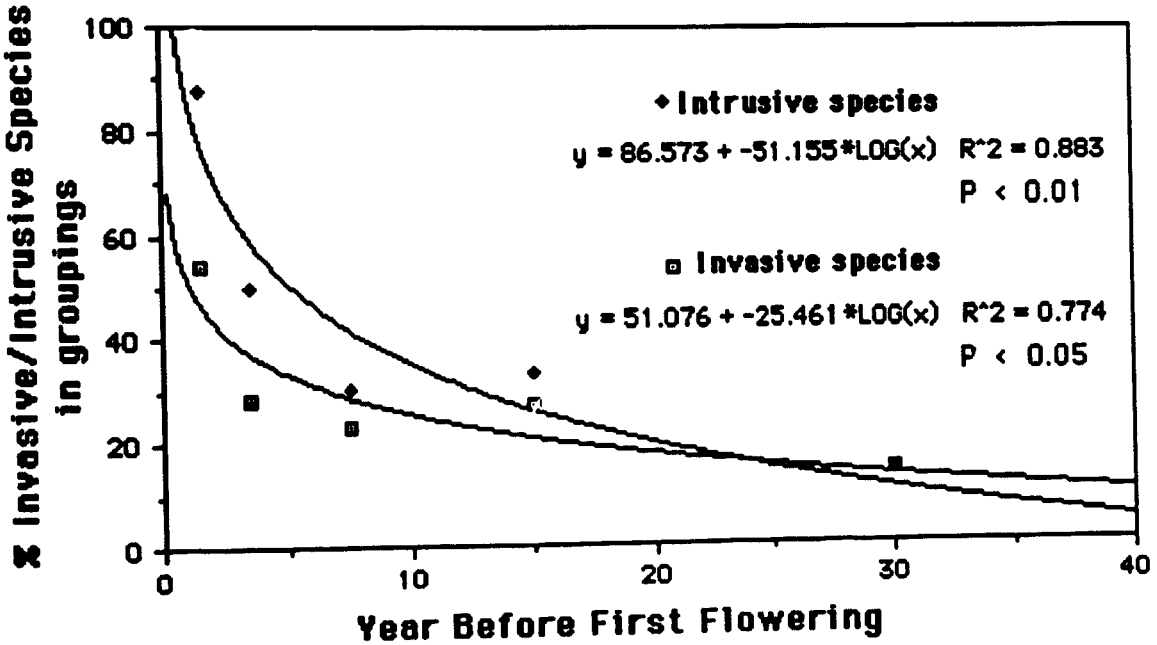


Figure 7.9 . Time Taken to produce 1st flowers V's Spreading Ability



ornamentals of South-eastern Australia are difficult to obtain, without conducting the measurements oneself. Hightshoe (1978) lists the early life, and the absolute shoot growth rate of forty-two of the commonly planted tree species. Amongst these species, spreading species are not associated with a slow (<30cm), medium (30-60cm), or fast (>60cm), growth rate. Slow growers included intrusive and invasive species of *Crataegus*, while fast growers included invasive species such as *Acer negundo, Quercus palustris,* and *Robinia pseudoacacia.*

7.20 Lifeform

There are several classifications that have grouped plants according to their similarities in structure and function. Raunkiaer's lifeform system and its extension by Braun-Blanquet has found widest application (see Mueller-Dombois and Ellenberg 1974). The Raunkiaer system is largely based on the position of the buds or organs during an unfavourable season. It originally identified five basic lifeforms, to which another four classes were later added. Of these nine classes only three relate to woody species: Phanerophytes (buds at least 25cm above the ground surface); Chamaephytes (buds above the ground but below 25cm); and lianes (woody climbers or vines).

Table 7.21 groups species according to their Raunkiaer classification and tests the groups against intrusiveness and invasiveness. There is no significant relationship with invasiveness, although lianes have proved to be significantly more intrusive, than expected, and chamaephytes less so.

Mueller-Dombois and Ellenberg (1974) expanded the Raunkiaer system into twenty-three major lifeforms. Box (1981(a)) expanded this classification still further into ninety classes. Box's classification is largely based on the following characters: structural type; size; leaf form and size; and seasonal habit. A more detailed discussion of Box's classification is given in Chapter 6.4 and in Table 6.5.

Tables 7.23 and 7.24 group the commonly introduced woody ornamentals of South-eastern Australia into Box's lifeform classifications and matches these against intrusiveness and invasiveness. There are highly significant associations in both cases. Lifeforms significantly invasive in South-eastern

Table 7.22 RAUNKIER'S LIFEFORM CLASSIFICATION V'S INTRUSIVENESS

Lifeform	invasive species	non-invasive species	immigrant species	non-immigrant species
Phanerophyte	88 (87)	649 (650)	228 (228)	509 (509)
Chamaephyte	0 (3)	26 (23)	3 (8)	23 (18)
Liane	11 (9)	61 (63)	27 (22)	45 (50)
degrees of freedom	2		2	
Chi - squared	3.9		6.18	
significance	Not significant		P < 0.05	

TABLE 7.23 LIFEFORM V'S INVASIVENESS

LIFEFORM	INVASIVE SPECIES	NON-INVASIVE SPECIES	X^2
TROPICAL EVERGREEN SCLEROPHYLL TREE	0 (5)	41 (36)	5.69
MEDITERRANEAN BROAD EVERGREEN TREE	3 (1)	9 (11)	2.18
SUMMERGREEN BROAD LEAVED TREE	14 (9)	60 (65)	3.16
TEMPERATE RAINFOREST NEEDLE TREE	0 (1)	10 (9)	1.11
MEDITERRANEAN NEEDLE LEAVED TREE	1 (1)	11 (11)	0.00
TEMPERATE NEEDLE TREE	2 (2)	15 (15)	0.00
TROPICAL BROAD EVERGREEN SMALL TREE	0 (4)	35 (31)	4.52
TEMPERATE BROAD EVERGREEN SMALL TREE	7 (7)	52 (52)	0.00
BROAD SUMMERGREEN SMALL TREE	6 (5)	38 (39)	0.23
NEEDLE LEAVED SMALL TREE	0 (2)	20 (18)	2.22
PALMIFORM TUFT TREE OR TREELET	0 (2)	18 (16)	2.25
XERIC EVERGREEN TUFT TREELET	2 (1)	9 (10)	1.10
TROPICAL BROAD EVERGREEN SHRUB	7 (5)	37 (39)	0.83
MEDITERRANEAN EVERGREEN SHRUB	14 (8)	57 (63)	5.07
TEMPERATE BROAD EVERGREEN SHRUB	11 (11)	83 (83)	0.00
PERHUMID BROAD EVERGREEN SHRUB	1 (6)	53 (48)	4.68
NEEDLE LEAVED EVERGREEN SHRUB	7 (6)	47 (48)	0.19
MEDITERRANEAN DRAWF SHRUB	0 (2)	13 (11)	2.36
TEMPERATE EVERGREEN DRAWF SHRUB	0 (2)	13 (11)	2.36
BUSH STEM SUCCULENT	5 (2)	8 (11)	5.32
TROPICAL BROAD EVERGREEN LIANE	0 (3)	29 (26)	3.35
BROAD EVERGREEN VINE	9 (4)	24 (29)	7.11
BROAD SUMMERGREEN + RAINGREEN VINE	2 (1)	8 (9)	1.11
OTHER LIFEFORM	10 (6)	42 (48)	3.00

5 = OBSERVED NUMBER	CHI- SQUARE TOTAL = 57.84
(13) = EXPECTED NUMBER	DEGREES OF FREEDOM = 24
	P < 0.001

TABLE 7.24 LIFE FORM V'S INTRUSIVENESS

LIFEFORM	INTRUSIVE SPECIES	NON-INTRUSIVE SPECIES	X^2
TROPICAL EVERGREEN SCLEROPHYLL TREE	5 (13)	36 (28)	7.21
MEDITERRANEAN BROAD EVERGREEN TREE	3 (4)	7 (8)	0.36
SUMMERGREEN BROAD LEAVED TREE	20 (23)	54 (51)	0.57
TEMPERATE RAINFOREST NEEDLE TREE	0 (3)	10 (7)	4.28
MEDITERRANEAN NEEDLE LEAVED TREE	3 (4)	7 (8)	0.36
TEMPERATE NEEDLE TREE	4 (5)	13 (12)	0.28
TROPICAL BROAD EVERGREEN SMALL TREE	4 (11)	31 (24)	6.50
TEMPERATE BROAD EVERGREEN SMALL TREE	15 (18)	44 (41)	0.72
BROAD SUMMERGREEN SMALL TREE	22 (14)	22 (30)	5.04
NEEDLE LEAVED SMALL TREE	10 (7)	12 (15)	1.89
PALMIFORM TUFT TREE OR TREELET	2 (6)	16 (12)	4.00
XERIC EVERGREEN TUFT TREELET	6 (3)	3 (8)	4.13
TROPICAL BROAD EVERGREEN SHRUB	16 (14)	28 (30)	0.42
MEDITERRANEAN EVERGREEN SHRUB	32 (22)	39 (49)	6.59
TEMPERATE BROAD EVERGREEN SHRUB	26 (29)	68 (65)	0.45
PERHUMID BROAD EVERGREEN SHRUB	7 (17)	47 (37)	8.59
NEEDLE LEAVED EVERGREEN SHRUB	22 (17)	32 (37)	1.97
MEDITERRANEAN DRAWF SHRUB	0 (4)	13 (9)	3.78
TEMPERATE EVERGREEN DRAWF SHRUB	3 (4)	10 (9)	0.36
BUSH STEM SUCCULENT	10 (4)	3 (9)	13.00
TROPICAL BROAD EVERGREEN LIANE	4 (9)	25 (20)	4.03
BROAD EVERGREEN VINE	18 (10)	15 (23)	9.18
BROAD SUMMERGREEN + RAINGREEN VINE	3 (3)	5 (7)	1.33
OTHER LIFEFORM	19 (16)	33 (36)	0.81

5 = OBSERVED NUMBER	CHI- SQUARE TOTAL 87.85
	DEGREES OF FREEDOM = 24
(13) = EXPECTED NUMBER	P < 0.001

Australia include: the phanerophyte subdivisions of summergreen broad leaved trees, Mediterranean evergreen shrubs, and bush stem succulents; and within the liane subdivision, broad evergreen vines. Uninvasive lifeforms include: the phanerophyte subdivisions of tropical evergreen sclerophyll trees, tropical broad evergreen small trees and mesic summergreen shrubs; and tropical broad evergreen lianes. In addition to these lifeforms, temperate rainforest needle trees, and the chamaephyte Mediterranean dwarf shrubs are unintrusive in South-eastern Australia.

As discussed in Chapter 6.4, the relationship between lifeform and intrusiveness is not mirrored by the relationship between climate and lifeform. This suggests that certain of the woody lifeforms introduced into South-eastern Australia have structural or functional attributes that either restrain, or aid, their invasive potential across a wide range of climates.

7.21 Conclusion - Invasive plant attributes

Several genetic and phenotypic attributes have been associated with intrusive woody ornamental species in South-eastern Australia. Attributes which are significantly typical of invasive species include: a large number of chromosomes; vegetative reproduction; dioecism; ant dispersal; long lasting seed viability; and short life span. They belong to the Fabaceae, Rosaceae, Mimosaceae, Salicaceae or Oleaceae and have a middle of the range seed weight; reach reproductive age quickly; and are of the summergreen broad leaved tree, Mediterranean evergreen shrub, bush stem succulents and broad evergreen vine, lifeforms.

Baker (1965) drew up a list of the attributes of an "ideal weed," and much discussion has revolved around this list (Newsome and Noble 1986, Barrett and Richardson 1986, Grime 1986). Baker's definition of a weed is a plant that grows in areas markedly disturbed by people (Baker 1986). It is therefore of interest that several plant features appear both in Baker's list and in the above list of features of invasive species in South-eastern Australian bushland. These features are: great longevity of seed; rapid growth; early flowering maturity; and vegetative reproduction. In addition, invasive species tend to grow across a wide range of climatic and edaphic conditions, which equates to another of Baker's ideal weed attributes. The only recognised divergence between the attributes of South-eastern Australian

woody invasive species and those of the ideal weed, is that self compatibility is not a feature of the invasive species. It was not possible to compare all of Baker's ideal weed attributes to those associated with invasiveness. These attributes include whether a species has generalised germination or pollination requirements, how long it maintains seasonal seed production, its fecundity and ability to compete by special means such as choking growth or exocrine production. Nevertheless, it appears that several of the features associated with woody plant invasiveness are of more general importance to the ability of a plant to become widespread.

In chapter eight, the relationships amongst the invasive plant attributes and between these attributes and those of introduction pressure and environmental origin are established and discussed.

CHAPTER 8: THE IDENTIKIT PICTURE

In preceding chapters features of a species introduction pressure, environmental origin and physical make-up have been examined in isolation, where they where tested for an association and/or correlation with intrusiveness. In this chapter these features will be considered together, in an endeavour to produce a composite picture, or model, that best distinguishes invasive from non-invasive species. The emphasis will be on invasive species rather than all those that have become intrusive (i.e, immigrant and invasive species), because it is invasive species that will have significant and unplanned effects on the local biota. A composite picture which can decisively identify invasive from non-invasive species is, however, likely to provide accurate predictions of which immigrant species will become invasive.

8.1. The Attributes of Invasive Species

The attributes that will be examined in the production of the identikit model are those which have previously been associated with invasiveness and for which information on that attribute is recorded, or can reasonably be inferred, for at least one hundred of the species amongst the top five hundred plantings in either Adelaide, Canberra, Melbourne or Sydney. These attributes are:

1. the family to which a species belongs;
2. the type of dispersal to which its propagules appear to be adapted;
3. the type of lifeform;
4. the type of reproduction;
5. chromosome number;
6. seed longevity;
7. seed weight;
8. growth rate;
9. the time taken for first flowering;
10. whether a species is dioecious or hermaphroditic;
11. the minimum climatic distance between a species' area of origin and it's area of introduction;
12. the mean climatic distance between a species' area of origin and it's area of introduction;

13. the environmental range over which a species has it's natural distribution;
14. whether a species' natural distribution occurs over the units, associated with invasiveness, of Thornthwaite's moisture index, Budyko's radiative index of dryness, Koppen's 1938 classification and Walter's zonobiomes (see Table 5.3);
15. whether a species' natural distribution occurs over the units, associated with invasiveness, of Schmithusen's and Schimper and Faber's vegetation classifications (see Table 5.3);
16. whether a species' natural distribution occurs over the units, associated with invasiveness, of the FAO/UNESCO and U.S. Dept. of Agriculture soil classifications;
17. the period of a species' first recorded introduction to an area; and
18. the relative amount that a species has been planted.

8.2 The associations between the invasive attributes

Given that all of the above mentioned attributes have been associated with invasiveness, it is likely that many of them will be dependent on, or correlated with, each other. In order to understand what the key attributes of invasiveness are, it is necessary to determine these associations. This is particularly important, as the type of data used in this thesis do not identify attributes *causing* invasiveness, but only those *associated* with it. As an example, the data of appendix 7 indicates that of woody ornamentals introduced to South-eastern Australia, those that belong to a genus beginning with the letter A have a significant likelihood of being invasive (X^2=8.952, df=1, P<0.05), while species that belong to a genus which begin with the letter E have been significantly uninvasive (X^2=8.484, df=1 P<0.05). To state that an important component of invasiveness is the first letter of generic name is obviously nonsensical. It is also likely that other attributes that have been associated with invasiveness are unrelated to the invasive process, per se.

To test for associations between attributes, contingency tables were constructed using the sub-program CROSSTABS, available in the SPSSX computer package. The chi-squared statistic was used to test for dependence. In table 8.1 the significant associations amongst the physical attributes and some of the climatic attributes are shown. The inter-relationship of most of

Table 8.1: The associations between the key environmental and physical attributes

ATTRIBUTE	family	lifeform	dispersal	reproduction	growth	chromosome number	flowering	seed weight	seed longevity	dioecious	min. distance	environ. range	Koppen's Cs
FAMILY TYPE													
LIFEFORM TYPE	*												
DISPERSAL TYPE	*	*											
REPRODUTION TYPE	*	*	*										
GROWTH RATE	*	*	*	-									
CHROMOSOME NUMBER	*	*	*	*	-								
TIME TILL 1st FLOWERING	*	*	*	-	*	*							
SEED WEIGHT	*	*	*	-	*	*	*						
SEED LONGEVITY	*	*	*	*	-	*	*	*					
DIOECIOUS	*	*	*	-	-	-	-	*	*				
MINIMUM CLIMATIC DISTANCE	*	*	*	*	-	*	-	-	*	*			
ENVIRONMENTAL RANGE	*	*	-	*	-	-	*	-	-	*	*		
DISTRIBUTION OVER KOPPEN'S MEDITERRANEAN (Cs) CLIMATE	*	*	*	-	-	-	-	-	-	-	*	*	

* Significant association ($P < 0.05$)

\- No significant association

the environmental classifications has already been detailed in figures 5.1 - 5.4.

Table 8.1 illustrates that there is much inter-dependence amongst the attributes and that every attribute is at least associated with five others. (Association here implies that categories of the different attributes share and exclude similar species). Particularly significant relationships identified amongst the attribute categories are shown in table 8.2.

8.3 The Key Invasive Attributes

The high level of inter-relationship, between the factors that have been associated with invasiveness, suggests that many of the factors simply will provide different means of identifying the same group of invasive species. It is, therefore, likely that not all features will be required for the production of an invasive plant's identikit picture.

To determine the key identifying features, the data were subject to a logistic probability unit (logit) regression. In this regression, invasiveness is taken as the dependent or Y value. Invasiveness is a dichotomous variable as a plant is either invasive (1) or isn't (0). The question of importance is what is the probability that Y will have a value of one (1). In the regression it is assumed that Y is a function of a set of explanatory variables (climate, family, lifeform etc.) and that these variables account for variation in probability (Fomby et al. 1988). This assumption is analogous with the standard regression model in which the independent variables account for the variation in the mean, or expectation, of Y (Aldrich and Nelson 1984).

The logit function is the log of the probability of selecting invasiveness and the probability of selecting un-invasiveness, given the explanatory variables used. Coefficients are estimated by the maximum likelihood method, which picks coefficient estimates with the highest probability or likelihood of having obtained the observed value of Y (Aldrich and Nelson 1984, Yogo 1988). Standard errors were calculated to provide a measure of the likely variation in the estimated co-efficients from case to case.

Table 6.2. Significant associations (P<0.01) amongst attribute catergories

* Positive association

_ Negative association

	Herbaceous	Dioecious	Sexual Reproduction	Asexual Reproduction	Wind dispersed	Bird dispersed	Light seeds	Seed longevity <3 years	Seed longevity 3-8 yrs	Seed longevity >8 yrs	Fast growing	Early flowering maturity	Late flowering maturity	Chromosome No <25	Chromosome No >40	Small Environmental distribution	Large Environmental distribution	Small Climatic distance from SE Aust.	Moderate Climatic distance from SE Aust	Large Climatic distance from SE Aust	Occurs over Koppen's CS Climate
Myrtaceae	*		*		*		*		*		*			*		*		*			
Proteaceae			*													*		*			
Rosaceae				*					*								*		*		
Caprifoliaceae						*														*	-
Cupressaceae		*			*																
Salicaceae		*																			
Oleaceae															*						*
Pinaceae					*																
Fabaceae											*										
Tropical Rainforest Trees			*																		-
Tropical Evergreen Sclerophyll Trees					*				*		*		*					*			
Tropical Evergreen Microphyll Tree				*																	
Broad Summergreen Small Trees				*																	
Summergreen Broad Leaved Trees		*		*				*					*				*				*
Broad Evergreen vines				*		*											*				
Tropical Broad Evergreen Lianes																					-
Tropical Broad Evergreen Small Tr.																					-
Needle Leaved Evergreen Shrubs			*													*					*
Mediterrangan Evergreen Shrubs			*							*											*
Temperate Broad Evergreen Small Tr.																*					
Mesic Summergreen Shrubs																			*		-
Temperate Broad Evergreen Shrubs						*			*										*		
Sexual Reproduct.			■													*				*	
Asexual reproduct.				■											*		*				*
Ant Dispersed										*								*			
Bird Dispersed		*				■			*										*		
Wind Dispersed					■						*										
Dioecious		■				*											*	*			

In the regressions performed, explanatory variables were lumped together and a coefficient obtained. A particular variable was then removed and the regression preformed again. The t-statistic was then used to determine whether the removal of the variable significantly changed the coefficient, or probability of successfully identifying invasive from non-invasive species.

To reduce the amount of computer time required, the logit regression was employed in two stages. In the first stage all environmental units that were associated (either positively or negatively) with invasiveness (see table 5.3), were combined with the environmental range factor (i.e, the sum total of all environmental units over which a species naturally grows) and the minimum climatic distance, mean climatic distance and the climatic range factor derived from Nix's classification.

Of the thirty climatic factors examined only three factors added significantly to the identification of invasive from non-invasive species, in South-eastern Australia. These factors are the minimum climatic distance (derived from Nix's classification), environmental range and whether or not a species naturally grows over Koppen's Mediterranean (Cs) climate.

These three environmental features where then combined with the physical attributes identified in 8.1, and a similar logit regression analysis carried out. In this operation it was found that the majority of factors tested did add significantly to the precision of the regression. Attributes that did not add to the precision were whether the species was dioecious or hermaphrodite and the longevity of seed.

The key factors that identify woody invasive species in South-eastern Australian bushland are, therefore, family, lifeform, dispersal and reproduction type, growth and maturity rate, chromosome number, seed weight, an origin from Koppen's Mediterranean (Cs) Climate or from an area with a similar climate to that of area of introduction (as derived from Nix's classification) and the environmental range over which a species naturally occurs.

8.4. Weighting of the Key Factors

Having ascertained the key features of invasive species, one cannot assume that all of these features are of equal importance. In order to produce an accurate identification picture it is necessary to determine what weighting should be given to each feature or to categories within a feature.

To determine the above, contingency tables were produced, using the SPSSX Subprogram CROSSTABS, between invasiveness and each of the key features. The contribution of each cell in a contingency table to the overall level of the significance of association was used as a guide to the weighting that should be given to a key feature and/or its units. In figure 8.1 the weightings given to particular categories are detailed. These weightings represent the Chi-squared value of a particular cell, rounded off to the nearest whole number and multiplied by ten.

8.5 The identikit model

Figure 8.1 is a diagrammatic representation of the model developed to distinguish invasive from non-invasive woody ornamental species in South-eastern Australian bushland. The model consists of four elements:

- a **combination of all the key attributes** that are necessary to provide the best fit to a logit regression between invasiveness and attributes associated with it;

- a **weighting** of factors, based on the strength of the association, either + or - between a category of a factor and invasiveness;

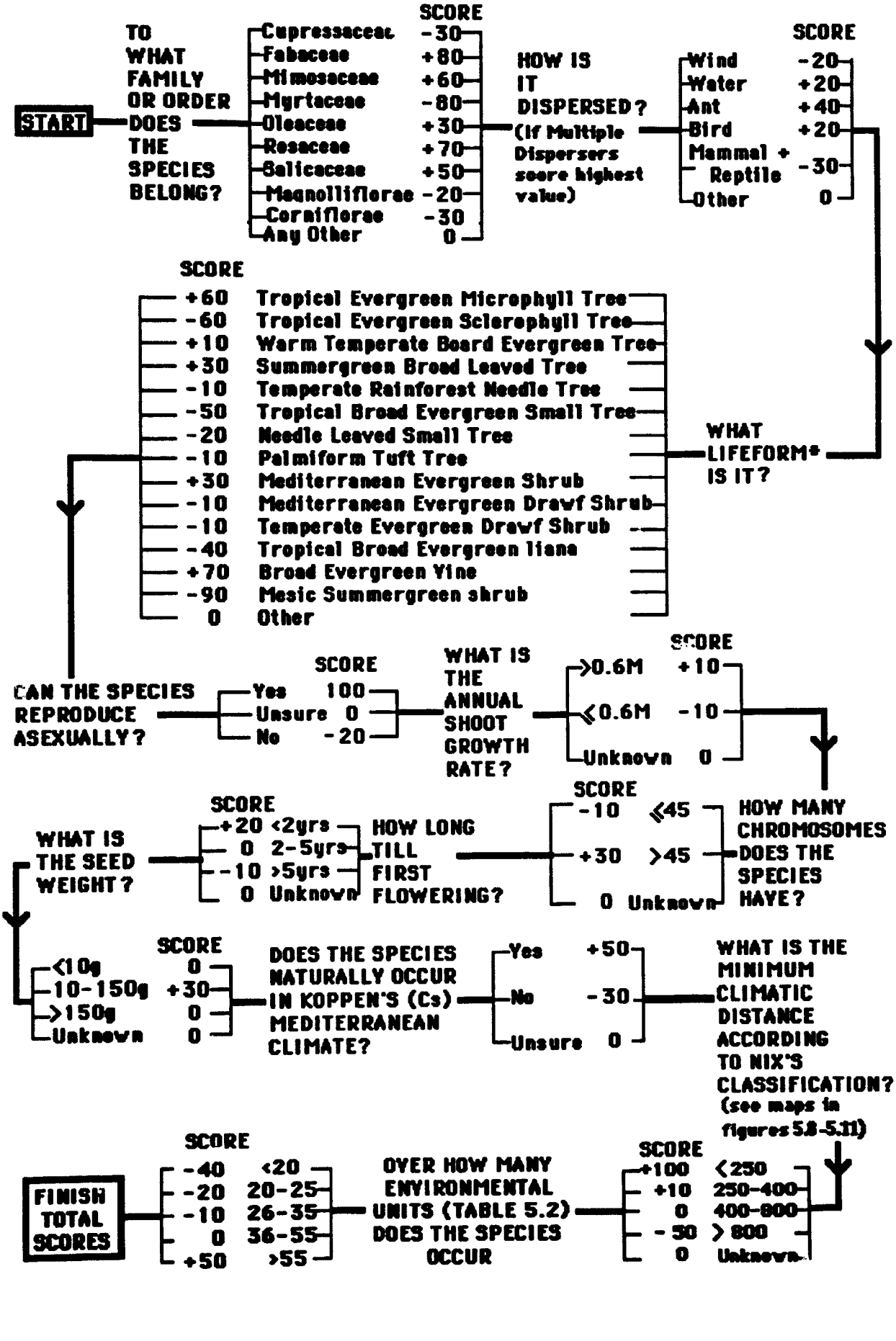
- a **stepwise process of questions** on each feature and an accruing score, depending on the answer; and

- a **final invasive score**, which ranks species according to the collection of invasive, uninvasive and neutral attributes they possess.

8.6 Testing the Model

Figure 8.2 is a plot of the modelled invasive scores, against the actual occurrence of invasiveness for all of the 781 commonly planted species in South-eastern Australia, for which information is known on at least five of

Figure 8.1. THE INVASIVE SPECIES MODEL



the key attributes. For species occurring in more than one city the maximum climatic scores were used. (The attributes of each species together with their maximum invasive score are detailed in appendix 7).

As is shown, the model has distinguished well between the invasive and non-invasive woody ornamentals of South-eastern Australia. Of the 410 (52% of total) species with an invasive score of twenty-five or less, only three (0.7%) have become invasive. None of the 237 (30% of total) species with an invasive score of -50 or less have become invasive.

Of the ninety-one species which were recorded as invasive in South-eastern Australia, sixty-one (66%) have an invasive score greater than 150. There are seventy-five uninvasive species with a score greater than 150. Twenty-five of these species are immigrants. Thirty (59%) of the Fifty-one species that have an invasive score greater than 250 are invasive in South-eastern Australia.

In table 3.1 a category of pest or widely invasive species is indicated. Of the eighteen such species for which an invasive score was calculated eleven are amongst the 51 species of the highest scoring category, while a further five occur in the next highest scoring category. The only pest species with a score below 150 are *Coprosma repens* (Mirror bush) 50 and *Chrysanthemoides monilifera* (Boneseed) 100. Both of these species are bird dispersed. Although bird dispersal per se is not a good identifier of invasive species, as there are many non-invasive bird dispersed species, the pest status of these two species is consistent with the observation discussed in Chapter 7.6, that the vast majority of invasive plants in the bushland studied are bird dispersed. It appears that once a woody ornamental species has become invasive in South-eastern Australia, whether or not that species is bird dispersed is an indicator to how widespread and dense it will become.

Figure 8.4 plots the invasive score against actual occurrence of invasive species in each of the cities studied. The climatic scores relevant to each city were used in these plots. While, individually, not as accurate as the combined South-eastern Australian plot, these plots do indicate a similarly high level of precision, for all of the cities studied, in distinguishing invasive from non-invasive species. In all cities roughly half of the

Figure 8.2: THE MODELLED INVASIVE SCORE FOR S.E. AUSTRALIAN INTRODUCTIONS V'S THE ACTUAL OCCURRENCE OF INVASIVENESS

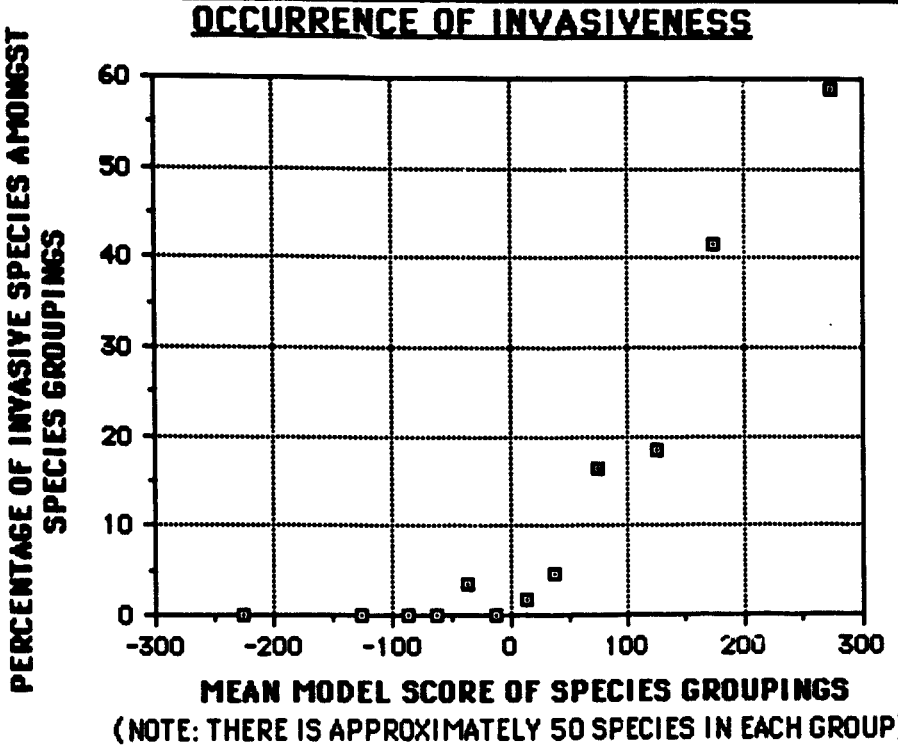
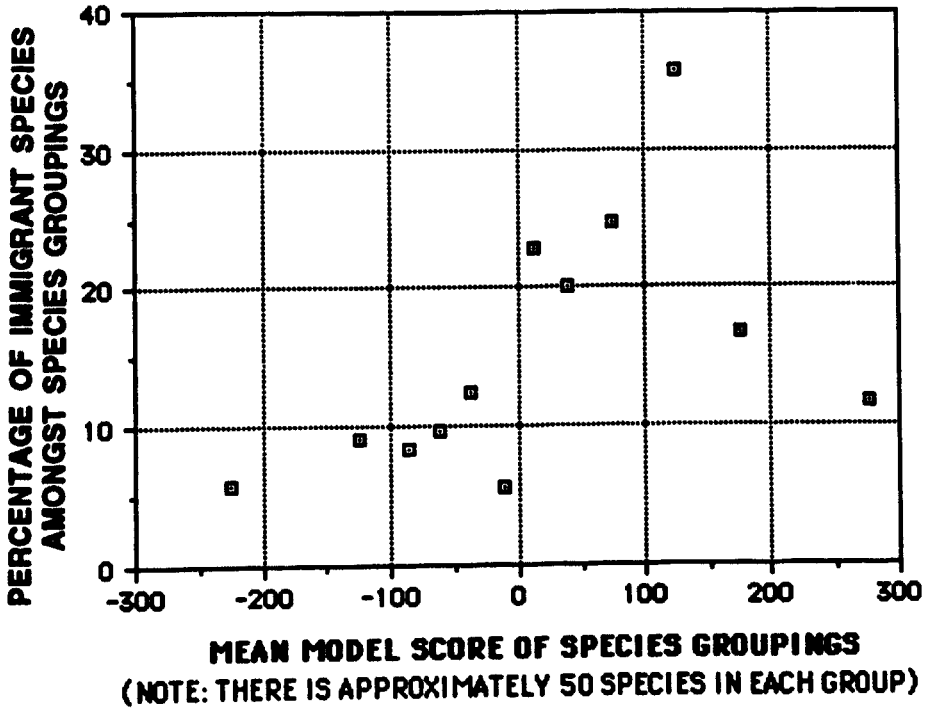


Figure 8.3: THE MODELLED INVASIVE SCORE FOR S.E. AUSTRALIAN INTRODUCTIONS V'S THE OCCURENCE OF IMMIGRANT SPECIES



approximately 425 commonly planted species have an invasive score of less than zero, and no more than 2% of these are invasive. It is also the case that the majority (70% in Adelaide to 92% in Canberra) of all invasive species have an invasive score of 150 or greater. Invasive species account for between 20% - 30% of all species in the top two invasive scoring categories, of roughly fifty species each.

It is important to note that of the cities studied, identification of invasive species was most accurate in Canberra, the city with the most detailed record of introduction pressure, and also the city whose bushland was most extensively studied. Thus some of the imprecision of the invasive species model may be due to lack of accuracy in the original data rather than to elements of the model itself.

Overall the Invasive Species Score Model is particularly efficient at identifying large groups of almost exclusively non-invasive species, which are those with a negative score. The only invasive species with a score of zero or less are *Pinus radiata* and *Grevillea rosmarinifolia* (Canberra), *Pinus radiata* (Adelaide), *Pinus radiata* (Melbourne) and *Pinus radiata, Coprosma repens,* and *Jacaranda mimosifolia* (Sydney).

Most invasive species have a score of over 150, though the majority of species with a score over 150 are uninvasive.

All of the five low scoring invasive species are popular plantings, while many of the high-scoring uninvasive species are uncommon plantings. Examples of the later include *Acacia decora, Acacia spectabilis, Amelanchier canadensis, Arctostaphylos uva-ursi, Cotoneaster lacteus, Correa glabra, Fraxinus pennsylvanica* and *Salix caprea.* This situation begs the question, how introduction pressure influences the outcome of the invasive species model.

8.7 The Invasive Species Model and Introduction Pressure

In the cities of Adelaide, Melbourne and Sydney an introduction pressure component, measured by the catalogue recorded introduction history, was added to the modelled invasive score, such that :

Period of first record	score	number of records	score
<1850	50	<6	-100
1850 - 1880	40	7 - 10	-50
1881 - 1900	20	11 - 12	-20
1901 - 1910	10	12 - 15	0
1911 - 1920	0	16 - 17	20
1921 - 1930	-10	18 - 22	30
1931 - 1940	-20	>22	50
1941 - 1960	-40		
>1960	-50		

For introductions to the city of Canberra, the period of first introduction was scored as above, while the number of planting of a particular species was gauged from a sampling of actual planting and nursery distribution records, such that:

Amount of recorded planting	score
<200	-100
200 - 300	-50
301 - 500	-20
501 - 1000	0
1001 - 2500	20
2501 - 5000	50
>5000	100

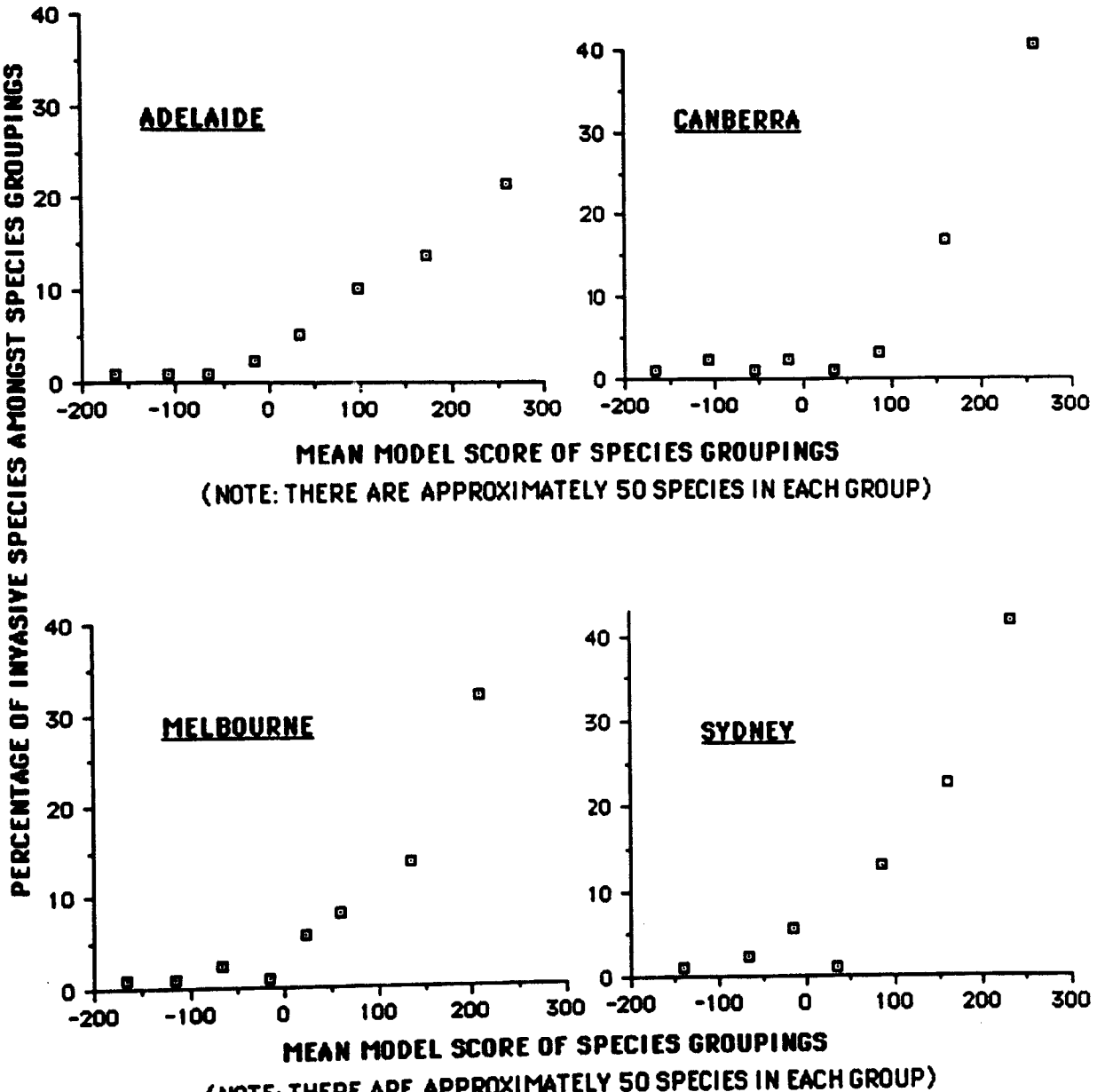
As shown (figure 8.5), the addition of an introduction pressure component to the invasive species score actually reduces the precision of the identification between non-invasive and invasive plants. Although some commonly planted and formerly low and moderate scoring invasive species are pushed up the invasive score continuum, another set of moderate to high scoring invasive but uncommon species plantings move down the same continuum.

These movements along the continuum, however, do provide much relevant information. Of the low scoring invasive species, *Pinus radiata*, *Grevillea rosmarinifolia*, and *Jacaranda mimosifolia* have been particularly common plantings, with an introduction pressure that moves them well up the continuum. One would predict that if these species lost popularity, then they would not appear as pests in bushland areas surrounding the future urban sprawl of the four cities studied. The promiscuity of *Grevillea* species must be remembered however, and it may be that hybrids involving *Grevillea rosmarinifolia*, such as the *rosmarinifolia X juniperina* cross which is an immigrant of Canberra's bushland, have sufficient key attributes to identify them as likely future pests.

The low score of *Pinus radiata* is particularly interesting, as it is a major invader of most areas of South-east Australia. *P. radiata* has a very restricted natural distribution and scores negatively on climatic attributes. It only grows naturally over one of Nix's climatic types, and this is not a close match to any where in South-eastern Australia, nor does it occur naturally over Koppen's Mediterranean (Cs) environment. It does however grow well in plantations and invasively spread from these in areas which do have a similar climate to South-eastern Australia (Wells et al. 1986, Esler and Astridge 1987, Krebs 1976). As discussed in Chapter 5.9, natural distributions are not only restricted by a plant's ability to grow and reproduce in certain climates, and there is a strong case when determining invasive potential for extending the climatic attributes to cover non-natural areas where a species is already known to be invasive. Nevertheless even with a high scoring climatic match *Pinus radiata* would still have a sub one hundred invasive score and one wonders how much more bushland would have been invaded in South-eastern Australia if some of the high scoring Acacias or Rosaceae (i.e, *Sorbus domestica* and *Pyracantha* species) had been planted to the same extent as *Pinus radiata*. Because of its large scale forestry and shelter belt use, *Pinus radiata* is one of the most planted woody species in South-eastern Australia.

Assuming that adequate opportunity is an important part of the invasive process (see discussion in Chapter 4.2), then one would expect that those species at the top of the invasive species continuum that have had little introduction pressure are the most likely to either become invasive, or, if already invasive, have the greatest potential to become more widespread

Figure 8.4 THE MODELLED INVASIVE SCORE FOR THE INTRODUCTIONS INTO THE S.E. AUSTRALIAN CITIES STUDIED V'S THE OCCURRENCE OF INVASIVE SPECIES



than they already are, should plantings continue. Species that fall into this category are listed below.

Table 8.3. Species with the Potential To Become Invasive Or, if already so, to become more Widespread

ADELAIDE

Currently invasive: *Albizia distachya, Acacia saligna, Chrysanthemoides monilifera, Erica lusitanica* and *Lycium ferocissimum.*
Currently immigrants: *Acacia cyclops, Cotoneaster simonii, Cotyledon orbiculata, Kennedia nigricans* and *Pyracantha angustifolia.*
Currently unintrusive: *Acacia decora, Amelanchier canadensis, Celtis australis, Erica baccans, Gleditsia sinensis, Jasminum fruticans, Ochna multiflora, Psoralea pinnata, Pyracantha crenulata* and *Spartium junceum.*

CANBERRA

Currently invasive: *Ailanthus altissima, Chamaecytisus proliferus, Cortaderia selloana, Genista monspessulana,* and *Lycium ferocissimum.*
Currently immigrants: *Acacia terminalis, Agave americana, Crataegus crus-galli, Olea africana Pyracantha coccinea,* and *Spartium junceum.*
Currently unintrusive: *Cotoneaster dammeri, C. lacteus, Gleditsia triacanthos, Hedera canariensis, Indigofera incarnata, Kennedia nigricans, Populus tremula* and *Prunus avium.*

MELBOURNE

Currently invasive: *Acacia terminalis, Lycium ferocissimum, Genista monspessulana, Chrysanthemoides monilifera* and *Erica lusitanica*
Currently immigrants: *Asparagus scandens, Genista linifolia* and *Spartium junceum*
Currently unintrusive: *Erica baccans, Kennedia nigricans, Ochna multiflora* and *Pyracantha coccinea*

SYDNEY

Currently invasive: *Genista monspessulana, G. linifolia Chrysanthemoides monilifera, Aloe saponaria, Senecio mikanioides* and *Araujia sericifera.*

Currently immigrants: *Acacia saligna, Albizia distachya, Cassia floribunda, Cotyledon orbiculata, Opuntia stricta, Polygonum capitatum, Senecio macroglossus,* and *Solanum mauritianum.*
Currently unintrusive:

The major failing in the precision of the Invasive Species Score Model is that it cannot identify a group that consists only of invasive species. Ideally all species above a certain score should be invasive.

Some of the high scoring non-invasive species have already been listed in the table 8.3 above, and it may be that lack of a large introduction pressure could account for their present uninvasive status. There is still, however, a large number of uninvasive high scoring species that have had considerable introduction pressures. Species in this category are listed below. (Those species with a **bold** type face, are species that belong to a genus that is already invasive in the city of their planting).

Table 8.4. Species with a high Invasive Species Score, that have been frequently introduced, but which are not yet invasive

ADELAIDE: ***Acacia mearnsii,*** *Acer negundo* ***Asparagus densiflorus, Asparagus officinalis,*** *Buddleia salvifolia, Buxus sempervirens, Calluna vulgaris, Chorizema cordatum, Coronilla valentina, Corylus avellana, Cotoneaster glaucophyllus, C. microphyllus, C. pannosus,* ***Crataegus laevigata, Erica baccans, Fraxinus excelsior, Fraxinus ornus,*** *Gleditsia sinensis, Hardenbergia comptoniana, Hedera canariensis, H. helix, Indigofera incarnata, Juniperus communis, Lantana montevidensis,* ***Lavandula angustifolia, Lavandula dentata,*** *Lonicera japonica, Ligustrum lucidum, L. sinensis, L. vulgare, Phormium tenax, Populus alba, P. nigra,* ***Prunus cerasifera, Prunus dulcis,*** *Pyrus communis, Quercus robur,* ***Rubus idaeus, Rubus ursinus,*** *Salix alba, Salix babylonica, Sorbus aucuparia, Robinia pseudoacacia, Rosa rubiginosa, Taxus baccata, Thymus vulgaris, Syringa vulgaris,* ***Ulmus glabra*** and *Vinca minor.*

CANBERRA: ***Acer pseudoplatanus, Albizia julibrissin, Cotoneaster buxifolius, C. franchetii, C. lacteus, Cytisus scoparius, Fraxinus ornus, F. pennsylvanica, Gleditsia triacanthos, Hedera canariensis,*** *Juniperus*

*communis, **Ligustrum lucidum, L. vulgare,** Phyllostachys nigra, **Prunus avium, Prunus laurocerasus,** Pyrus Communis, **Sorbus aucuparia, Ulmus glabra,** and **Vinca minor.***

MELBOURNE: ***Acacia decurrens, Acacia podalyriifolia,** Acer negundo, Agave americana, Ailanthus altissima, **Asparagus officinalis,** Buxus sempervirens, Calluna vulgaris, Cordyline australis, Corylus avellana, **Cotoneaster horizontalis, C. microphyllus, Crataegus laevigata, Fraxinus excelsior, Fraxinus ornus, Fraxinus oxycarpa, Hedera canariensis,** Jasminum fruticans, Juniperus communis, J. sabina, Lantana camara, L. Montevidensis, Lavandula stoechas, **Ligustrum vulgare,** Phormium tenax, Populus alba, P. nigra, P. tremula,* **Prunus avium, P. dulcis, P. laurocerasus,** *Pyrus communis, Robinia pseudoacacia, **Rubus idaeus,** Sorbus aucuparia, Syringa vulgaris, Ulmus carpinifolia, Ulmus glabra* and *Vinca minor.*

SYDNEY: ***Acacia dealbata,** Acer negundo, Acer pseudoplatanus, Ailanthus altissima, **Asparagus officinalis, Cotoneaster pannosus,** Cytisus scoparius, Indigofera incarnata, **Lantana montevidensis, Ligustrum vulgare, Populus nigra, P. tremula, Rubus discolor, R. idaeus, Salix alba,** Sorbus aucuparia, Vinca major, Vinca minor.*

A notable feature of the above list is that from one third (Adelaide) to two thirds (Canberra) of all species, belong to a genus that is invasive in the city of their planting. This result provides support to Ehrlich's (1986) claim that much can be learned about the invasive process, through focusing on closely related invasive and uninvasive species.

A further notable feature of the above list of high scoring uninvasive species is that, of the seventy-five different species listed, thirty are invasive in one or more of the other cities. The Invasive Species Score Model could accurately distinguish these species as invasive in South-eastern Australia, but lacked the precision to identify correctly in which city they are invasive.

It is probably true for some of the cases of misidentification, that the invasive species model has correctly identified species that will eventually become invasive. The components of the invasive score model have, however, been consciously selected to be widely applicable to all of South-eastern Australia's woody ornamental species. Thus it is possible that

several high-scoring species are uninvasive because of circumstances peculiar to their site of planting. It is also possible that chance is an important factor or that the high-scoring uninvasive species lack or possess a particular attribute not highlighted in the model.

8.8. The Invasive Score and immigrant species.

Plots which match the invasive score against the occurrence of immigrant species are shown in figures 8.3, 8.6 and 8.7. A general feature of the city plots is that the higher the invasive score the higher the probability of a species being an immigrant. For South-eastern Australia as a whole the most likely score for an immigrant species is between zero and 150. Few species are intrusive below a score of zero, while intrusive species with a score above 150 tend to be invasive. Again, adding an introduction pressure component to the invasive score model added little to the precision of the model.

Given that virtually all invasive species have a modelled invasive score of over twenty-five, then one would expect that immigrant species, with a score below this, are not likely to spread to any extent and become invasive. Immigrant species that fall into this category are listed below.

Table 8.5. Immigrant species with a low likelihood of becoming invasive

Adelaide - *Aesculus hippocastanum, Angophora costata, Buddleia madagascariensis, Calothamnus quadrifidus, Cestrum elegans, Cupressus goveniana, Darwinia citriodora, Eucalyptus ficifolia, E. globulus, Lagunaria patersonii, Melaleuca armillaris, M. hypericifolia* and *Nicotiana glauca;*
Canberra - *Buddleia davidii, Callistemon citrinus, Cupressus goveniana, Eucalyptus globulus, Hakea eriantha, Juniperus chinensis, Lonicera fragrantissima, Mahonia aquifolium, Nandina domestica, Spiraea cantoniensis, Spiraea japonica, Quercus palustris, Ulmus parvifolia* and *Yucca filamentosa;*
Melbourne - Acer *palmatum, Acmena smithii, Callistemon citrinus, Cupressus macrocarpa, Eriobotrya japonica, Eucalyptus botryoides, E. saligna, E. sieberi, Euryops abrotanifolius, Ficus elastica, Leycesteria formosa, Melaleuca armillaris* and *Solanum pseudocapsicum;*

Figure 8.5 THE MODELLED INVASIVE SCORE (INCLUDING AN INTRODUCTION PRESSURE COMPONENT) V'S THE OCCURRENCE OF INVASIVE SPECIES

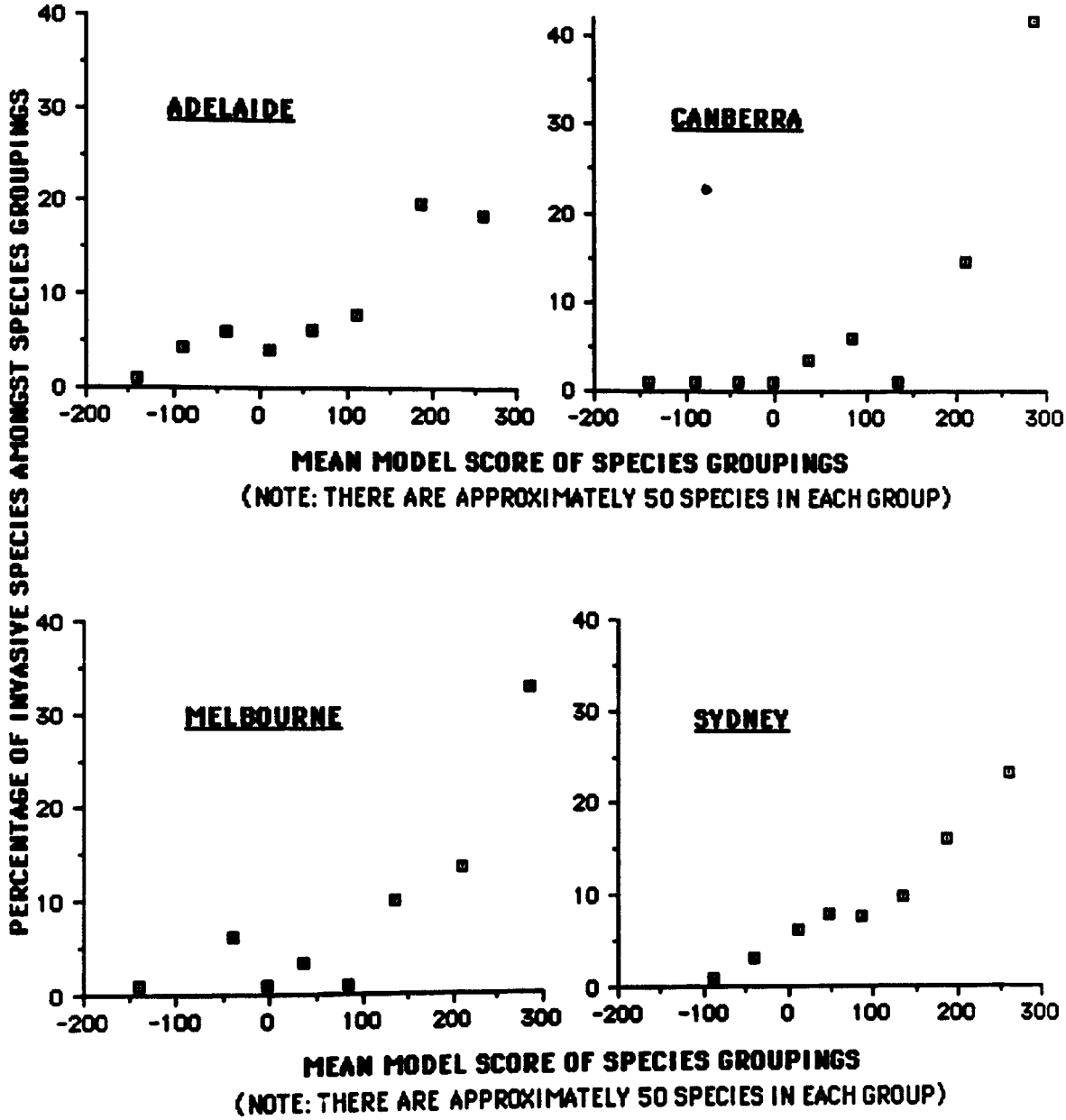
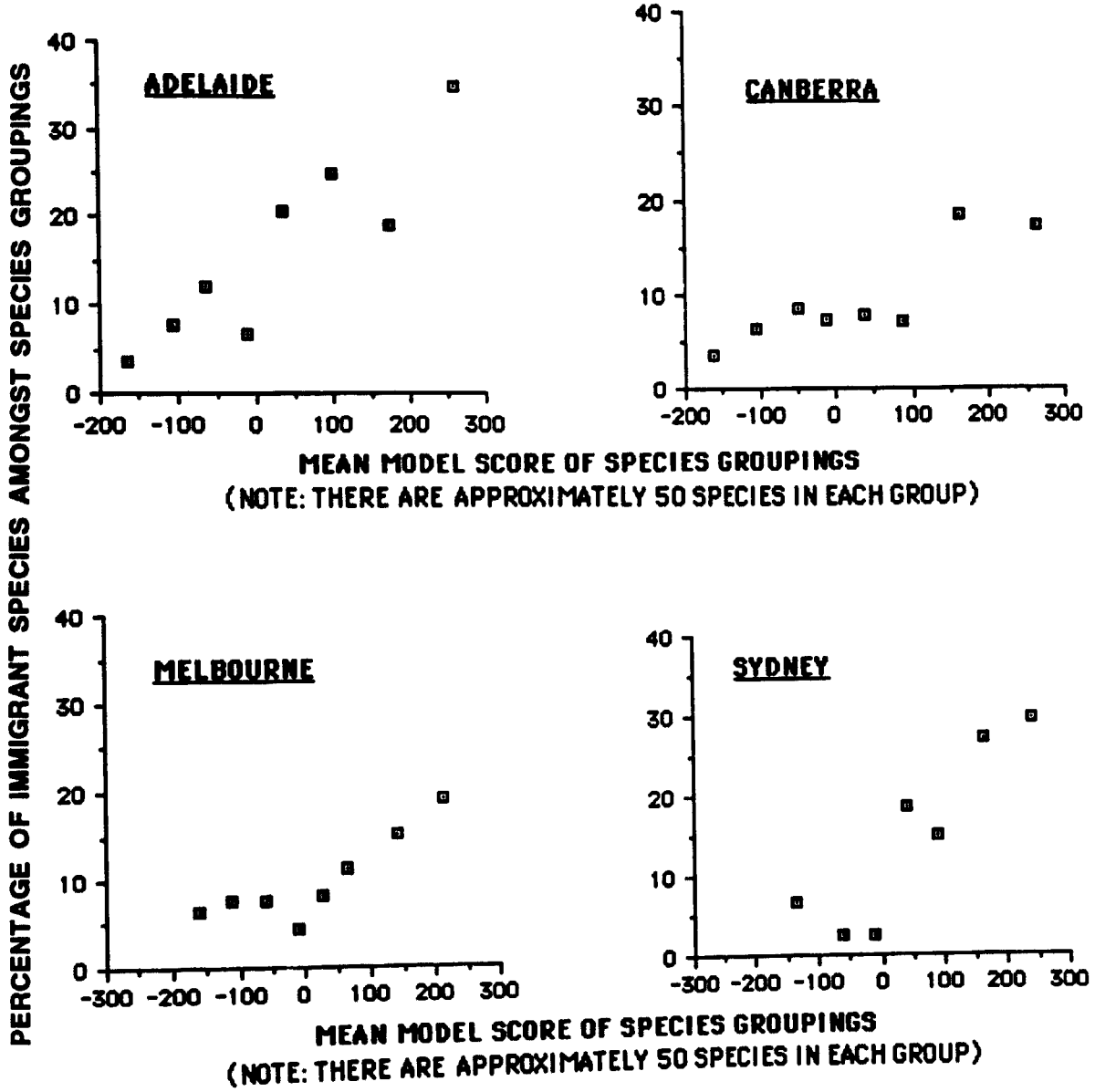


Figure 8.6 THE MODELLED INVASIVE SCORE FOR THE INTRODUCTIONS INTO THE S.E. AUSTRALIAN CITIES STUDIED V'S THE OCCURRENCE OF IMMIGRANT SPECIES



Sydney - *Eriobotrya japonica, Eucalyptus citriodora, Ficus elastica, Tristania conferta* and *Viburnum suspensum.*

8.9 The effectiveness of the invasive score.

The effectiveness of the model can perhaps best be determined by gauging its performance against a model in use by the Australian Quarantine Services for excluding potential weeds from being introduced to Australia. This model is similar to the invasive species model, in that it is an accruing point system model, in which plant environmental and physical attributes have been weighted. Details on how points are scored are given in figure 8.8. As can be seen, some of the features that score, such as plants harmful to people or animals, or that are spiny, are scoring more for the potential problems they may cause, rather than for their ability to distinguish weeds.

Quarantine model scores were calculated for the commonly planted woody species of South-eastern Australia. Species were then grouped according to their scores and the percentage of intrusive species in each group determined (Figure 8.9). In calculating the scores several assumptions had to be made:

- A similar habitat was defined only in terms of similarity in climate, as measured by Nix's minimum climatic distance (Shaded areas one and two in the maps in Figures 5.8- 5.11);
- A major weed was defined as any species that is naturalised in an area of similar habitat (climate). Because of the nature of this thesis, literature reviewed for records of naturalised species was biased towards those species spreading into natural, relatively undisturbed habitats;
- A close relative was one of the same genus; and
- A similar biology was defined as having the same lifeform (as defined by Box 1981(a)), and dispersal and reproduction mechanisms.

The major criterion whether or not a plant was harmful to animals or humans, was listing as such in Kingsbury (1978), McBarron (1976) or Hardin and Jay (1974).

As shown in Figure 8.9, the Quarantine model is not as effective at distinguishing uninvasive species as the invasive species model, though the precision at identifying invasive species is comparable. Ten (9.5%)

Figure 8.7 THE MODELLED INVASIVE SCORE (INCLUDING AN INTRODUCTION PRESSURE COMPONENT) V'S THE OCCURRENCE OF IMMIGRANT SPECIES

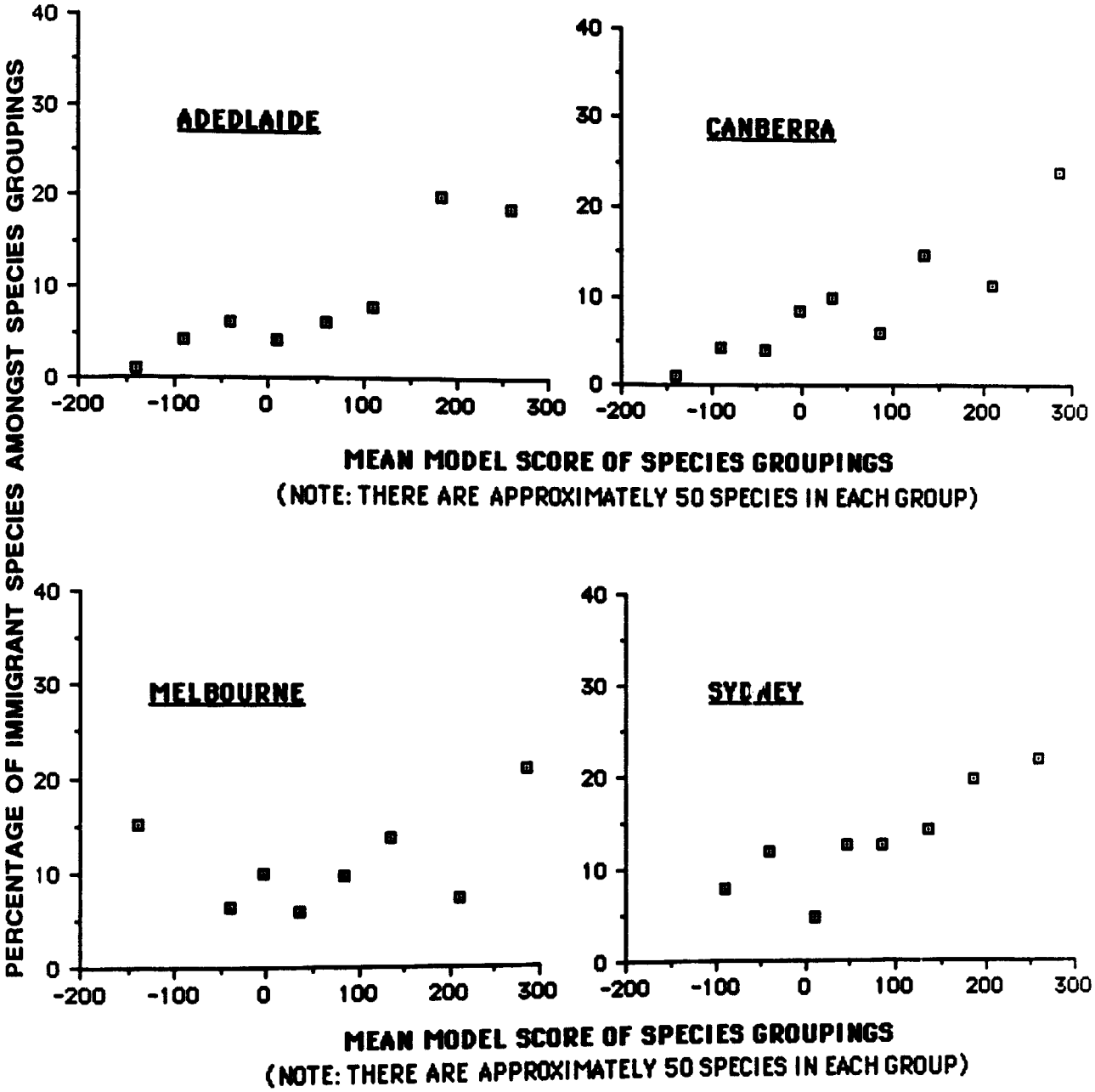


Figure 8.8 SCORING SYSTEM OF THE AUSTRALIAN QUARANTINE SERVICES FOR EXCLUDING POTENTIAL WEEDS

	Points
Is the species a free-floating aquatic?	20
Does the species have a history of being a major weed elsewhere in similar habitats?	20
Does the species have a close relative of similar biology with a history of weediness in similar habitats?	10
Does the species belong to the plant families Asteraceae, Amaranthaceae or Brassicaceae?	10
Are the plants spiny?	10
Does the plant have spiny diaspores (i.e., "burrs)?	8
Are the plants harmful to humans and/or animals?	8
Do the plants produce stolons?	5
Do the plants have other forms of vegetative reproduction (e.g. tubers of *Andredera)*?	8
Are the diaspores wind-dispersed?	8
Are the diaspores dispersed by animals and/or machinery?	8
are the diaspores dispersed by water?	5
Are the diaspores dispersed by birds?	5

Plants scoring 20 or over are rejected
Plants scoring 12 to 19 need further checking
Plants scoring less than 12 are acceptable

Note: Questions of no relevance to woody species are typed in plain ink.

invasive species scored less than twelve and are thus considered by the model to be acceptable introductions. The ten species are *Callistemon citrinus, Grevillea rosmarinifolia, Lavandula stoechas, Hakea laurina, Aloe saponaria, Dipogon lignosus, Erica arborea, Rhamnus alaternus, Tecomaria capensis* and *Aeonium arboreum.* A further two species *Myoporum parvifolium* and *Sollya heterophylla,* have a score between 12 and 19 and would require further checking against the attributes of the model before being classed as acceptable introductions.

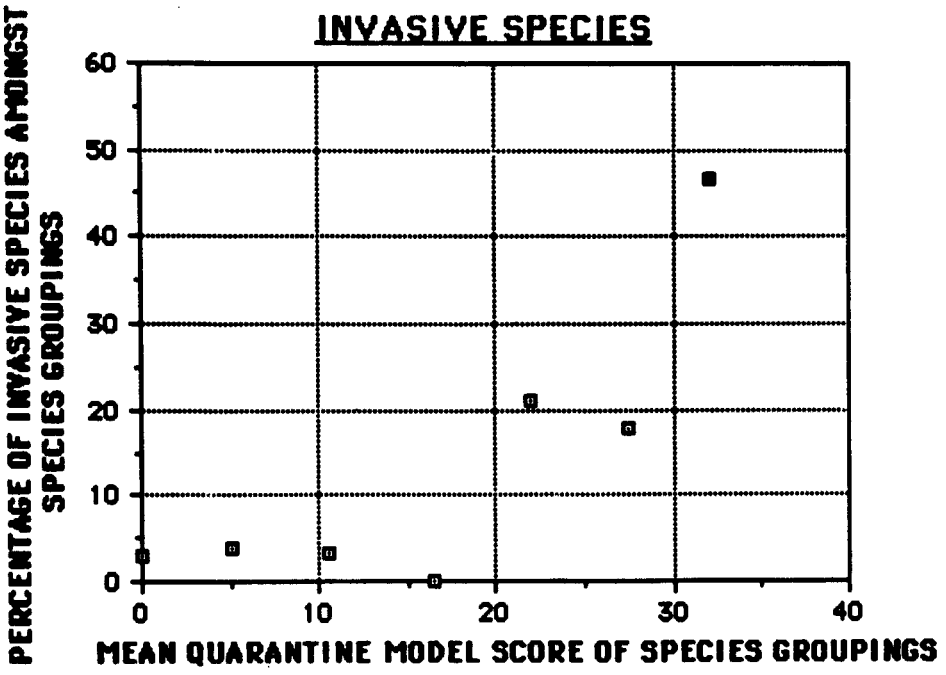
Nearly half of the sub-twenty invasive species are Australian natives, which are not of real relevance to the Quarantine model as it seeks to exclude only species being introduced to Australia, not redistributed around it. The effectiveness of the Quarantine model for non-Australian introductions is shown in figure 8.10. There are minor increases in the precision at identifying both invasive and non-invasive species.

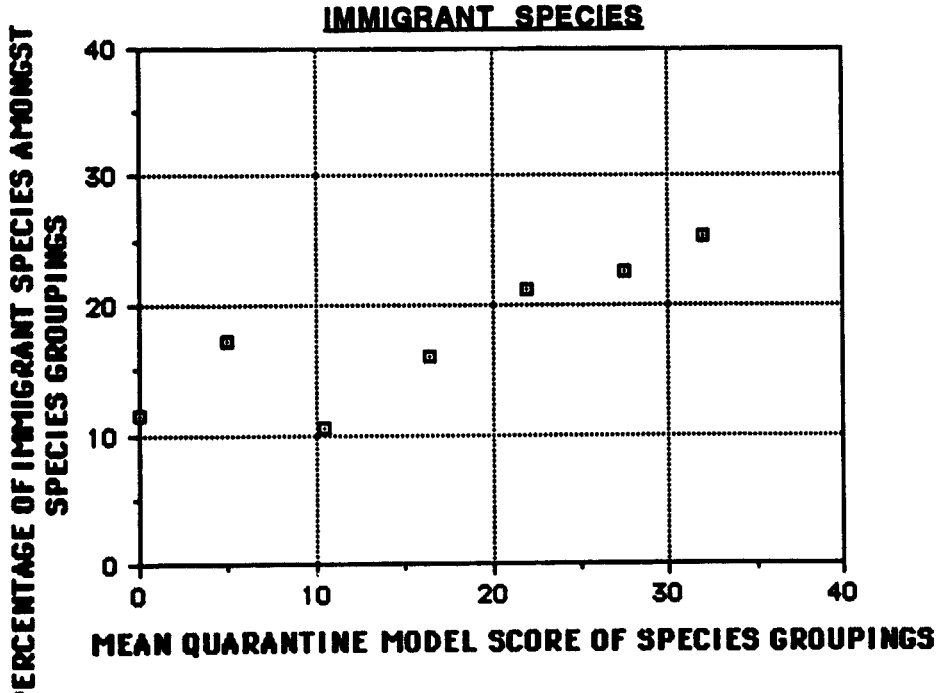
If the Quarantine model had been employed since 1788, then, of the 789 most commonly planted species introduced or redistributed to Australia, 320 (42%) would not have been acceptable introductions. Amongst this number would have been all the species identified in table 3.1 as pests and widely invasive and roughly 88% of all invasive species.

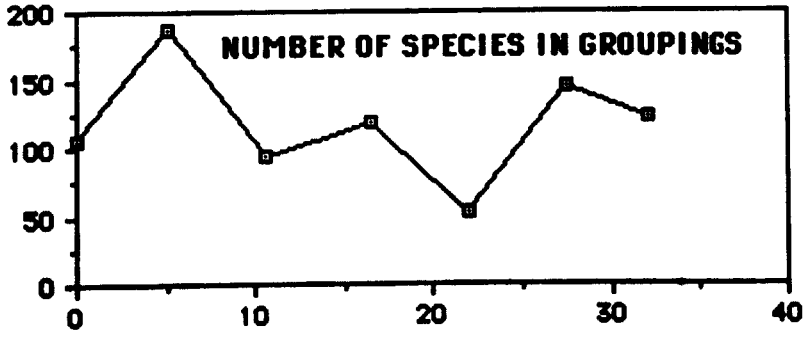
A prominent feature of the Quarantine model, in relation to woody species, is that a score of twenty or over is almost totally reliant on a species having a history as a major weed elsewhere in similar habitats, or on a species having a close reiative of similar biology with such a weed history. Of the 320 species that scored twenty or over, only twenty-four species would have done so without consideration of weed history. The twenty-four species are largely spiny plants, that reproduce vegetatively and are bird dispersed.

Thus identification of similar habitats to those of Australia and a knowledge of the major weeds in these habitats is crucial to the accuracy of the Quarantine model, in distinguishing woody invasive from uninvasive species. Given the weightings within the Quarantine model, I suspect that this is true for all plant introductions. In testing the Quarantine model against the data of this thesis, several assumptions had to be made. In addition, although extensive invasive histories of habitats similar to South-

Figure 8.9 THE QUARANTINE MODELLED SCORE FOR S.E. AUSTRALIAN WOODY ORNAMENTAL INTRODUCTIONS V'S THE ACTUAL OCCURRENCE OF INTRUSIVENESS







eastern Australia can be obtained from references contained in this thesis, this is by no means a comprehensive review. There is a clear need for precise definitions within the model and for researched weed histories of relevant habitats to be incorporated into the model.

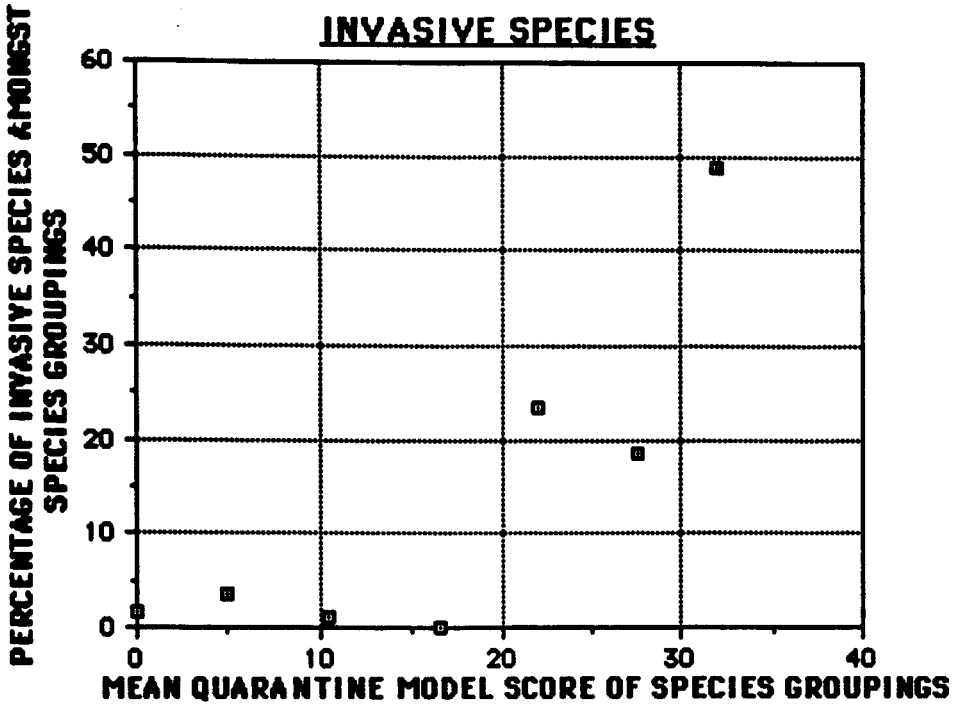
A problem with relying on weed history as a major determining factor is that it assumes that all species have had equal opportunity to behave as a weed. This is clearly false as not all species have been transported around the globe to the same extent. A factor which takes into account the amount of introduction pressure into habitats similar to those of Australia should be considered as part of the model.

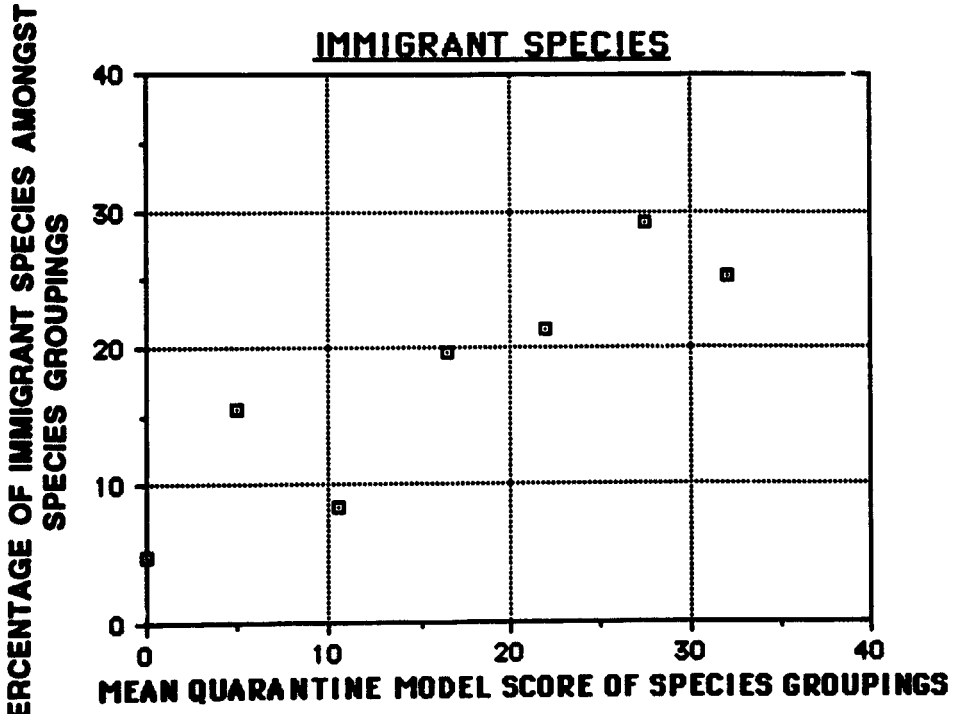
Nevertheless, the global weed history of a species and its close relatives is the major determining factor of the Quarantine Model, when applied to woody plants, and the model does has reasonable precision. There seems merit in incorporating this weed history factor in the invasive species model. This was done by adding a score of 100 to the total modelled invasive species score if a species is naturalised in an area of similar climate to South-eastern Australia, and a score of 50 if a member of the same genus, lifeform, dispersal and reproduction class is so naturalised. Figure 8.11 is a plot of these recalculated scores against intrusiveness. The major sources of weed history information were Wells et al. (1986), Rejmanek (1989), Carr (undated), Elias (1980), Tutin et al. (1964 - 1976), Holm et al. (1979), and Esler and Astridge (1987). The species listed in these works can be gleaned from Appendix 7, where they are Underlined and asterisked (*).

The incorporation of the weed history factor into the model improved its precision. None of the 286 species (36% of all introductions) with a sub-zero score is invasive. Of the 425 species with a score below fifty only two (0.26%), *Erica arborea* and *Grevillea rosmarinifolia* are invasive. Sixty-four of the 109 species with a score of over 250 are invasive. Of the ninety-one invasive species, eighty-one (89%) have an invasive score of above 150.

The revised and final invasive species model, incorporating a weed history factor, is given in figure 8.13. This revised model has a substantially higher degree of precision than that of the Quarantine model, when applied to

Figure 8.10 THE QUARANTINE MODELLED SCORE OF FOREIGN WOODY ORNAMENTALS INTRODUCED INTO S.E. AUSTRALIA V'S THE ACTUAL OCCURRENCE OF INTRUSIVENESS





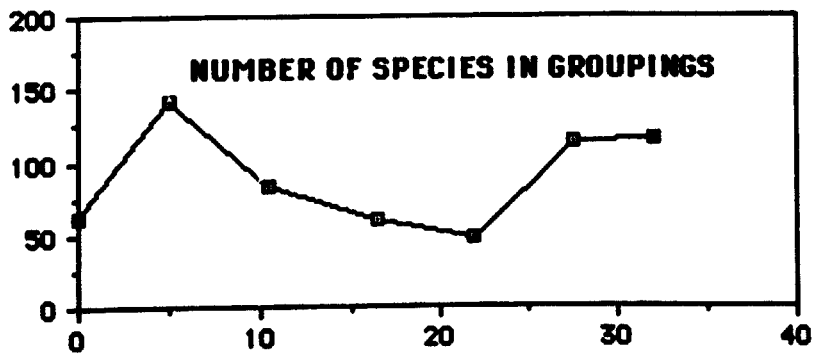


Figure 8.11 THE MODELLED INVASIVE SCORE (INCLUDING A WEED HISTORY FACTOR) FOR S.E. AUSTRALIAN INTRODUCTIONS V'S THE ACTUAL OCCURRENCE OF INVASIVE SPECIES

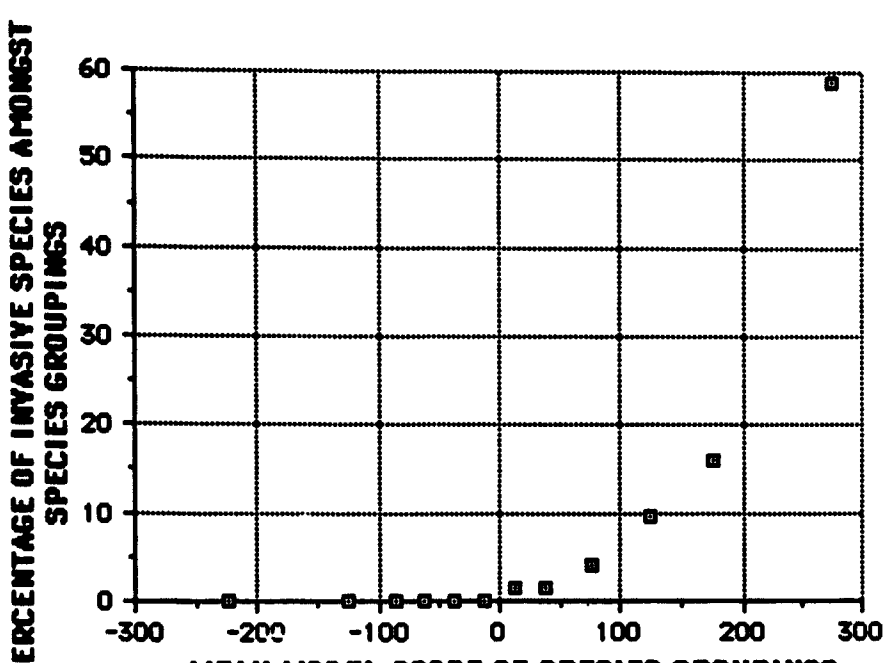
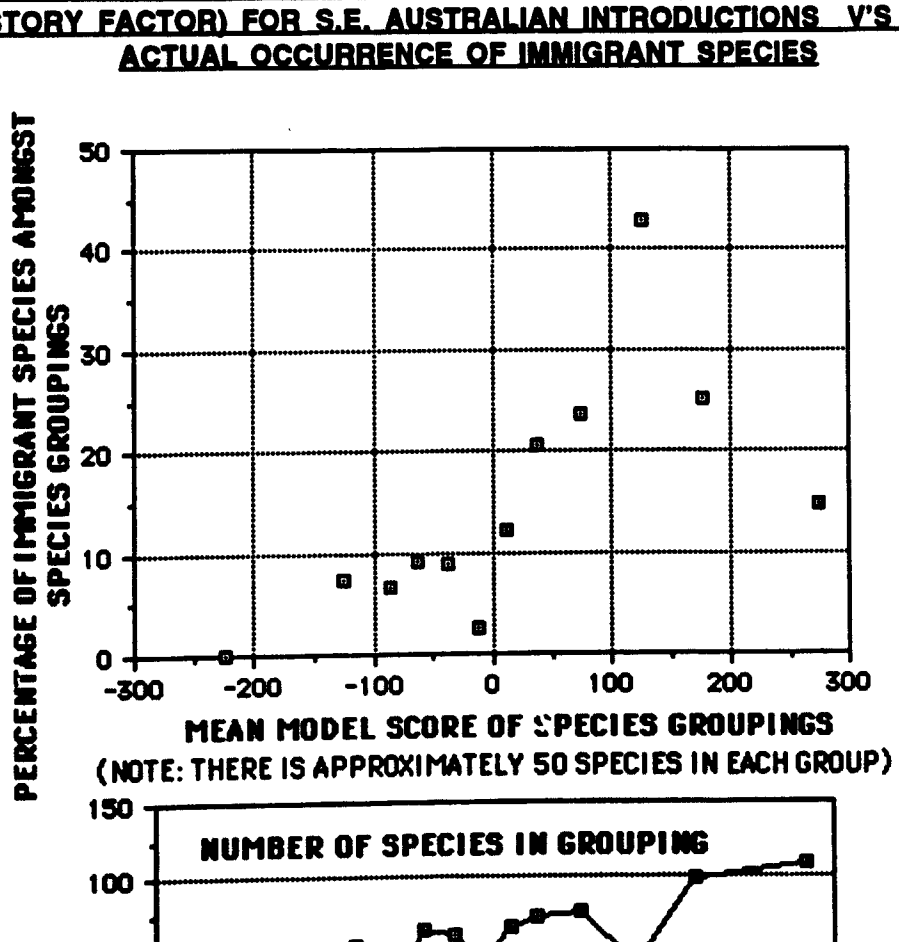


Figure 8.12 THE MODELLED INVASIVE SCORE (INCLUDING A WEED HISTORY FACTOR) FOR S.E. AUSTRALIAN INTRODUCTIONS V'S THE ACTUAL OCCURRENCE OF IMMIGRANT SPECIES



woody introductions. However, the Quarantine model requires less information input.

8.10 Applicability of Invasive Score to areas outside of South-eastern Australia.

The Invasive Species Model was able to distinguish invasive from non-invasive species in South-eastern Australia, but the question remains how applicable the model is to areas outside of those cities studied.

The data required by the Invasive Species Model consists of information on all introductions, both those that have become invasive and those that have not. Knowledge of introduction pressure was also a primary part of the information required. Unfortunately there are no other directly comparable sets of data, to that established in this thesis, that can test the applicability of the model elsewhere. There are, however, several data sets which can provide an indication of its global predictive potential.

In the use of these data sets, however, only the invasive behaviour, of species commonly planted in South-eastern Australia was considered. This is because considerable research is needed to collect sufficient information to satisfy the Invasive Species Model, restricting consideration to those species for which information had already been collated. Thus this trial of the model applies only to the behaviour of the commonly planted South-eastern Australian species outside of this region.

Test of the Model in South Africa

Poynton (1984) provides a list of recommended trees and shrubs for planting in ten climatic zones of South Africa. The climatic zones are determined using indices of rainfall, evaporation and temperature. The listings also indicate whether a recommended species has become naturalised or a pest in any of the climatic zones. Naturalised species are defined as those that show *"a tendency to spread from seed and become a nuisance ....* (but) *whose spread is more or less confined to sites where the ecosystem has been modified by exposure of the soil."* Pest plants are those that *"have acquired weed status locally and pose a threat to the undisturbed natural flora in situations which favour it.. for instance along watercourses.."*

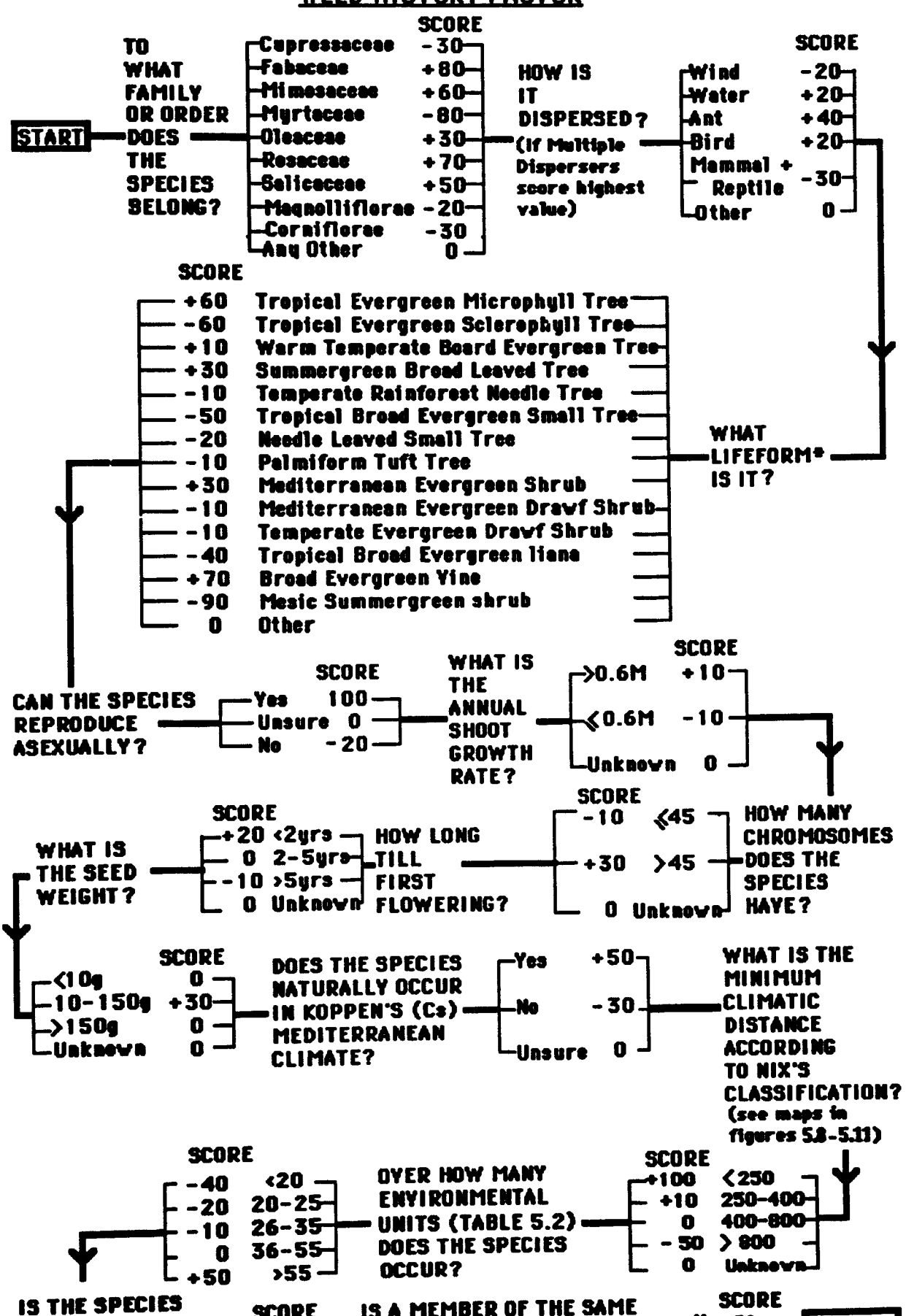
Thus Poynton's pest status is probably comparable to that of this thesis. A list of naturalised woody plants in South-eastern Australia derived from Poynton's definition would consist of some of the species listed as invasive in table 3.1, along with some of the immigrant species and also would include some plants not listed in this thesis because they occur in modified rather than bushland environments. Nevertheless the pest and naturalised species of Poynton (1984) share, with all of the invasive and immigrant species of South- eastern Australia, the ability to spread from garden plantings.

Poynton's listings provide no direct indication of introduction pressure, being simply recommendations for planting *"drawn on the assumption that the trees will not be watered or protected from frost once properly established."* The recommendation does, however, draw on the success of past plantings, and at the least indicates that a species has been planted in a certain climatic area. The recommended list is likely to have excluded many popular plantings that require a certain degree of nurturing. These omitted species are likely to have a relatively large climatic distance and are therefore likely to be low scoring in terms of the Invasive Species Model.

The South African climatic zones in which it was decided to test the invasive species model were the Humid - Summer Rainfall Area (As), which occupies the North-East coast of Natal, and the Sub-Humid Winter Rainfall Area (Bw), which occupies the low altitude areas of the South-western Cape (see figure 8.14). Part of the summer rainfall area shares the same Nix Globe-blioclimatic type as Sydney, while the climate of the winter rainfall area is analogous to that of South-western Western Australia, which is a moderate climatic match to the climates of Adelaide and Melbourne (see figures 5.8 - 5.11). Species native to South Africa were excluded from the analysis.

The Invasive Species Score was calculated for 177(As) and 151 (Bw) of the species recommended for planting. Amongst these 328 species are thirteen pest species. *Leptospermum laevigatum* (-50) was the only pest species in either area to have a negative invasive score, while nine of the thirteen species had an invasive score greater than 100.

Figure 8.13 THE INVASIVE SPECIES MODEL, INCORPORATING A WEED HISTORY FACTOR



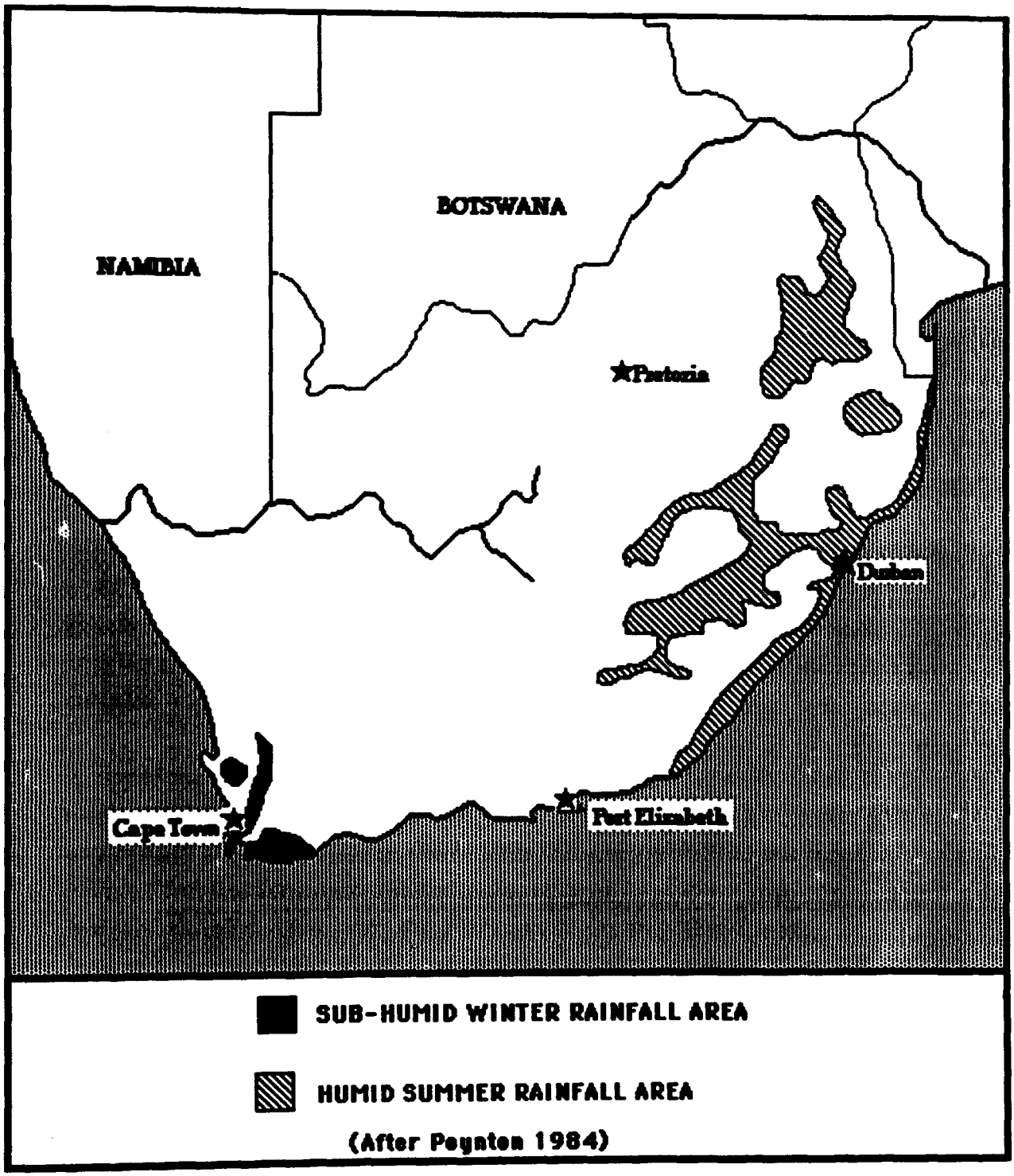
The occurrence of naturalised species, amongst the invasive scores of the recommended species for both climatic areas, is shown in figures 8.15 and 8.16. As shown, the general case in both areas is that the higher the invasive score, the greater the probability of a species being naturalised. The distinction between naturalised and non-naturalised species is however rudimentary, the exception being the high percentage (40 or 50%) of naturalised species among the twenty-five highest scoring species.

All ten naturalised species, of both areas, which have an invasive score below -100 are Eucalypts (*Eucalyptus botryoides, E. citriodora, E. elata, E. globulus, E. gomphocephala, E. macarthurii, E. maidenii, E. paniculata, E saligna* and *E. sideroxylon),* while members of the Myrtaceae account for eighteen of the twenty-seven naturalised or pest species, which have a score below zero. It would appear that the Myrtaceae are much more intrusive in South Africa than in South-eastern Australia, despite the latter being a more climatically matched environment for those species of the Myrtaceae introduced to either South Africa or Australia. Macdonald and Jarman (1984 p22) note that initial attempts at cultivating eucalypts from seed in South Africa failed, until soil containing mycrorrhiza was imported with seedlings. Isolation from appropriate mycrorrhiza might be an explanation for the inability of eucalypts that have been redistributed around Australia to become invasive.

High scoring naturalised, but non-pest, species in the summer rainfall area are *Acacia baileyana, Acacia elata, Acer negundo, Cotoneaster pannosus, Fraxinus angustifolia, Fraxinus pennsylvanica, Gleditsia triacanthos, Ligustrum lucidum, Pyracantha angustifolia, Pyracantha coccinea* and *Quercus robur.*

High scoring naturalised, but non-pest, species in the winter rainfall area are *Acacia baileyana, Acacia decurrens, Cotoneaster pannosus, Ligustrum lucidum, Melia azedarach, Pyracantha angustifolia* and *Pyracantha coccinea.* One would expect that future pest species, in these two South African climatic zones, will include several of these high scoring naturalised plants, particularly those species with only a recent high introduction pressure.

Figure 8.14: THE SOUTHERN AFRICAN CLIMATIC ZONES OVER WHICH THE INVASIVE SPECIES MODEL WAS TESTED.



Of the twenty-four high scoring (>150) non-naturalised species, in both climatic areas, twelve (those in **bold type face** below) have been classified as spreading species that are problem plants elsewhere in southern Africa (Wells et al. 1986). It would seem that the model is again more accurate over larger, rather than localised sites of introduction.

Table 8.6 Non-naturalised species of the summer rainfall area which score over 150

Acer pseudoplatanus, ***Ailanthus altissima,*** *Albizia julibrissin,* ***Cotoneaster franchetii,*** *C. lacteus, C. salicifolius,* ***Populus nigra,*** *Prunus cerasifera,****Robinia pseudoacacia, Salix babylonica,*** *Salix caprea,* ***Spartium junceum*** and *Tecoma stans.*

Table 8.7 Non-naturalised species of the winter rainfall area which score over 150

Ailanthus altissima, *Albizia julibrissin, Caesalpinia gilliesii, Celtis australis,* ***Cotoneaster franchetii,*** *C. lacteus, C. salicifolius, Fraxinus angustifolia,* ***Fraxinus pennsylvanica, Gleditsia triacanthos, Populus nigra,*** *Prunus cerasifera, Prunus laurocerasus,* ***Quercus robur, Rhus succedanea,*** *Sophora japonica* and ***Spartium junceum.***

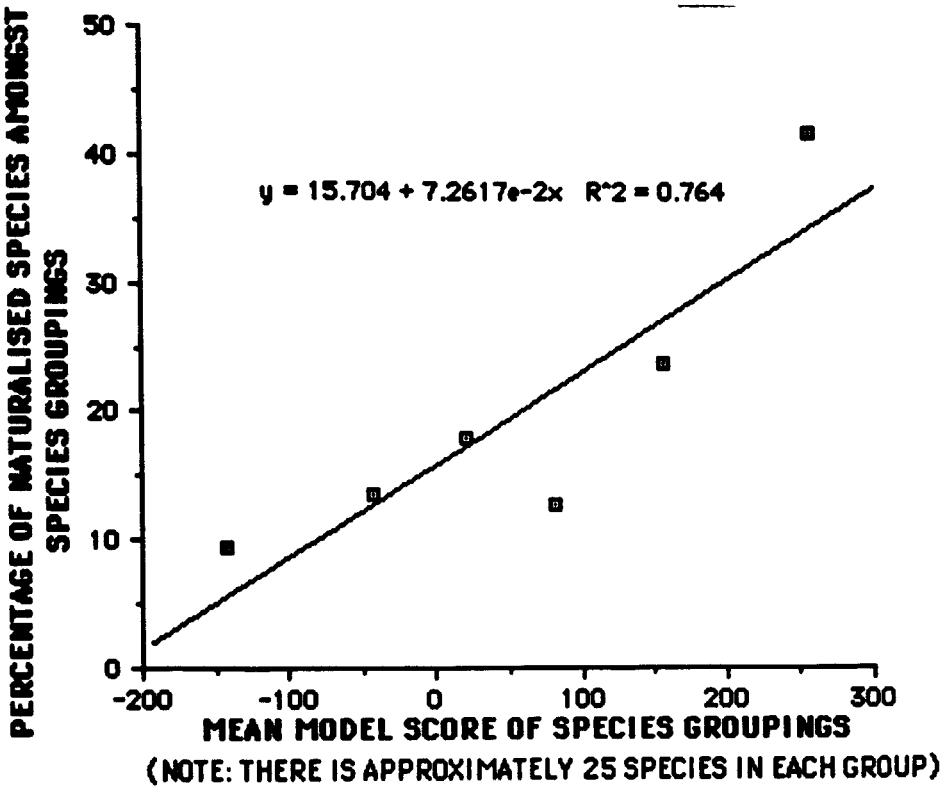
A significant proportion of those species with a high invasive score, that were introduced to the two climatic areas of South Africa, are in fact either naturalised or pest species in these areas. This suggests that the model devised for South-eastern Australian data does have relevance to the South African situation. However, the precision of the model is coarse.

Macdonald and Jarman (1984 p26) proposed a model or formula to describe the potential rate of spread of alien woody plants established in the fynbos of South Africa. Comparison of the differences between this model and the invasive species model, may provide reasons to account for the latter's imprecision. The formula of Macdonald and Jarman (1984), like the invasive species model, involves consideration of introduction pressure, plant attributes and environmental origin.

The formula is: Rate of spread = F x P x D + A + S + H

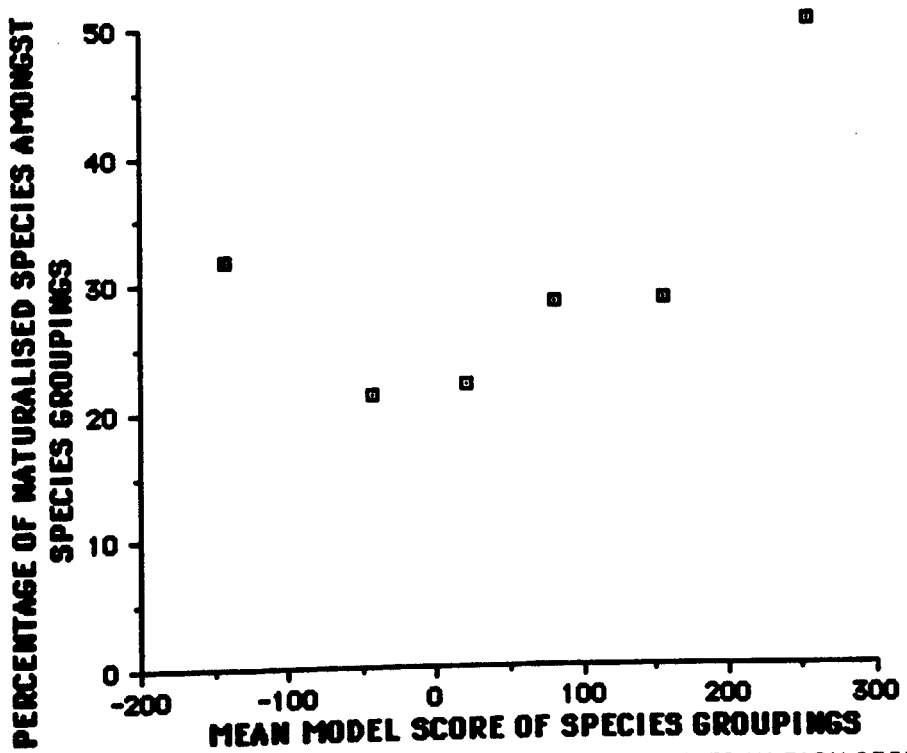
F = Fire-adapted (serotinous or fire stimulated germination)

Figure 8.15 THE MODELLED INVASIVE SCORE V'S THE OCCURRENCE OF NATURALISED SPECIES IN THE SUB-HUMID WINTER RAINFALL (BW) AREA OF SOUTH AFRICA



(NOTE: THERE IS APPROXIMATELY 25 SPECIES IN EACH GROUP)

Figure 8.16 THE MODELLED INVASIVE SCORE V'S THE OCCURRENCE OF NATURALISED SPECIES IN THE HUMID SUMMER RAINFALL (As) AREA OF SOUTH AFRICA



(NOTE: THERE IS APPROXIMATELY 25 SPECIES IN EACH GROUP)

P = lack of predators, especially for seed
D = Effective reproduction and dispersal rate
A = Pre-adapted, especially geo-climatically
S = Large seeded
H = Historical factor (1st recorded arrival of species in South Africa)

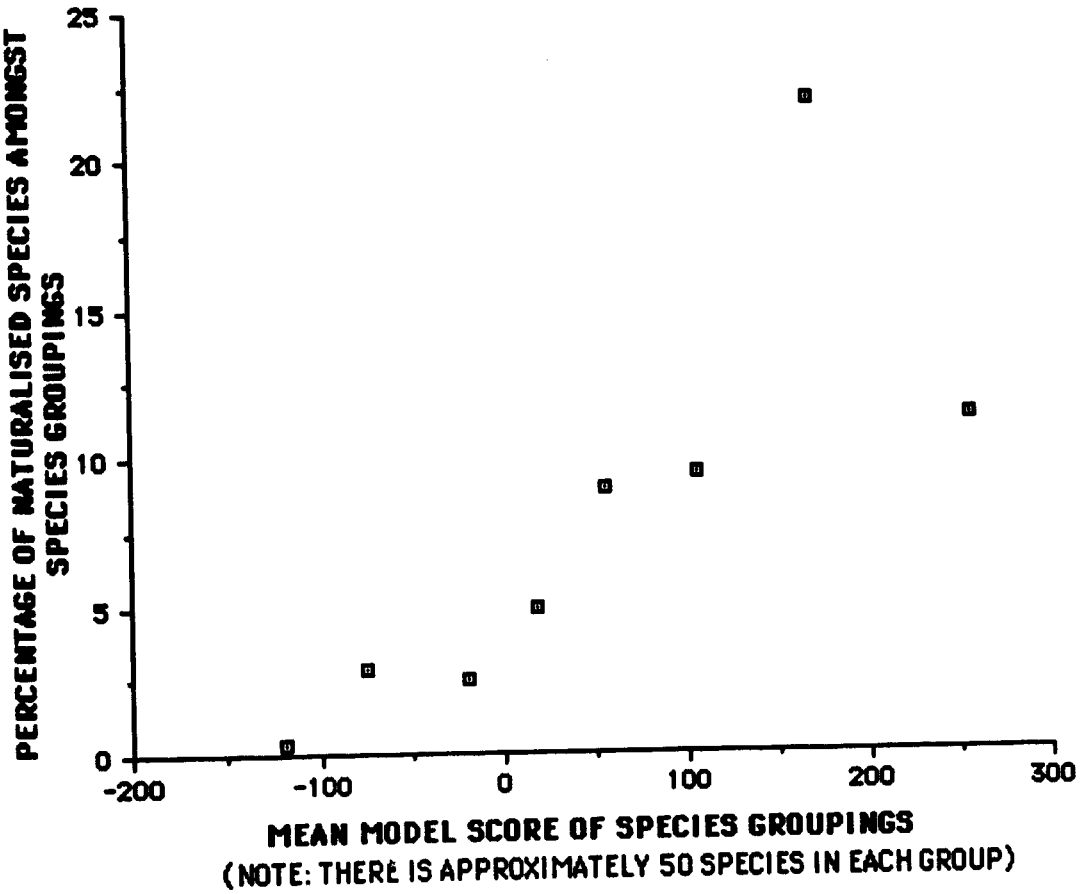
The formula was applied to 19 woody species, with a species' possession of each of the above attributes being subjectively rated on a scale of one to three. As with the invasive species model, *Acacia* species were amongst the highest scoring species. It is interesting that large seeded species, or those that are fire-adapted (Myrtaceae and Proteaceae), are not significantly invasive in South-eastern Australia, though Macdonald and Jarman's formula suggests that in the South African fynbos these features are important elements in the rate of invasive spread.

Test of the Model on Lord Howe Island

As detailed in chapter 4.5, the planting history of Lord Howe Island mirrors, to some extent, that of Sydney. Thus the list of common Sydney plantings established in this thesis can be combined with Pickard's (1984) list of plants naturalised on Lord Howe to provide a further test of the Invasive Species Model. However, it is important to note that Pickard makes no distinction between degrees of naturalisation, nor can it be ascertained whether a plant is naturalised in bushland or in modified areas. A plot which matches the modelled invasive scores against the occurrence of naturalised species on Lord Howe Island is shown at figure 8.17. As with the testing of the South African situation, naturalised plants on Lord Howe Island do tend to have a high invasive score, in relation to all species introduced to the island. Of the woody ornamental species likely to have been introduced to Lord Howe, 210 have an invasive score of zero or below. Of these only three (1.5%) have become naturalised. Of the 243 species with a score above zero, 26 (10.7%) have become naturalised. There is also a trend, though it is not a significant regression, for an increasing likelihood of a plant being a naturalised species with increasing invasive score.

The three naturalised species on Lord Howe Island that have an invasive score of less than zero are *Coffea arabica* (-60), *Punica granatum* (-60), and

Figure 8.17 THE MODELLED INVASIVE SCORE V'S THE OCCURRENCE OF NATURALISED SPECIES AMONGST THE PRESUMED INTRODUCTIONS TO LORD HOWE ISLAND



Tetrapanax papyirferus (-30). Species with an invasive score of over 200, but that are not naturalised on Lord Howe Island, despite the probability that they have been introduced there, are; *Acer pseudoplatanus, Ailanthus altissima, Bambusa arundinacea, Caesalpinia gilliesii, Cordyline terminalis, Cortaderia selloana, Cotoneaster microphyllus, Cotoneaster pannosus, Crataegus monogyna, Cytisus scoparius, Fraxinus excelsior, Gleditsia sinense, G. triacanthos, Hedera helix, Indigofera incarnata, Ipomoea purpurea, Lantana montevidensis, Ligustrum lucidum, Lonicera japonica, Passiflora manicata, P. mollissima, Plumbago auriculata, Populus alba, Populus nigra, Rubus discolor, Rubus ursinus, Rubus vulgaris, Salix babylonica, Sorbus aucuparia, Spartium junceum* and *Vinca minor.*

Test of the Model in a global situation

Holm et al. (1979) in their Geographical Atlas of World Weeds, provide a comprehensive account of the global spread of plant species beyond their natural ranges. Although it lists only those plants that have spread successfully from introductions, one would expect that if the Invasive Species Model has a global application then virtually all of the species listed by Holm et al. (1979) should have an invasive score above zero, with a large majority having a score above one hundred. Holm et al. (1979) do not define what they mean by a weed, but it is clear that their list focuses on crop situations rather than natural vegetation. The lists rank weeds into five categories: serious weed; principal weed; common weed; present as a weed but importance unknown; and present in the flora of the country but it is not known whether it behaves as a weed.

Of the woody ornamental species commonly planted in South-eastern Australia, Holm et al. (1979) list 227 naturalised occurrences in 117 countries, outside of South-eastern Australia. Species which are weeds in their country of origin were excluded from testing, as the data do not provide enough information to determine differences between regionally local and non-local weeds.

Of the 227 naturalisations 98 (43.2%) had an Invasive Species Score of over 200, while 169 (74.4%) of the naturalisations had a score of over 100. Only thirteen (5.7%) of the naturalised species have a score below zero. These are *Acalypha wilkesiana* (Jamaica -50), *A. wilkesiana* (Dominican Republic -50),

Syzygium jambos (Hawaii -40), *S. jambos* (USA -40), *Grevillea banksii* (Hawaii -40), *Nicotiana glauca* (Hawaii -30), *N. glauca* (NZ -30), *N. glauca* (Israel -30), *Hakea suaveolens* (NZ -20), *Ricinus communis* (Afghanistan -20), *R. communis* (Japan -20), *R. communis* (Korea -20) and *Celtis occidentalis* (Chile -10).

None of the fifteen serious weeds have a score below 100, while only one principal weed establishment (*Tibouchina semidecandra* Hawaii +70) has a score below 100. Thirty four of the forty three principal and serious weeds have an invasive score above 200.

It should be noted that three species, *Lantana camara, Ricinus communis* and *Psidium guajava,* account for eighty-eight (38.8%) of the 227 global naturalisations. The invasive scores of all naturalised occurrences are also likely to be artificially inflated by the nature of Holm et al.'s (1979) data, which only list country of establishment rather than precise location, such that the score associated with matching the similarity of the climate of introduction to source area draws from a much larger area than simply place of establishment. Nevertheless, if a neutral or zero climatic matching score is assumed for all introductions, then only seven out of the sixty-three species involved have a score below zero, while thirty species retain a score in excess of 150.

It is interesting to note that only two of the sixty three species listed belong to the Myrtaceae. This perhaps suggests that the intrusiveness of Myrtaceae in South Africa is the exception rather than the rule.

Conclusions from Tests

The tests of the model, by examining the behaviour of the commonly planted South-eastern Australian plants outside this area, suggest that the model identifies quite well the major woody pest species globally, and specifically in South Africa. The model is also reasonably successful in discriminating between naturalised and non-naturalised species in both South Africa and Lord Howe Island. The precision obtained in the identification of South-eastern Australian invasive species was, however, not replicated.

The differences in precision may result because the global tests were not able to take introduction pressure into account. In addition, a major part of the invasive model consists of direct (i.e, Koppen's Mediterranean (Cs) category) and indirect (i.e, lifeform) climatic components. Thus one would expect that the model will be directly applicable only to areas with a similar climate to that of South-eastern Australia.

Although it lacked precision, the testing of the Invasive Species Model has indicated that the model, or a version of it, has applicability to areas outside of South-eastern Australia, while within South-eastern Australia it provides fairly absolute probabilities that a species with a certain set of characteristics will or will not be invasive.

CHAPTER 9: CONCLUSION

The major task of this thesis was to determine the features that identify woody garden plants that have spread into bushland in South-eastern Australia, from those that have not. Once identified, these features may provide a means of predicting the future spreading of species.

The basic conclusion is that a combination of characteristics relating to introduction pressure, environment of origin, plant attributes and weed history, can provide fairly accurate and consistent statements of probability whether or not a species is invasive. The same features also distinguish immigrant species, but with a reduced level of accuracy.

The following features were found to be important in the identification of South-eastern Australian woody ornamental invasive species:

Introduction pressure
- the period over which a species has been planted;
- the amount a species has been planted;

Environmental attributes
- having a natural distribution across a climate similar to that of the site of introduction;
- having a distribution across a large number of climate, soil and vegetation types;
- having a natural distribution across Koppen's Mediterranean (Cs) Climate. (This was particularly so for Melbourne and Adelaide, the most Mediterranean of the cities studied, and is probably a further gauge of climatic similarity);

Plant attributes
- the family to which a species belongs;
- the type of dispersal, lifeform and reproductive system
- chromosome number
- seed longevity
- seed weight
- growth rate

- length of time to first flowering.

Weed history

- Species invasive in areas of similar climate to that of South-eastern Australia
- Species of the same genus, lifeform and dispersal and reproductive mechanisms is invasive as above.

The importance of the last two attributes was highlighted by the Quarantine exclusion model of potential weed species. The application of this model to woody species is almost totally reliant on information that considers whether a species or a near relative is a major weed outside Australia. This one feature was able to distinguish the invasive woody ornamental species in South-eastern Australia, though not to the same level of precision as the Invasive Species Model, of this thesis. Nevertheless, knowledge of the "weed" or invasive species, in one part of the world provides key information on the behaviour of species in other parts of the globe. Researched listings such as those of Wells et al. 1986, Carr undated, and Table 3.1 of this thesis appear to be vital to the future prediction of invasive species.

Of the attributes of the invasive species model, those identified as being key to any successful distinction of plant invaders were, introduction pressure, family, lifeform, asexual reproduction, climatic origin, the environmental width of a species natural range and invasive occurrence outside South-eastern Australia. All of these attributes have been previously linked with typical invading species. This thesis is unique in its combination of these attributes in an invasive species model and its focus on both invasive and uninvasive species. The resolution of the invasive species model is shown in figures 8.11 and 8.12.

9.2 The resolution of the invasive species model

The invasive species model identifies a group of 425 species (54% of all commonly planted species) where the probability of a species being uninvasive is 99.74%. The model also identified a group of 109 species (14% of all species) where the probability of a species being invasive is 58%. Seventy percent of all invasive species occur amongst this grouping of highest scoring species.

Although providing reasonably accurate and consistent statements of probability, this thesis has not been able to establish a method of categorical distinction. Further, the identification of invasive from non-invasive species is most accurate when taken over the larger generalised occurrence in South-eastern Australia, rather than in particular cities.

The usefulness of generalised statements of probability in the prediction of invasive species has frequently been questioned, on the basis that the uniqueness of both introduced species and their environments creates too many exceptions. It is argued that only models tailored to particular cases will provide the possibility of successfully predicting outcomes. (Brown 1989, Simberloff 1989, Crawley 1986). However, this position is taken without any detailed analysis, that predictions deriving from the comparison of smaller taxonomic units or cases, have greater accuracy than those deriving from more generalised sets of data. Richardson et al. (1987), by studying the reproductive ecology of four *Hakea* species invasive in South Africa, were able to relate invasiveness to the quantity of seed produced and the ability of seed to withstand fire. There is no certainty, however, that all *Hakea* species that produce an abundance of fire resistant seed will become invasive. One also would expect that the area of origin of a *Hakea* species, its lifeform, the size of its natural range and several other features would influence a species' invasiveness. One of the useful features of the generalised approach taken in this thesis, is that it establishes a framework upon which specialised case studies may be based.

The probabilities of invasiveness presented here have been based on an analysis of both success and failure to spread. This is unusual, as most predictions of invasiveness are derived purely from those plants that achieve success (Mooney and Drake 1989). A study based solely on invaders can never be certain whether the features shared by invaders are common only to that group, or whether they are possessed by most species, irrespective of invasiveness. Thus it is not surprising that the predictions contained in this thesis had a higher level of accuracy than expected, from other studies of invasive plant species.

9.3 Predicting uninvasive species

A feature of the invasive species model, established here, was that it was best at distinguishing groups of uninvasive species, rather than invasive species. This is expected because species with a low invasive score can be regarded as biological cripples with no chance of becoming invasive, whereas chance plays a role in whether species with a moderate or high invasive score (potential) actually become invasive.

To date, the major effort of invasive plant research has been to establish lists of invasive and potentially invasive species (e.g Macdonald and Jarman 1984, Rejmanek 1989, Holm et al. 1979), rather than of lists of those species with no, or minimal, probability of becoming invasive. A list of the latter kind for woody plants in South-eastern Australia is given in appendix 7, being those species with an invasive score below fifty. This list of uninvasive species is likely to prove as useful as a list of invasive species:

in deciding which non-local plantings to allow in an environmentally sensitive area (such as Lord Howe Island or on the borders of nature reserves);

in deciding which overseas species to allow into the country to satisfy nursery demand. As an example, the genus *Erica* is currently a popular planting, with much demand for importation of many of the hundreds of species native to South Africa, but not yet in horticultural use (Carr 1988). Being able to identify which *Erica* species have a minimal probability of successful spreading is as useful as knowing which species have a high probability of becoming invaders; and

in deciding which species can be safely used by land managers in such ob[illegible]tives as soil stabilisation, coastal erosion control, shelter belt plantings, or the establishment of a fodder crop

A conclusion, therefore, is that future studies in invasiveness should include a focus on predicting uninvasive species, as such predictions may prove to be more accurate, and equally useful, as those relating to invasive species.

9.4 Introduction pressure

Another conclusion is that introduction pressure is an essential factor by which to identify spreading from non-spreading species. In Canberra, where detailed records on the number of plantings of each of 1,990 non-local plantings have been kept, only two spreading species were amongst the 1,000 least planted species (0.2%), while 83 (8.3%) occur in the top 990 plantings. The introduction pressure in the cities of Adelaide, Melbourne and Sydney was gauged through the nursery catalogue recorded history. Similar results to the Canberra situation were obtained.

Many studies have questioned which factors determine the invasive potential of a plant species (e.g. Groves 1986, Noble 1989, Bazzaz 1986, Baker 1965, 1986), but few have considered the impact of introduction pressure. One of the major reasons for this is the difficulty in establishing what the introduction pressure for plants has been. The repetitive nature of the results from Adelaide, Melbourne and Sydney and their close agreement with those obtained from the detailed Canberra planting record, indicates that the use of nursery catalogues offers a reliable approximation of the introduction pressure of woody ornamentals. Many of the major libraries or archives throughout the world, contain collections of nursery catalogues (see Polya 1981). The study of nursery catalogues as a means of gauging the introduction pressure of ornamental plants is therefore a method with global applicability. Agricultural seed catalogues also form part of many nursery catalogue collections and these may provide a means of gauging the relative introduction pressure of agricultural species.

The results presented here, and by other studies (Shaunessy 1980, Forcella and Wood 1984, Newsome and Noble 1986, Williamson 1989) suggest that the accuracy of research comparing traits of invasive with those of uninvasive species, or degrees of invasiveness, will be heavily reliant on how well features of introduction pressure have been accounted for. For example, the analysis of Long's (1981) global bird introduction data-base in chapter 5 shows how important introduction pressure is in explaining the observed invasibility of islands to birds in comparison with continents, a point that has been previously overlooked (Loope and Mueller Dombois 1989).

The relationship between introduction pressure and invasiveness, identified for woody plants in South-eastern Australia, is one where probability of intrusive establishment is dependant on at least a moderate level of planting. This suggests that introduction pressure will not be of such importance to studies focusing on the traits of invasive species alone, as the vast majority of invasive species are likely to have been introduced above a certain level, where lack of opportunity to spread becomes the overwhelming factor. Focusing purely on invasive species is fraught however with the difficulty of not being able to test whether, or not, a trait, identified as common to invasive species, is generally common to all species.

The influence of introduction pressure on invasiveness, is ominous for the protection of natural vegetation from disruption by invasive species. It suggests that there are many species currently growing in South-eastern Australian gardens that have the potential to become serious invaders, but as yet they have not been planted in large enough numbers, or over a long enough period, to have had an opportunity to realise that potential. In chapter three it was calculated that only about 2.1% of all introductions had become invasive. However, amongst the top 781 plantings there are 91 (11.7%) invaders. It would seem that the majority of new invaders in the immediate future, will be from that group of species with a currently moderate, but increasing, introduction pressure. Species in this category include many Australian natives, but they are by no means confined to this group. A list of species predicted to become more widespread should planting continue is given in Table 8.3. Noticeably, the list includes several legume species that are currently being promoted as fodder crops, including *Chamaecytisus proliferus, Gleditsia triacanthos, Spartium junceum* and *Genista* species (Snook 1986). Increasing the introduction pressure of these species may threaten rural bushland areas.

The finding that the scale of introduction is an overriding factor for invasiveness, suggests that quarantine measures that detect most, but not all, of a species introductions may still achieve their objective.

9.5 Position of planting

The experience of non-local native plantings in the Adelaide Hills provides a salutary illustration that probability of establishment in bushland can be

greatly enhanced by a species being planted in or adjacent to an area of bushland

9.6 Inherent problems of the thesis

9.6.1 The broad approach

The accuracy of the invasive species model is likely to be as limited by the collation of generalised information on particular features, as by its actual inherent predictive power.

All measures of environment comparison hinged on knowledge of plant distribution. Because of the hundreds of species involved and their global distributions, occurrences were determined from generalised maps and written descriptions. Thus the scale of comparison was gross. The use of herbarium collection locations is one way that this broadness has been refined in comparative studies (for example Nix (1986) - elapid snakes and Booth et al. (1989) - eucalypts). Another approach, not employed in this thesis, but that may add precision, is a comparison of area of introduction with core area of origin. Hengeveld (1989) has found that species are most abundant in the centre of their range as this represents their optimum area for growth. In considering the potential invasiveness of individual species, there is also merit in comparing non-origin areas where the species is already known to have become invasive.

Another conclusion was that of the 166 units employed from nine climatic, two soil and two vegetation classifications, only Koppen's Cs Climatic unit and Nix's minimum climatic distance were required to provide maximum predictive power. A study based on more precise distributional data, and actual field recordings of soil, climate and vegetation type, may demonstrate that some of the other classifications tested do add significantly to the identification of invasive species.

Another problem with the broad brush approach adopted in this thesis was that it was reliant on existing information whether a species possessed a particular attribute. Thus attributes not well documented, such as fecundity, or the amount of genetic variation (determined through electrophoresis), were not included as part of the invasive species model, even though they may be of importance.

9.6.2 Escape from biotic load.

An acknowledged weakness of the thesis was its inability to distinguish, with any conviction, which plant species will gain most from escaping the predators, parasites, pathogens and competitors that constrain them in their native lands. But this is a question for which nobody has provided a convincing answer. Noble (1989) points out that a large flowering effort implies that, in the native habitat, there must be heavy losses, which may be due to predation, between this point and the establishment of a replacement adult. Due to lack of information it was difficult to assess fecundity, but rapid growth rate and early flowering were features associated with invasiveness, which also may be characteristic of species suffering heavy biological burdens.

It was theorised that the species to gain most from release of their biological burdens would be those most heavily attacked. Size of natural range and taxonomic isolation have been correlated with the number of plant eating species that occur in association with a particular plant species. These factors were also found to correlate with invasiveness. There are no data to sustain the supposition, however, that plant species which support the greatest number of herbivorous species suffer the greatest attack.

The major conclusion that arose, from an investigation into the competitive interactions between introduced and local species, was that temporary gaps, rather than permanent vacancies, were of importance.

9.7 Site specific characteristics.

It is likely that the nature of temporary gaps is important in determining which species become invasive and which do not. However, time restraints limited this thesis to an examination of invasiveness from a species view point only rather than of site properties which determine the invasibility of ecological systems. In reality, these two questions are linked, as certain sites will favour certain species. As examples, Macdonald and Jarman (1984) found that fire resistant species were the most invasive in the fire prone fynbos of South Africa, while the riverine habitat is the only habitat in which the various species of water dispersed willows are invasive in South-eastern Australia.

Mooney and Drake (1989) call for an alternative approach to categorizing features of invaders, through the role they play in community and ecosystem processes. In this context, Groves (1986, 1989) finds that invasive species are frequently early colonizers of disturbed sites in their area of origin. This would seem to be mainly the case for herbaceous species which form the bulk of early colonists. In chapter seven it was illustrated how dramatically bird dispersed species dominate amongst the invasive species of South-eastern Australian bushland. Fenner (1987) and Salisbury (1942) have noted that mid-successional stages in European ecosystems are characterised by a predominance of bird dispersed species. There would seem merit in applying Mooney and Drake's categorisation to a greater extent than was the case in this thesis. To do this, however, one has to be able to identify different community roles and be able to apply these roles consistently around the globe.

9.8 Application of the model

The interchange of plants across the globe, and the consequences of this are characterised by two overwhelming features:

1. Humans are the principal agents of introduction; and
2. The number of plants that have spread is small in relation to the number introduced.

The invasive species model provides accurate identification of groups of non-invasive and invasive species, and enables predictions of potential invasive species to be made. These predictions are based on a comparison of features possessed by current invasive and non-invasive species in South-eastern Australia. Obviously the model is most applicable to South-eastern Australia, though testing of the model to situations outside Australia suggested it has wider applicability.

The model should not be viewed as static, since environmental conditions are a fundamental element. Future climatic changes, alterations in fire regimes or other environmental aspects, may create different conditions suitable for species, which are presently confined by the lack of suitable habitats.

Above all, however, the model provides a means by which people may gauge the likely invasive spread of an introduced species, and provides a context to the advisability of selling, promoting or planting a certain species.

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CA 764, Parks and Garden Section
Accession no.
CP 209/2 Diaries of A.E. Bruce 1927-1930, 1935.
CP 209/3 Estimates submitted to the Federal Capital Commission 1929-1936
CP 209/4 Circular letters of Federal Capital Commission 1929-1936
CP 209/5 Dealings of the Visibility Committee 1937-1945
CP 209/8 Reports of Consultative Committee for Parks and Gardens 1939-1946,(large list of seed orders)
CP 209/10 Dealings of A.C.T. Aboriculture and Gardening Industrial Committee 1948-1950
CP 209/11 Files relating to the planted areas of Bullen Ridge, Mt. Stromlo and Green Hills 1918-1923
CP 209/12 Diary and General notes of T.C. Weston 1913-1921.
CP 209/13 Nursery operations 1913-1921
CP 209/17 Nursery operations 1926-1929
CP 209/18 Outwards papers from Yarralumla nursery 1912-1918

CP 209/25 Undated plant lists (Archives staff unable to locate this file.)
CP 209/26 Operations of Nurseries 1923-1926
A202 Establishment of nursery
A207 Establishment of nursery
A431 40/1802 Canberra Grammar School hedge planting
A431 42/5317 Trees, plants, shrubs, bulbs, distributed to persons and public bodies outside the A.C.T.
A431 44/1173 Forestry school requisitions
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A431 48/373 Plantations and tree plantings, City area
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A431 62/109 Supply and exchange of plant seeds etc. Forestry Bureau Canberra.
A431 62/252 Supply and exchange of plants with N.Z.
A431 63/80 Plant material given to Parks and Gardens
A431 65/144 Street planting Curtin 1965-1971
A431 66/38 Research into horticultural use of Australian plants.
A431 67/107 Woden Valley forward planting 1960-1969
A431 68/119 Screen planting Macquarie 1969

A431 68/132 planting in C.S.I.R.O. grounds
A431 68/146 Shelter belt planting Farrer
A431 68/152 Higgins and Scullin screen planting 1972
A431 69/153 planting in C.S.I.R.O. grounds
A561 Papers relating to the planting of trees by the Governor-General
A859/105 Plantings in aerodrome area
A859/126 Planting in Braddon area
A859/129 Planting around Hotel Canberra
A859/134 Planting along Commonwealth avenue
A859/207 Plantings at Royal Canberra Golf Links
A859/208 Plantings at Government House
A859/247 National Rose Gardens
A859/248 Plantings around Naval installations at Harman and Belconnen
A859/251 Memos to and from Auckland's Superintendent of Parks.
A859/260 Fraxinus oxycarpa seed sent from Adelaide
A859/264 Plant supply to tenants of Commonwealth houses, lessees and Members of Parliament 1949.
A860 1/8 Spraying Photinia for mildew control
A860 1/16 Hedges in Canberra
A860 2/8 Statistical records of Parks and Gardens
A860 2/15 Town planning
CA27 Department of Interior Files
38/30587 and 30588 plants, trees, shrubs, and bulbs supplied to persons and public bodies 1936
CA226 Federal Capital Commission
CP 698/6 General Correspondence - Royal Visits
Files held at Parks and Gardens Archives
The following files contain lists of species used in either street, public institution, Government housing, or screen, plantings, between 1945 and 1969.
60/251, 61/10, 61/33, 61/60,, 61/127, 61/132, 61/235, 61/259, 61/270 61/286, 61/359, 61/360, 61/417, 61/419, 61/414, 62/39, 62/92, 62/104, 62/106, 62/111, 62/114, 62/115, 62/130, 62/133, 62/149, 62/175, 62/177, 62/191, 62/270, 63/73, 63/77, 63/85, 63/115, 64/5 64/9, 64/39, 64/74, 64/79, 64/90, 64/129, 64/134, 64/152, 65/14, 65/46, 65/63, 65/77, 65/78 65/82, 65/124, 65/144, 65/146, 65/173,

65/190, 65/201, 65/232, 65/241, 66/36, 66/198, 66/208, 66/235, 66/241, 66/249, 66/276, 66/295, 66/297, 66/299, 66/302, 67/15, 67/50, 67/51, 67/117, 67/171, 67/173, 67/192, 67/195, 67/238, 67/251, 68/152, 69/51, 69/70, 69/71, 69/77, 69/79, 69/111, 69/153

FAR FROM THE GARDEN PATH:

An identikit picture of woody ornamental plants invading South-eastern Australian bushland.

VOLUME 2

Appendix 1(a). List of catalogues and sources used to gauge Sydney's history of woody ornamental plantings

1. Governor Phillip Gidley King	List of plants in the colony of NSW that are not indiginous. Barbourne Papers Vol.7 King, P.G. Mitchell Library A78-6 pl58-165.	March 20th 1803
1. Suttor, George	'TO BE SOLD' Fruit trees The Sydney Gazette and NSW Advertiser.	Sun May 20th 1804
1. Howe, George	Australia's first garden guide of 1806, observations on gardening. Reprinted Canberra: Mulini Press, 1980 16p (commemoration series No.3).	1806
2. Macarthur, William	Horticultural correspondence lists of plants 1817-1873. Macarthur papers A2943 Mitchell Library.	1817
	Lists of plants remaining alive on board the Lord Elden.Note book.	1833,1834
	Horticultural Note books. Macarthur papers. A2948. List of plants per sovereign.	
2. Jamison, John	Report of the Agricultural and Horticultural Society of NSW.	1829 SL (NSW)
2. The Australian	Fruit trees for sale at Mr Richard Mortimores', Parramatta.	April 25 1840
2. The Australian	'Choice trees' for sale by Mr John Rowley, Burwood Cottage.	June 2 1840
2. Sydney Gazette & NSW Advertiser	Report on introduction of date palm and olive.	May 23 1812
2. Sydney Gazette & NSW Advertiser	Report on extent and diversity of Australian horticulture.	April 22 1824
2. Sydney Gazette & NSW Advertiser	Report on varieties of fruit at Agricultural Societys' dinner supplied from Garden of Dr Townson & Capt. Piper.	Feb. 6 1823
2. Stackhouse, Jennifer 1981	Mr Macleay's Garden. Historic house trust of NSW. Elizabeth Bay House.	
3. Macarthur, William	Catalogue of plants cultivated at Camden (N = 221)	1843 SL (NSW)
4. Macarthur, William	Catalogue of plants cultivated at Camden(N = 433)	1850 SL (NSW)

5.Shepherd, Thomas W.	Catalogue of plants cultivated at the Darling Nursery, Sydney, NSW.(N = 786)	1851 NLA
6.Guilfoyle, Michael	Catalogue of plants for sale by Michael Guilfoyle, Nursery and seedsman, exotic nursery. Double Bay, Sydney.(N = 502)	1851 SL (Vic)
7. Macarthur, William	Catalogue of plants cultivated at Camden. (N = 594)	1857 SL (NSW)
8. Baptist, John Thomas	Catalogue of fruit trees, bulbus roots, flowering and oranment trees and plants (N = 477)	1861 SL (NSW)
8. Baptist, John Thomas	Catalogue of fruit trees, bulbus roots, flowering and ornament trees and plants Market Garden, Surry Hills. (N = 477)	1862 SL (NSW)
10. Ferguson, Francis	Catalogue of Plants, fruit trees, ornamental trees and shrubs. Australian Nursery, Camden. (N = 399)	1865/1866
12. Purchase, S.	General descriptive catalogue of ornamental trees, shrubs, new and rare plants, fruit trees etc. Somerset Nursery, Parramatta. (N = 349)	1871 SL (NSW)
13. Baptist, John	Catalogue of trees, shrubs, fruit trees, bulbs etc.	1875 ANU
14. Shepherd & Co.	Illustrated descriptive seed catalogue. (N = 189)	1883 SL (NSW)
15. Anderson & Co.	General catalogue.(N = 509) 216 + 218 Pitt St., Sydney	1884 SL (NSW)
16. Shepherd & Co.	Illustrated descriptive seed catalogue. (N = 220)	1885-1886 1887 SL (NSW)
17. Gelding, J. & W.	Catalogue of garden and farm seeds, plants, florists, flowers, bulbs, fruit trees etc. Victoria Nursery, Old Canterbury Rd., Petersham- *(N.= 670)*	1890
18. Graham, J. & Co	General catalogue. Nurserymen, seedsmen & florists No.6. The Strand, Sydney	1890 SL (NSW)
19. Anderson & Co.	General catalogue.(N = 515)	1890 SL (NSW)
20. Harries, J. & Co.	General catalogue of plants and seeds from John Harries & Co. florists.(N = 283)	1895 SL (NSW)
22. Anderson & Co.	General catalogue (N = 459) 216+218 Pitt St., Sydney	1899 SL (NSW)

23. Hunter, D.R. & Son	The up-to-date catalogue: seeds, plants trees, shrubs, manures, horticultural sundries. 218 Pitt St., Sydney (N = 313)	1902 SL (NSW)
24. Fergusson, F. & Son	Catalogue of trees, shrubs, roses etc Hurstville and Camden. (N = 485)	1904 SL (NSW)
25. Yates, Arthur & Co.	Seed Annual. (N = 148)	1905 SL (NSW)
26. Anderson & Co.	Plants and seeds. (N = 697)	1905 SL (NSW)
27. Anderson & Co.	Plants and seeds. (N = 722) 399 George St., Sydney.	1910 SL (NSW)
28. Shepherd & Sons Ltd.	General catalogue. (N = 242) 202 Pitt St., Sydney.	1914 SL (NSW)
29. Anderson & Co.	Plants and seeds. (N = 554)	1915 SL (NSW)
30. Anderson & Co.	Plants and seeds. (N = 486)	1920 SL (NSW)
31. Shepherd, P.L.C. & Son	Seeds, plants and fruit seeds.(N = 285)	1924/1925 SL (NSW)
32. Yates	General catalogue.(N = 43)	1924 SL (NSW)
33. Yates	General catalogue (N = 76)	1926 SL (NSW)
34. Milligan's Ltd.,	General catalogue. (N = 47) Botany Rd., Mascot, NSW.	1926/1927 SL (NSW)
35. Fergusson, F.	General catalogue. (N = 453) Hurstville and Camden, NSW.	1931 SL (NSW)
36. Hazelwood Bros. Ltd.	Favourite roses and other plants. Epping, NSW. (N = 577)	1933 SL (NSW)
37. Fergusson, F.	General catalogue (N = 527) Hurstville and Camden, NSW.	1935 SL (NSW)
38 Swane Bros.	Fruit trees, roses, shrubs, ornamentals etc. Enterprise Nurseries, (N = 169) Ermington and Rydalmere, NSW.	1936 SL (NSW)
39. Fergusson, F. & Son	General catalogue. (N = 569) Australian Nurseries, Hurstville, Camden and Mittagong, NSW.	1940 SL (NSW)
40. Anderson's Ltd.	Roses, fruit trees, shrubs and gladioli. (N = 465)	1941 SL (NSW)

41. Hazelwood Bros. Pty. Ltd.	General catalogue and supplement Epping, NSW. (N = 511)	1947 SL (NSW)
42. NSW Forestry Commission	Tree and shrub list (N = 240)	1954 Vic.(herb)
41a Anderson's Seeds Ltd.	Descriptive list of ornamental trees, and climbing plants. 90 Parramatta Rd., Summer Hill.(N = 349)	1954 SL (NSW)
43. Fergusson, F.	Ornamental trees, shrubs and flowering plants. 112-122 Port Hacking Rd., Sylvania. (N = 422)	1959
43a Hazelwood Bros. Pty. Ltd.	General catalogue Epping, NSW. (N = 530)	1957 SL (NSW)
44. Swane Bros.	General catalogue. (N = 458) Ermington, NSW.	1960/1961 NLA
45. Swane Bros.	General catalogue. (N = 354) Ermington, NSW.	1969
46. Hazelwood Nurseries	Trees and shrubs, general list. Dural, NSW. (N = 340)	1973 SL (NSW)
47. Swane Bros.	General catalogue. (N = 115) Ermington, NSW.	1974
48. Yates	Garden Guide for Australian Home Gardeners. Collins, Sydney. (N = 132)	1976 Edition
49. Swane's	Roses, fruit and shade trees for winter 1981.(N = 149)	1981 Swinbourne Collection

N = 221) = Number of identifiable woody plants in catalogue

SL(NSW) = Catalogue housed in the State Library of New South Wales

SL (Vic) = Catalogue housed in the State Library of Victoria

ANU = Catalogue housed at the Australian National University

NLA = Catalogue housed in the National Library of Australia

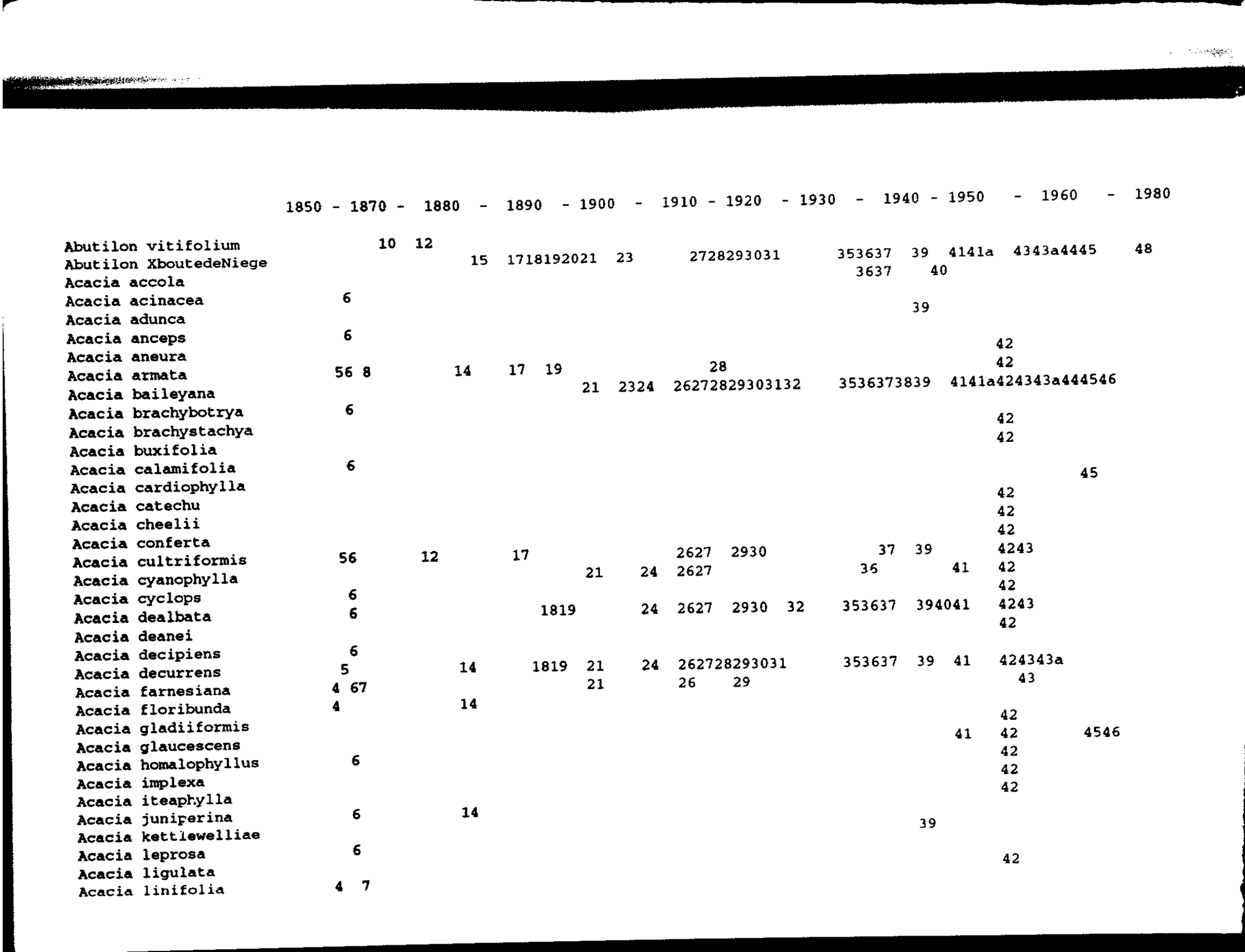
Vic(herb) = Catalogue housed in the National Herbarium - Melbourne

SA (herb) = Catalogue housed in the South Australian Herbarium

APPENDIX 1(b): STOCK LISTS OF THE SYDNEY NURSERIES STUDIED: 1803 - 1981.

Note: Numbers in table correspond to numbering of nurseries in Appendix 1(A).

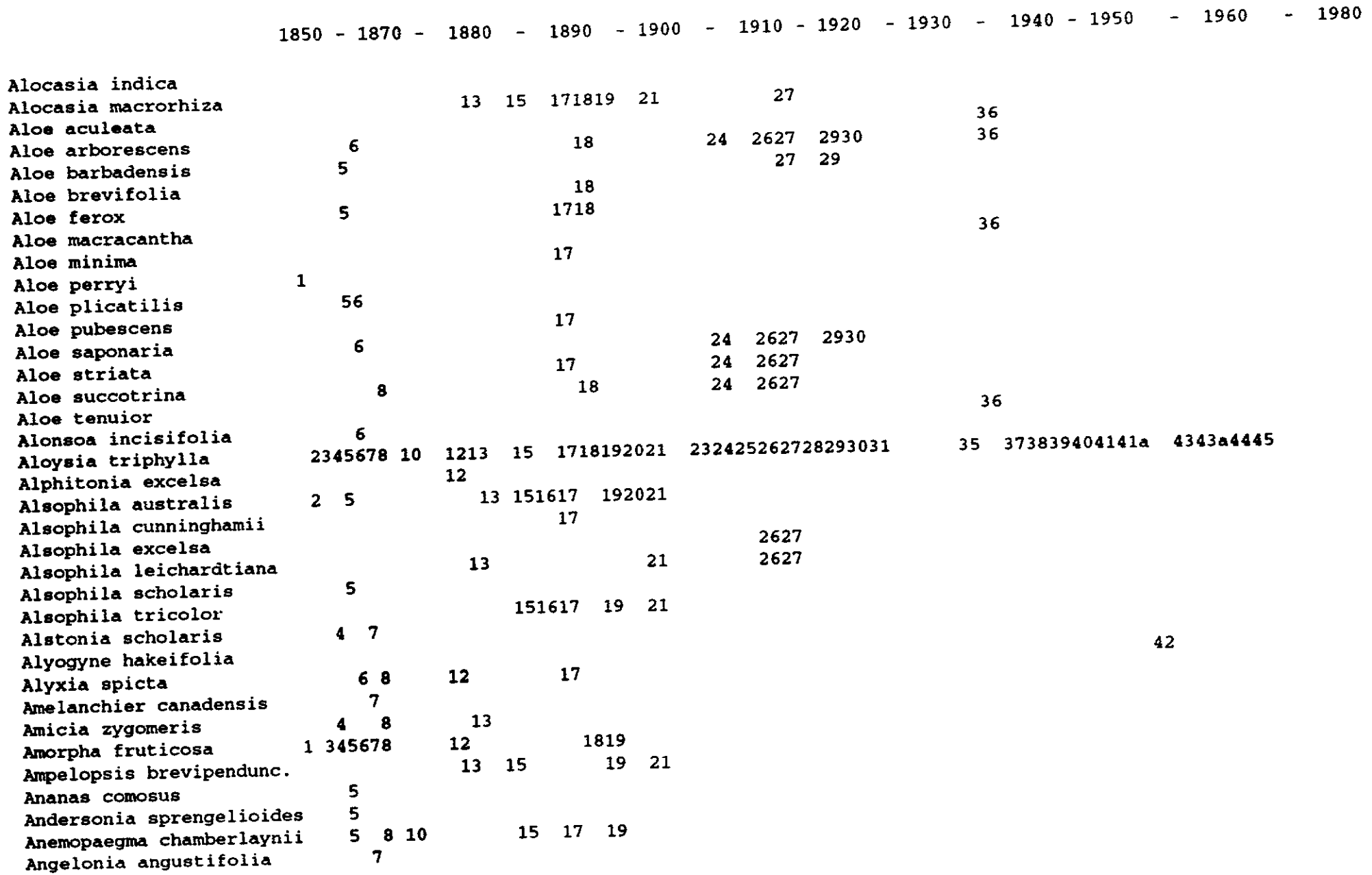
	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
+Laburnocytisus adamii	1718 41 43a
Abarema grandiflora	42 43a
Abarema sapindoides	17
Abelia chinensis	5 78 10111213 15 1718192021 2324 2627 29 353637 39404141a 4343a44 46
Abelia floribunda	45 25 36 4141a 4343a44 48
Abelia schumannii	
Abelia uniflora	8 10111213 15 1718192021 2324 28 36 44 4546 49
Abelia x grandifolia	
Abeliophyllum distichum	
Abelmoschus manihot	45 7 17
Abies alba	8 1112 15 17 1920 24 2627 2930 353637 3940 41 43
Abies amabilis	8 15 17 19
Abies balsamea	45 7 13 19
Abies cephalonica	4 78 12 15 17
Abies jezoensis	19
Abies nordmanniana	10 13 2627 2930 37
Abies pindrow	8 13 15
Abies pinsapo	7 23 26
Abies procera	7
Abies religiosa	7
Abies spectabilis	78 15 17 19 21
Abobra tenuifolia	25
Abrus precatorius	4 7
Abutilon bedfordianum	78 101112
Abutilon darwinii tessela.	15 171819 24 2627
Abutilon fraseri	4243
Abutilon golden fleece	18 2021 2324 2627282930 35 37 39 43
Abutilon hybridum	15 1718192021 2627282930 39 4141a 4343a
Abutilon megapotamicum	5 21 2324 2627282930 353637 39 4141a 43 44
Abutilon pictum	5 2324 2627282930 353637 39 4141a 4343a44 48
Abutilon sellovianum	1718 41a
Abutilon venosum	6 8
Abutilon vesuvius	24 2930 3637 39 4141a 4343a


1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Abutilon vitifolium
Abutilon XboutedeNiege
Acacia accola
Acacia acinacea
Acacia adunca
Acacia anceps
Acacia aneura
Acacia armata
Acacia baileyana
Acacia brachybotrya
Acacia brachystachya
Acacia buxifolia
Acacia calamifolia
Acacia cardiophylla
Acacia catechu
Acacia cheelii
Acacia conferta
Acacia cultriformis
Acacia cyanophylla
Acacia cyclops
Acacia dealbata
Acacia deanei
Acacia decipiens
Acacia decurrens
Acacia farnesiana
Acacia floribunda
Acacia gladiiformis
Acacia glaucescens
Acacia homalophyllus
Acacia implexa
Acacia iteaphylla
Acacia juniperina
Acacia kettlewelliae
Acacia leprosa
Acacia ligulata
Acacia linifolia

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Acacia longifolia	56 37 39 41 42 43a
Acacia longissima	5 14
Acacia mearnsii	5 14 24 2627 2930 32 42
Acacia melanoxylon	14 1718 21 42
Acacia montana	6
Acacia myrtifolia	56 14 41 43a
Acacia nigricans	5
Acacia nilotica	1 42
Acacia oswaldii	
Acacia oxycedrus	6
Acacia panniculata	4567 28
Acacia pendula	45 7 18 27 42 45
Acacia penninervis	6 39 42
Acacia podalyriifolia	262728293031 353637 39404141a424343a444546
Acacia pravissima	24
Acacia prominens	6 41 43a 46
Acacia pruinosa	39
Acacia pubescens	6 17 21 41
Acacia pycnantha	6 1819 24 2627282930 353637 39404141a4243
Acacia retinodes	6 24
Acacia riceana	6 46
Acacia rubida	4 6 37 39 41 42 43a 46
Acacia saligna	
Acacia sentis	6
Acacia spectabilis	6 27 2930 353637 394041 4243 46
Acacia spinescens	6
Acacia stricta	6
Acacia suaveolens	456 14
Acacia tenuifolia	6
Acacia terminalis	262728293031 353637 39404141a424343a444546
Acacia tetragonophylla	42
Acacia trinervata	14
Acacia undulifolia	6
Acacia verniciflua	6
Acacia vestita	6 8 42
Acacia victoriae	

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Acacia wattsiana	42
Acalypha hispida	39
Acalypha wilkesiana	13 16 18 2627 2930 353637 39404141a 4343a44 46
Acanthocereus pentagonus	8
Acanthopanax spinosum	13 15 1819
Acanthus spinosissimus	18
Acer argutum	39
Acer buergeranum	41a 43a
Acer campestre	6 20 353637 3940
Acer cappadocicum	35 37 39 44
Acer ginnala	36 43a
Acer japonicum	21 23 2627 2930 3637 394041 43 44 46
Acer negundo	34567 10 13 15 1718192021 2324 262728293031 353637 39404141a 4343a444546 49
Acer palmatum	24 2627282930 3637 39404141a 4343a44 46 4849
Acer platanoides	34 7 15 1718192021 24 2627282930 3637 3940 41a 4343a44
Acer pseudoplatanus	345 7 10 13 15 17 192021 2324 262728293031 353637 3940 41a 43 49
Acer rubrum	23 27 39
Acer saccharinum	345 7 10 2627 2930 353637 40
Ackama paniculata	42
Acmena smithii	45678 1415 1718192021 24 27 2930 353637 39404141a424343a44 48
Acokanthera oblongifolia	16 18 2627 29 31 35 37 40 41a 43a 4546
Acokanthera oppositifolia	161718 24 2627 46 49
Actinidia chinensis	
Adansonia digitata	4 7
Adenandra uniflora	4 67 18
Adenanthera pavonia	4
Aegle marmelos	12
Aeschynanthus boschianus	4 7
Aeschynanthus javanicus	6
Aeschynanthus longifolius	7
Aeschynanthus marmorata	4 7 16
Aeschynanthus parasiticus	4 7 16 36
Aeschynanthus pulcher	7
Aesculus californica	17
Aesculus hippocastanum	2345678 10 1213 15 171819 21 2324 2627 2930 2930 36 394041 43
Aesculus Xcarnea	3 2627 2930 37 3940 4343a

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Agapetes serpens	40 43a 45
Agastachys odorata	
Agathis australis	2 4 78 1213 15 17 19 21 33 40
Agathis moorei	8 10 1213 17
Agathis obtusa	17
Agathis ovata	8 12 15 17
Agathis robusta	8 1213 15 17 19 21
Agathosma capensis	37 39
Agathosma erecta	5
Agathosma pulchella	5
Agauria buxifolia	8
Agave americana	45678 15 181920 24 26272829 36 46
Agave angustifolia	46
Agave attenuata	26272829
Agave filifera	36
Agave picta	5
Agave seemanniana	28
Aglaonema commutatum	44
Aglaonema simplex	44
Agonis flexuosa	3637 39404141a424343a444546 49
Agonis juniperina	43
Ailanthus altissima	234567 10 13 15 171819 21 2324 26272829 35 37 39
Akebia quinata	24252627 293031 353637 39404141a 4343a44
Alberta magna	24
Albizia distachya	4567 12 24 27 28 35 37 39
Albizia julibrissin	13 26 37 39 44
Alectryon excelsus	12 24252627 42
Aleurites fordii	40
Aleurites moluccana	15 17 19
Allamanda cathartica	4 78 10 1213 161718 2021 23 2627 2930
Allamanda neriifolia	67 10 12 1617 2021 2324 262728293031
Allamanda violacea	13 161718
Allamanda Xchelsonii	18
Alnus cordata	
Alnus glutinosa	13 262728 35 37 39
Alnus incana	49


1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Alocasia indica
Alocasia macrorhiza
Aloe aculeata
Aloe arborescens
Aloe barbadensis
Aloe brevifolia
Aloe ferox
Aloe macracantha
Aloe minima
Aloe perryi
Aloe plicatilis
Aloe pubescens
Aloe saponaria
Aloe striata
Aloe succotrina
Aloe tenuior
Alonsoa incisifolia
Aloysia triphylla
Alphitonia excelsa
Alsophila australis
Alsophila cunninghamii
Alsophila excelsa
Alsophila leichardtiana
Alsophila scholaris
Alsophila tricolor
Alstonia scholaris
Alyogyne hakeifolia
Alyxia spicta
Amelanchier canadensis
Amicia zygomeris
Amorpha fruticosa
Ampelopsis brevipendunc.
Ananas comosus
Andersonia sprengelioides
Anemopaegma chamberlaynii
Angelonia angustifolia

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Angophora cordifolia	45 37 39 43 444546
Angophora costata	5 42
Angophora intermedia	
Angophora subvelutina	1415 19 27
Annona cherimola	2345 7 10 12 13 17181920 2324 27 293031 35 37 39 43
Annona glabra	345 7
Annona reticulata	2
Annona squamosa	5
Anthyllis barba-jovis	4
Antigonon leptopus	171819 21 2324 2627 293031 3536373839404142 4343a44 48
Aotus ericoides	56 14
Aotus gracillima	6
Aphanopetalum resinosum	25
Aphelandra aurantiaca	5 13 1617 27 2930
Aphelandra liboniana	13 44
Aphelandra squarrosa	1617
Aphelandra tetragona	5 78 1617
Aprocactus flagelliformis	4 678 15 171819 24
Aralia spinosa	17
Araucaria angustifolia	45 78 12 15 17 21 27
Araucaria araucana	3 56 8 10 1213 15 17 19 21 24252627 2930 35 37 3940
Araucaria bidwillii	45678 10 1213 15 17 192021 2324 262728293031 353637 394041 4343a
Araucaria columnaris	5678 10 1213 15 17 192021 23 26 37
Araucaria cunninghamii	345 78 10 1213 15 17 192021 24 2627 2930 353637 3940 41a424343a44
Araucaria heterophylla	1 345678 10 1213 15 17 192021 232425262728293031 3536373839 4141a424343a444546 48
Araucaria rulei	12 1213 15 17
Araujia sericifera	21 2627 29
Arbutus andrachne	45 78 10 1213 15 171819
Arbutus canariensis	5 8 10 1718192021 24 2627 29
Arbutus unedo	2345 78 10 1213 15 171819 21 232425262728293031 35363738 404141a 4343a44 46 4849
Archontophoenix alexandr.	12 16 20
Archontophoenix cunningh.	34 7 10 1213 1617 20 24 2627 31 34353637383940
Ardisia crenata	23 678 10 1213 1516 18192021 2324 262728293031 353637 39404141a424343a44
Ardisia crispa	8 15 19 46
Ardisia solanacea	2
Arduiana grandiflora	2324 2627282930 35 373839 43

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Arecastrum romanzoffianum	13 1617 24 2627 31 34353637 3940 4343a44
Aristolochia durior	5 27
Aristolochia elegans	21 232425262728293031 353637 3940 424343a44 48
Aristolochia grandiflora	171819 21 23 2627
Aristolochia indica	12
Aristolochia labiosa	5 17
Aristolochia sempervirens	4 78
Aristotelia racemosa	25
Aronia arbutifolia	36 40 43a44
Aronia prunifolia	40
Artabotrys hexapetalus	7
Artemisia abrotanum	1 34567 13 17 38
Artemisia absinthium	1314
Artemisia lactiflora	41
Artemisia stellerana	36
Artocarpus cannanii	13 16
Artocarpus heterophyllus	2 1213 1617
Arundinaria khaysiana	18
Arundinaria variegata	13 17 23 2627 29 35 37 39
Arundinaria viridistriata	36 41 43a
Arundo donax	6 10 13 1718 24 2627282930 353637
Asarina barclaiana	45678 131415 1718192021 23 252627 2930
Asarina erubescens	45678 1415 17181920 2425
Asclepias curassavica	678
Asclepias exaltata	6
Asclepias fruticosa	7 40
Asclepias rubra	
Asimina triloba	45 7
Aspalathus sarcodes	26
Asparagus asparagoides	7 14 2021 2425262728293031 32 36 4041 43a
Asparagus crispus	2627 2930
Asparagus densiflorus	2021 23 252627 29 31 34 37 3940 4546 48
Asparagus officinalis	1 8 1314151617 192021 2324 2930 3233 35 37 3940 4849
Asparagus setaceus	1718 2021 23 252627 293031 35 37 39
Asparagus virgatus	1718 2021 23
Aspidistra elatior	13 21 49

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Aster petiolata	36 41 43a
Aster rotundifolius	36
Asterolasia asteriscophora	6
Astroloma humifusum	56
Astroloma pinifolium	14
Astrotricha floccosa	5 14 28
Asystasia chelonioides	13 24
Asystasia scandens	78 10 13 42 43a
Atalaya hemiglauca	
Atherosperma moschatum	7
Athrotaxis cupressoides	5
Athrotaxis laxifolia	5
Athyrium filix femina	13
Atriplex cinerea	6
Atriplex halimus	21 27
Atriplex leptocarpa	27
Atriplex nummularia	21 27 42
Atriplex semibaccata	21 27
Aucuba japonica	2345678 10 1213 15 1718192021 23 252627 293031 3536373839404141a 43a444546 49
Aulax pinifolia	45
Austrocedrus chilensis	8 10 12 15 17 19
Austromyrtus tenuifolia	12 41 4546
Azara microphylla	43a
Backhousia anisata	36 404141a 43a
Backhousia citriodora	
Backhousia myrtifolia	8 13 17
Baeckea camphorosmae	5
Baeckea linifolia	25 46 49
Baeckea virgata	
Baloghia lucida	5678 15 171819 21
Bambusa argentea	21
Bambusa arundinacea	34567 13 15 1718192021 23 2627132930 353637 39
Bambusa glaucescens	36
Bambusa gracilis	24 30 40
Bambusa vulgaris	15 17 21 24252627 29
Banksia coccinea	44

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Banksia collina	6
Banksia dryandroides	5
Banksia ericifolia	5 14 25 43a 46 4445
Banksia grandis	46
Banksia integrifolia	56
Banksia littoralis	5
Banksia marginata	56 14 25
Banksia paludosa	5
Banksia robur	5 14
Banksia serrata	56
Banksia spinulosa	56
Barklya syringifolia	10 1213 15 17181920 24 41 42 43a44
Barleria cristata	2829 39 43
Barleria strigosa	7
Bauera rubioides	2 45 7 14 404141a 43a444546
Bauhinia aculeata	12
Bauhinia hookeri	12 15 36 39 4141a 4343a 4546
Bauhinia punctata	8 12 15 1718192021 2324 262728293031 353637 39404141a42 43a4445 48
Bauhinia purpurea	345 7
Bauhinia racemosa	345 78 10 12 15 171819 2324 2627 36 39404141a 43a4445
Bauhinia scandens	4 7
Bauhinia tomentosa	13 1718192021 24 2627 2930 353637 39404141a 43a 46
Bauhinia variegata	7 36
Beaucarnea recurvata	5 4546
Beaufortia decussata	34 78 1213 1718 2324 2627 293031 353637
Beaufortia sparsa	6 4141a 43a
Beaumontia grandifolia	17 46
Bedfordia salicina	2627 2930 36 404141a 43a44
Begonia beatrice roseby	45 7
Begonia coccinea	16
Begonia corallina	678 1617 24 2627 2930 40
Begonia dipetala	28
Begonia fagifolia	5 16
Begonia foliosa	
Begonia gracilis	
Begonia grandis	

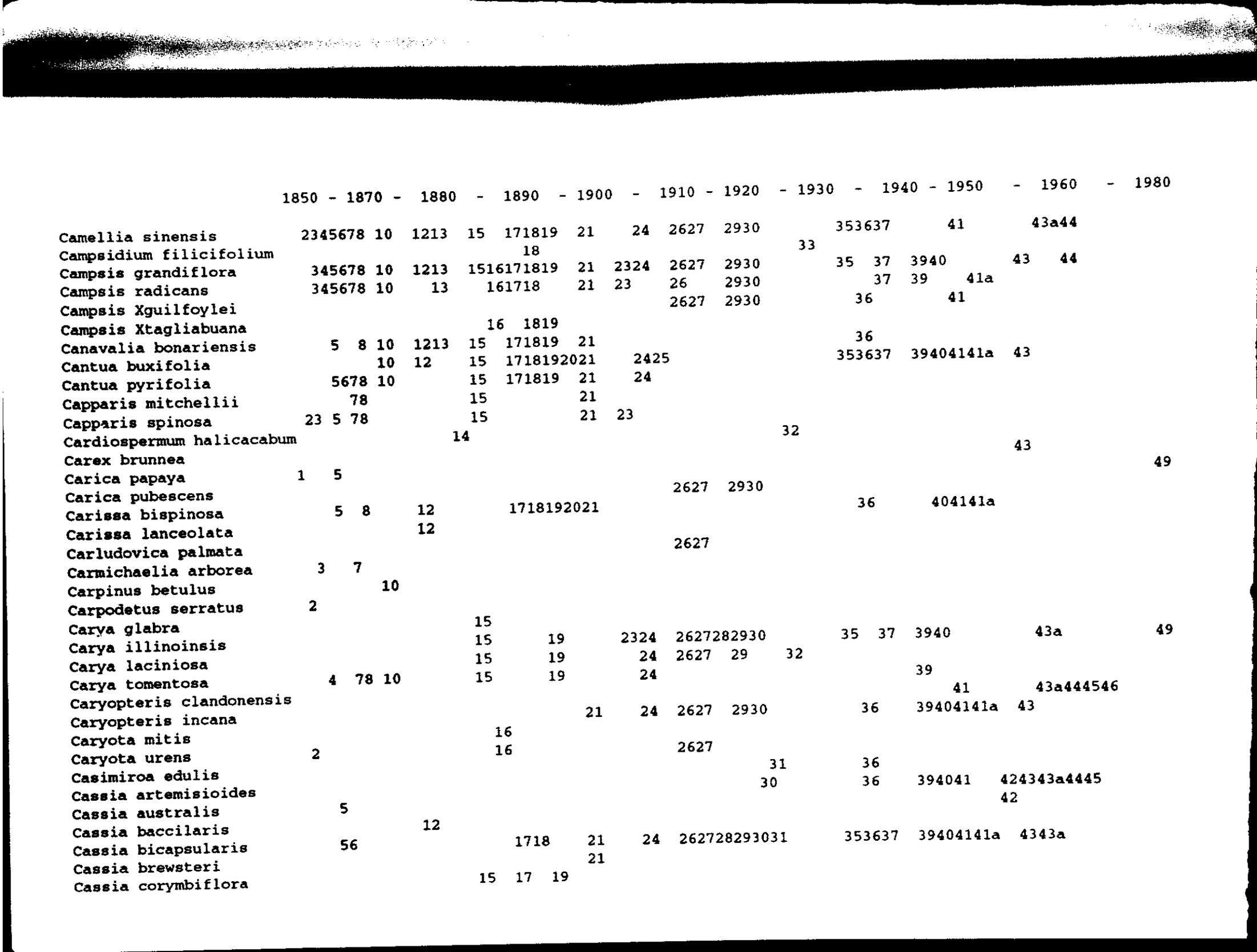
	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Begonia maculata	45678 16 2627 2930
Begonia metallica	16 24 2627 2930 36 4041
Begonia odorata	4 78 16 19
Begonia reniformis	45 7 16
Begonia sanguinea	45 78 17
Begonia stipulacea	45 7 1617
Begonia strigillosa	16
Begonia suffruticosa	5
Begonia undulatum	16 38 40
Begonia Xcredneri	36
Begonia Xingramii	36
Begonia Xprestoniensis	16
Begonia Xsemperflorens-cu.	45 78
Begonia Xweltoniensis	1617 24 2627 2930
Beloperone oblongata	13
Berberis aggregata	36 4041
Berberis buxifolia	2627
Berberis canadensis	10 20 24
Berberis darwinii	78 10 15 1718192021 232425 27282930 353637 394041 4343a444546
Berberis dulcis	4 7 10 12 17
Berberis hookeri	4 78 10 1819
Berberis sargentiana	40
Berberis thunbergii	3637 39404141a 4343a444546 48
Berberis vulgaris	34567 10 15 1718192021 2324252627282930 32 3435 37 39 41
Berberis wilsoniae	3637 394041 43
Berberis Xcarminea	41
Berberis Xstenophylla	36
Betula papyrifera	37 41a
Betula pendula	5 13 15 17 19 21 2627 39 353637 39404141a 4343a444546 49
Bignonia argyrea	13 15 19
Billardiera cymosa	6
Billardiera longifolia	6
Billardiera scandens	56
Bixa orellana	4
Boehmeria argentea	13
Boehmeria nivea	13

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Bombax ceiba	5
Borbonia cordata	6
Boronia anemonifolia	7
Boronia denticulata	18 43a 44 48
Boronia heterophylla	
Boronia ledifolia	5 7 1415 28
Boronia megastigma	15 1718192021 2425262728293031 36 404141a 43a44 48
Boronia microphylla	7
Boronia pinnata	5 7 1415 19 25 28
Boronia serrulata	5 7 1415 171819 21 28
Boronia spathulata	17
Bosea amherstiana	26 282930 44
Bossiaea buxifolia	6
Bossiaea heterophylla	5 14 28
Bossiaea obcordata	5
Bossiaea scolopendria	5 14 28
Bougainvillea glabra	1213 15 1718192021 2324 2627 293031 34353637 39404141a 4343a 4546
Bougainvillea refulgens	21
Bougainvillea spectabilis	345678 10 1213 15 1718192021 2324 2627 293031 3536373839404141a 4343a44454647
Bougainvillea Xbuttiana	36 404141a 4546
Bouvardia leiantha	171819
Bouvardia longifolia	1516171819
Bouvardia sanglorraine	171819
Bouvardia ternifolia	45 7 13 1516171819 30 39
Bouvardia victor lemone	171819
Bouvardia Xalfred neuner	18
Bouvardia Xbridal wreath	16 18
Bouvardia Xbrillant	13 16 18
Bouvardia Xcandidissima	1516171819
Bouvardia Xdavonsii	151617 19
Bouvardia Xdazzler	18
Bouvardia Xelegans	1718
Bouvardia Xflavescens	18
Bouvardia Xhogarth	1718
Bouvardia Xjasminoides	15
Bouvardia Xmaidensblush	16 18

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Bouvardia Xpresident gar.	1718
Bowenia spectabilis	16
Brachychiton acerifolius	45678 10 1213 15 1718192021 2324 262728293031 3536373839404141a424343a444546
Brachychiton bidwillii	42
Brachychiton discolor	18 39 4141a4243
Brachychiton diversifolium	56 1213 18 21 2324 26272829303132 353637 39 41 4343a44
Brachychiton populneus	2 45 78 10 1415 17 19 21 24 2627 40 42
Brachychiton rupestris	4 7 10
Brachychiton Xhybridus	3536373839 43a
Brachysema lanceolatum	36 3839404141a 43 444546 4849
Brachysema sericeum	49
Brassaia actinophylla	1213 171819 21 2324 2627 2930 35 37 404141a 4343a444546
Brexia madagascariensis	15 1819
Brexia spinosa	13
Breynia disticha	13 16 18 232425262728293031 33 35 373839 43 444546
Broussonetia papyrifera	56 13 17 2627 29 39
Browallia speciosa	17
Brugmansia arborea	45678 10 13 15 171819 21 232425262728293031 3536373839404141a 4343a
Brugmansia sanguinea	567 10 13 15 1718 36
Brugmansia suaveolens	3 5 78 10 13 15 1819 24 26
Brunfelsia acuminata	45 78 1213 16
Brunfelsia americana	12 1516 1819 21 24 2627 293031 353637 39 41
Brunfelsia australis	2627
Brunfelsia calycina	1516 1819 21 36
Brunfelsia hydrangeiformis	45 7 36 404141a
Brunfelsia latifolia	45 78 10 13 151617 19 21 24 2627 293031 36 404141a 4343a44
Brunfelsia pauciflora	78 1213 1516 18192021 2627 293031
Brunfelsia undulata	5
Brunfelsia uniflora	45 78 10 1213 1516171819 23 35 37
Buddleia alternifolia	40
Buddleia colvilei	3940 44
Buddleia crispa	3456 8 13 15 171819 21 24 2627 262728293031 353637 39404141a 4343a444546
Buddleia davidii	
Buddleia globosa	45678 10 15 171819 21 24 2627 29 35 37 39 43 44
Buddleia lindleyana	45678 10 15 17 19 21 29
Buddleia madagascariensis	4 678

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Buddleia salvifolia	345678 4041 43a4445
Burchellia bubalina	345678 10 1213 15 171819 21 4343a
Bursaria spinosa	56 14
Butia capitata	2 2627 36 40 43a
Butia yatay	41 43a 45
Buxus balearica	46
Buxus microphylla	
Buxus sempervirens	2345678 10 1213 15 1718192021 24 262728293031 3536373839404141a 4343a444546 48
Caesalpinia alternifolia	15 36 404141a 43a 48
Caesalpinia coriaria	34
Caesalpinia ferrea	43a
Caesalpinia gilliesii	6 8 1213 18 21 23 27282930 32 35 3738 43 44
Caesalpinia pulcherrima	5 13 19 27
Caesalpinia sepiaria	5
Caesalpinia spinosa	15 17 19
Caesalpinia tara	17
Calceolaria bicolor	45 8 13 17
Calceolaria integrifolia	5
Calceolaria rugosum	5 8 14 1617 23 28 32
Calliandra haematocephala	15
Calliandra portoricensis	15 1819 21 27 2930 43a
Calliandra tweedii	12 15 171819 21 24 2627 293031 3536373839404141a 4343a44
Callicarpa bodinieri	39 4343a
Callicarpa cana	12 23 40
Callicarpa dichotoma	41 47
Callicoma serratifolia	5 10 1415 19
Callistemon acuminatus	36 39404141a 4343a44
Callistemon brachyandrus	6 42
Callistemon citrinus	5 14 24 262728293031 353637 39404141a4243a444546 49
Callistemon linearifolium	5 14
Callistemon linearis	36 42
Callistemon macropunctatus	6 26 363738 41 42 43a44
Callistemon phoeniceus	39 42
Callistemon pinifolius	18
Callistemon rigidus	56 14 42
Callistemon salignus	67 14 36 404141a42 43a 49

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Callistemon shiressii	43
Callistemon speciosus	7 40 41a42 46 49
Callistemon viminalis	49
Callistemon Xkingsparksp.	
Callitris columellaris	5 36 4141a42 43a 46
Callitris endlicheri	4 67 15 17 19 36 41 42 43a
Callitris gunnii	45 7
Callitris huegelii	12
Callitris macleayana	6 8 10 12 15 17 19
Callitris muelleri	36 3940 42
Callitris oblonga	42
Callitris preissii	56 3637 39 42
Callitris rhomboidea	45 7 13 15 17 19 3637383940 41a424343a44
Calluna vulgaris	36
Calocasia esculenta	18
Calocedrus decurrens	17 21 24 2627 36 40 46
Calocephalus brownii	6
Calodendrum capense	2 15 21 24 262728293031 353637383940414 1a424343a444546 48
Calonyction aculeatum	25
Calophyllum inophyllum	5
Calothamnus gracilis	5
Calothamnus homalophyllus	
Calothamnus quadrifidus	6
Calothamnus villosus	35 37
Calycanthus floridus	345 78 10 13 21 2324 2627 29 37 39
Calycanthus occidentalis	13
Calycotome spinosa	7
Calystegia hederacea	5
Calystegia marginata	5
Calystegia sepium	5
Calytrix tetragona	56 14
Camellia japonica	2345678 10 1213 19 21 3637 404141a 4445 4849
Camellia maliflora	3 7
Camellia oleifera	3
Camellia reticulata	3 7 3637 39404141a 4445 4849
Camellia sasanqua	3 5 78 19


1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Camellia sinensis
Campsidium filicifolium
Campsis grandiflora
Campsis radicans
Campsis Xguilfoylei
Campsis Xtagliabuana
Canavalia bonariensis
Cantua buxifolia
Cantua pyrifolia
Capparis mitchellii
Capparis spinosa
Cardiospermum halicacabum
Carex brunnea
Carica papaya
Carica pubescens
Carissa bispinosa
Carissa lanceolata
Carludovica palmata
Carmichaelia arborea
Carpinus betulus
Carpodetus serratus
Carya glabra
Carya illinoinsis
Carya laciniosa
Carya tomentosa
Caryopteris clandonensis
Caryopteris incana
Caryota mitis
Caryota urens
Casimiroa edulis
Cassia artemisioides
Cassia australis
Cassia baccilaris
Cassia bicapsularis
Cassia brewsteri
Cassia corymbiflora

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Cassia corymbosa	6
Cassia didymobotrya	353637 4041 4343a
Cassia eremophila	6 42 43a
Cassia fistula	5 21 43
Cassia floribunda	25
Cassia glandulosa	6
Cassia grandis	43
Cassia laevigata	42
Cassia marilandica	2627
Cassia planiticola	5 8
Cassia roxburghii	12
Cassia surattensis	8 12
Cassia tomentosa	5
Cassia tora	8
Cassine australis	2 42
Cassinia aureonitens	14
Castanea crenata	16 2324 2627282930 33 35 37 39
Castanea sativa	12345 78 10 1213 161718 2324 262728293031 35 37 39 49
Castanopsis cuspidata	1819
Castanospermum australe	3 567 10 1213 15 1718192021 2324 262728293031 353637383940414 1a424343a44
Casuarina cristata	41 42
Casuarina cunninghamiana	32 36 39 41 424343a4445
Casuarina distyla	6 42
Casuarina equisetifolia	6 46
Casuarina glauca	32 36 39 41 424343a 4546 49
Casuarina littoralis	6 42 46 49
Casuarina nana	39 46
Casuarina paludosa	5
Casuarina stricta	56 1415 17 19 25 27 35 37 42 44
Casuarina torulosa	5 1415 19 2728 42 46
Catalpa bignonioides	3 5678 10 1213 15 171819 21 2324 2627282930 35 37 4141a 43a44 49
Catalpa bungei	27 2930
Catalpa ovata	17 27 2930
Catalpa speciosa	24 2627 2930 36 40 43
Cavendishia acuminata	7
Ceanothus americanus	17 24 45

	1850 - 1870 -	1880 -	1890 -	1900 -	1910 -	1920 -	1930 -	1940 -	1950 -	1960 -	1980
Ceanothus coeruleus				21				37			
Ceanothus dentatus			18	21							
Ceanothus leucodermis	5 78 10		18		24	2930		37			
Ceanothus rigidus	10										
Ceanothus thyrsiflorus	10		17								
Ceanothus Xdelilianus	5							39		45 47	
Ceanothus Xedwardsii								37	3940 41a	4343a44	
Ceanothus Xpallidus	5										
Cedrela sinensis									41	43a	49
Cedrela toona	2 5 10				24	2627 2930		353637		43a	
Cedronella canariensis	1 56	13									
Cedrus atlantica		1213	15 17	1920	2425	2728293031		353637	39404141a	4343a44	
Cedrus deodara	234 78 10	1213	15 17	192021	232425262728293031		33	36373839404141a		4343a444546	49
Cedrus libani	34 78 10	13			25	272829			41		
Ceiba pentandra	5										
Celtis australis	3 567					2627 29		3637	39404141a	4343a44	
Celtis laevigata									41	43a	
Celtis occidentalis	3 5 7 10								41	43a	
Centaurea aggregata										44	
Cephalocereus collinsii								36			
Cephalocereus lanuginosus			17								
Cephalotaxus drupacea	10	15	17 19							46	
Cephalotaxus fortunii	8 10	13 15	17 19	21						44	
Cephalotaxus harringtonia								36	4041	43a	
Cerastium tomentosum											
Ceratonia siliqua	3 567 10	1213 15	171819	21	2324	262728293031		36	383940414141a	424343a44	
Ceratopetalum apetalum	56 8 10		18	21	24					424343a	
Ceratopetalum gummiferum	5 8 10	1415	171819	2021	2324	262728293031		353637	39404141a	424343a444546	4849
Ceratostigma griffithii									39	43 44	
Ceratostigma plumbaginoid.	5678 10	15	171819	21	24	2627		353637	39 41	4343a	
Ceratostigma willmottianum								363738394041	41a	43a44	
Cercis canadensis	6					2627 2930		36	39 41	43a	
Cercis siliquastrum	23 5678 10	1213 15	1819	21	2425262728293031			353637383940	41a	4343a44	
Cereus hexagonus	7							36			
Cereus peruvianus											
Cereus triqueter	7										

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Cereus variabilis	7 17
Ceropegia elegans	5 8 13
Ceropegia stapeliiformis	5 13 17
Cestrum aurantiacum	5 78 10 1213 15 1718192021 2324 2627 29 35 37 39 43
Cestrum diurnum	10 1213 15 1718192021 2324 26272829 35 37 39
Cestrum elegans	45678 10 13 15 1718192021 2324252627 293031 3536373839404141a 4343a44
Cestrum endlicheri	5
Cestrum fasiculatum	45678 15 171819 21
Cestrum newellii	1819 23 29
Cestrum nocturnum	10 12 15 1718192021 2324 2627282930 353637 39404141a 4343a4445 48
Cestrum scaber	1819
Chaenomeles japonica	2345678 10 1213 1516171819 21 2324 26272829 31 353637 41a 43
Chaenomeles speciosa	17 23 2627282930 353637 39 41 43a 46
Chaenomeles Xsuperba	36 41 43a
Chamaecyparis funebris	8 1213 15 17 19 2324 2627 2930 35 37 39 43
Chamaecyparis lawsoniana	8 10 12131415 17 19 21 232425262728293031 32 35 37 3940 41a 4343a4445 4849
Chamaecyparis nootkatensis	8 10 12 15 1718192021 2627 4343a44 49
Chamaecyparis obtusa	10 1213 15 171819 21 2324 262728293031 353637 39404141a 4343a44 49
Chamaecyparis pisifera	10 1213 15 1718192021 2324252627282930 33 35 37 39404141a 4343a44 49
Chamaecyparis thyoides	8 13 17 19 39
Chamaecytisus proliferus	26 28
Chamaedaphne calyculata	15
Chamaedorea elegans	26 44
Chamaedorea graminifolia	27
Chamaerops humilis	78 13 1617 24 2627 31 34353637 39
Chamelaucium uncinatum	3031 3536373839404141a 4343a444546 48
Cheiranthus cheiri	5
Chilianthus oleraceus	45678 15 1819
Chimonanthus praecox	23 5 7 10 13 15 171819 21 24 2627 29 353637 394041 4343a44
Chimonobambusa falcata	18 21 24252627 29 35 37 39 43 43a
Chionanthus retusus	
Chionanthus virginicus	3 7 2627 37 39 43
Chironia baccifera	12
Chironia floribunda	17
Choisya ternata	1718 2021 232425262728293031 3536373839404141a 4343a444546 48
Chorizema cordatum	6 10 15 171819 21 24 262728 31 353637 3940 41a 43

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Chorizema ilicifolium	28 36 38 41 42 43a444546
Chorizema varium	6 18
Chrysalidocarpus lutescens	27
Chrysanthemum frutescens	17 24 26 2930 40
Chrysophyllum cainito	2 7
Cibotium schiedei	27
Cinnamomum camphora	12345678 10 1213 15 1718192021 2425262728293031 3536373839404141a 4343a44 46
Cinnamomum zeylandicum	7 12 15 171819
Cissus antarctica	5 8 13 36 4546
Cissus discolor	8 10 13 161718 2021 2627 2930
Cissus rhombifolia	44
Cissus striata	21 24 26
Cissus Xglaucus	6
Cistus albidus	56 19 2627
Cistus crispus	2627 29 36 39404141a 4343a
Cistus ladanifer	5 10 18 36
Cistus laurifolius	2627
Cistus monspeliensis	7 15 19
Cistus psilosepalus	67
Cistus salviifolius	10
Cistus Xglauca	5 44
Cistus Xnigrescens	
Cistus Xpulverulentus	
Cistus Xpurpureus	6 10 2627
Citharexylum fruticosum	24 26272829 36 41 43a
Citharexylum quadrangulare	15 1819 21 35 37 3940 41a 43
Citharexylum spinosum	4546
Citriobatus multiflorus	5
Citrus aurantiifolia	12345678 1213 161718 2324 2627282930 35 37383940 44 46 49
Citrus aurantium	12 4 78 1213 2627 2930 40 4849
Citrus limon	12345 78 1213 161718 20 2324 2627 293031 33 35 373839 444546 48
Citrus maxima	12 4 78 1213 161718 20 2324 2627282930 35 37383940 43 49
Citrus medica	12 45 78 1213 16 18 20 2324 2627282930 38 40 49
Citrus reticulata	2 4 78 1213 161718 20 2324 2627282930 33 35 37383940 444546 49
Citrus sinensis	12345 78 1213 161718 20 2324 2627282930 33 35 37383940 444546 4849
Citrus Xnobilis	2

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Citrus Xparadisi	2627282930 35 37383940 444546 4849
Cladrastis lutea	24 2627
Clausena lansium	7 16
Clematis aristata	5 14 17 28 36 41 43a
Clematis buchananiana	19
Clematis campaniflora	3 5 7 10
Clematis flammula	3 5 7 12 25
Clematis florida	3 5 7 10 12 15 18
Clematis heracleifolia	78 10
Clematis lanuginosa	10 12 15
Clematis microphylla	6 15
Clematis montana	5 7 10 21 353637 394041 43a444546
Clematis recta	6
Clematis reticulata	10
Clematis virginiana	5 78 10
Clematis viticella	3 5 10 1718
Clematis XDuchess of Edin	2627
Clematis Xjackmanii	1819 21 2627 2930
Clematis Xpatens	12 15 1819 37
Clerodendron floribunda	43
Clerodendron glabrum	13
Clerodendron kaempferi	6
Clerodendron nutans	8 13 16 18
Clerodendron philippinum	8 13 15 1718 40
Clerodendron speciosissimum	8 10 13 18
Clerodendron splendens	78 17
Clerodendron thomsoniae	13 161718 2021 23 2627 2930 35 37 39 43 44
Clerodendron tomentosum	56
Clerodendron trichotomum	26
Clerodendron ugandense	36 404141a 43a
Clethra alnifolia	2627 2930 36 44
Clethra arborea	17 232425262728293031 353637 39404141a 4343a4445
Clianthus puniceus	5 15 1718192021 232425262728293031 35363738394041
Clitoria ternatea	2 5 10 17 40 41a 43a
Cloanthes stoechadis	18
Clytostoma callistegioides	56 8 10 1213 15 1718192021 2324 2627 293031 353637 39404141a 4343a444546

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Cobaea scandens	345678 1415 1718192021 232425262728293031 353637383940 41a 43 48
Cochlospermum religiosum	5
Cocos nucifera	2 5 17
Codiaeum variegatum	5 13
Coffea arabica	5678 1213 15 1718192021 2324 2627282930
Coleonema album	4567 10 44
Coleonema compacta	45
Coleonema pulchrum	394041 4343a444546 48
Colletia cruciata	8 10 1718
Columnea scandens	5 78 13 1617
Columnea schiedeana	5678 13 1617
Colutea arborescens	1 3 67
Colutea orientalis	6
Combretum coccineum	5 7 28 36
Combretum loefflingii	41
Comesperma ericinum	5 14
Comesperma volubile	56 14
Commelina coelestis	32
Commelina cyanea	5
Conospermum ericaefolium	5 14
Conospermum longifolium	5 28
Conospermum taxifolium	5
Convolvulus cneorum	36 41 43a
Convolvulus mauritanicus	15 17 2627 29 353637 394041 43a44
Coprosma lucida	5 13 24 262728293031 3435 37 3940 41a 43 48
Coprosma quadrifida	6
Coprosma repens	13 1718192021 2324 262728293031 353637 39404141a 4343a444546 49
Coprosma robusta	18
Coprosma Xkirkii	46
Cordyline australis	34567 10 14 1718 20 24252627 2930 38 40 43a444546
Cordyline banksii	20 4546
Cordyline gloriosa	16 18 2021
Cordyline indivisa	1213 17 23
Cordyline mooreana	17
Cordyline stricta	6 1314 1718 2021 24 2627 29 353637
Cordyline terminalis	6 8 1213 161718 2021 2627 2930 44

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Cornus amomum	36 38
Cornus canadensis	36 404141a
Cornus capitata	2 15 19 21 2627 2930 33 353637383940 4141a 4343a44
Cornus florida	36 4041 43a444546
Cornus kousa	36
Cornus sericea	45
Coronilla emerus	13 21
Coronilla juncea	7
Coronilla valentina	78 13 15 171819 21 23 26272829
Correa alba	46
Correa lawrenciana	56 45
Correa pulchella	6
Correa reflexa	6
Correa speciosa	56 14 28
Cortaderia selloana	5 5 10 12131415 17181920 2324 2627 293031 3637 3940 43 4546
Corylopsis spicata	12
Corylus avellana	12345678 10 1213 161718 2324 26272829 35 37 3940 48
Corylus maxima	35 37 39
Corynocarpus laevigata	3 5678 10 1213 15 171819 21 23242526272829 35 37 3940 43 45
Corynostylus hybanthus	161718
Corypha umbraculifera	2 17
Cotinus coggygria	345 7 10 13 17 24 2627 2930 37 394041 444546 48
Cotoneaster affinis	13 20
Cotoneaster buxifolius	13 17 21 24 2627 2930 39 43
Cotoneaster conspicuus	43a 45 49
Cotoneaster dammeri	4546
Cotoneaster dielsianus	36 39
Cotoneaster divaricatus	36 39 43
Cotoneaster franchetii	3637 39404141a 4343a444546 48
Cotoneaster frigidus	6
Cotoneaster glaucophyllus	39404141a 43a4445 48
Cotoneaster henryanus	43a
Cotoneaster horizontalis	39404141a 4343a444546 49
Cotoneaster lacteus	4141a 4343a444546
Cotoneaster microphyllus	6 8 13 15 17 24 2627 2930 3940 4343a44
Cotoneaster pannosus	3637 39404141a 4343a4445 48

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Cotoneaster rotundifolius	39 41
Cotoneaster rugosus	40
Cotoneaster salicifolius	45 49
Cotoneaster simonsii	18 2425262728293031 35 37 3940 43
Cotyledon barbeyi	36
Cotyledon macrantha	36
Cotyledon orbiculata	567 36
Crassula arborescens	36
Crassula arbtiflia	7
Crassula argentea	36
Crassula ciliata	45 7
Crassula ericoides	36
Crassula lactea	36
Crassula multicava	36 43a
Crassula rupestris	36
Crassula tetragona	36
Crataegus arkansana	36
Crataegus arnoldiana	36
Crataegus azarolus	78 13 27 36
Crataegus crus-galli	27 2930 36 41
Crataegus laevigata	345 78 1213 15 1718192021 2324 262728293031 35 37 39 43 444546
Crataegus mexicana	36 40 43a4445 48
Crataegus phaenopyrum	36 4041 4343a44 46 48
Crataegus smithiana	43a 48
Crataegus Spathulata	35
Crataegus succulenta	15 19 43a
Crataegus Xgrignonensis	
Crataegus Xlavallei	27 30 3536 394041 43a 48
Crotalaria capensis	6
Crotalaria laburnifolia	1 31 3536373839404141a 44
Crotalaria semperflorens	41
Crowea saligna	5 7 14 28
Cryptocarya glaucescens	5 17 37
Cryptomeria japonica	45678 10 1213 15 17 192021 232425262728293031 3536373839404141a 4343a 4546 49
Cryptostegia grandiflora	5 8
Cryptostegia madagascariensis	6

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Ctenitis decomposita	5 13 15 17 19 21
Cunninghamia lanceolata	45 78 10 12 15 17 19 21 35 37
Cunonia capensis	4546
Cuphea Cyanea	5 15
Cuphea hookerana	2627 29
Cuphea hyssopifolia	46
Cuphea ignea	45678 10 13 15 1718192021 2324 2627282930 32 3536373839404141a 4343a44
Cuphea jorullensis	7 13 15 1718192021 262728293031 353637 39 41 4343a
Cuphea lanceolata	5
Cuphea micropetala	10 45
Cuphea procumbens	5
Cuphea Xpurpurea	5 8 10
Cupressus arizonica	3536373839404141a424343a4445 48
Cupressus cashmeriana	8 12 15
Cupressus gaudalupensis	2627
Cupressus glabra	46
Cupressus goveniana	10 1213 15 17 1920 24 2627 29 35 37 39 42
Cupressus lusitanica	45 78 10 1213 15 17 19 21 24 262728293031 42 43a
Cupressus macnabiana	10 1213 2627
Cupressus macrocarpa	78 10 12 15 1718192021 232425262728293031 333435363738394041a424343a444546 4849
Cupressus sempervirens	345678 10 12131415 17 192021 232425262728293031 3536373839404i41a424343a444546 49
Cupressus torulosa	45678 10 1213 15 17 19 21 232425262728293031 343536373839404141a 4343a444546 4849
Cussonia spicata	46
Cussonia thyrsiflora	34 7
Cyathea excelsa	1516 19
Cycas circinalis	2 5 17 19 24 2627
Cycas media	12 1617
Cycas revoluta	56 10 1213 161718 20 24252627 31 34353637 39
Cyclopia genistioides	4
Cydonia chinensis	5
Cydonia oblonga	12 456 10 1213 161718 20 2324 2627 2930 35 3738 40 444546 4849
Cyperus alternifolius	13 17 23 26 293031 45
Cyperus papyrus	18 26 2930 4546
Cyphomandra betacea	24 262728293031 33 353637 39 41a 43
Cytisus albus	6 8 1213 151617 1920 24 2627 29 33
Cytisus austriacus	7 19

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Cytisus canariensis	4 678 24 2627 29 3637 39404141a 43 48
Cytisus fragrans	
Cytisus hirsutus	7
Cytisus linifolius	7
Cytisus multiflorus	2 5 2627 293031
Cytisus nigricans	45 7 2627
Cytisus purpurea	34 7
Cytisus racemosus	45 7
Cytisus scoparius	1 5 24252627 30 353637 39404141a 44
Cytisus spachianus	67 3637 394041 43a
Cytisus stenopetalus	39404141a 44
Cytisus Xburkwoodii	41
Cytisus Xdallimorei	3637 39404141a 44
Cytisus Xlilactime	37 39
Cytisus Xpraecox	46
Daboecia cantabrica	7 17 19 21 45
Dacrydium araucariodies	
Dacrydium cupressinum	5 1213 17 19 21 25 4041 43a
Dacrydium franklinii	45 7 12 17 43a44
Dais cotinifolia	43a 4546
Dalbergia sissoo	42
Dalechampia roezleana	13 16 2627 41
Dampacanthus indicus	
Dampiera brownii	5
Dampiera purpurea	5
Dampiera stricta	6
Daphne collina	23
Daphne genkwa	45 7 10 15 1718192021 23
Daphne laureola	345 7
Daphne mezereum	12
Daphne odora	2345678 10 1213 15 1718192021 232425262728293031 353637 3940 41a 43 44 46 48
Daphne Xhoutteana	21
Daphne Xhybrida	2345678 10 13 1819
Darwinia fascicularis	56
Darwinia taxifolia	5
Daubentonia longifolia	4 7 10 12

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Davallia canariensis		13	151617								
Davallia denticulata		13	17	20							
Davallia fejeensis				2021							
Davallia pyxidata		13	151617	19 21	2627					45	
Davallia trichomanoides			17	192021	2627						
Daviesia acicularis	5	14									
Daviesia corymbosa	6										
Daviesia latifolia	6										
Daviesia squarrosa	5										
Daviesia ulicifolia	56	14									
Daviesia umbellulata	6										
Delonix regia	3	13	18		2627			39		43 44	
Dendrocalamus strictus	45										
Dennstaedtia davallioides	5										
Deutzia corymbosa	10										
Deutzia crenata		1213	15	1718192021	2324	2627282930		35 37			
Deutzia discolor						2627 29					
Deutzia gracilis	78 10	1213	15	1718192021	2324	2627282930		353637383940		43	44
Deutzia scabra	345678 10	13	15	1718192021	24	2627 2930		353637	3940'141a	4343a	
Deutzia setchuenensis					24	2627					
Deutzia vilmoriniae						27 29		35			
Deutzia Xlemoinei						2627 29		35 37	39		
Deutzia Xrosea					24	2627 29		353637	39404141a	4343a	
Dianella ensifolia										44	
Dichorisandra thyrsiflora	7		17			27					
Dichroa febrifuga	78 10	13	16								
Dicksonia antarctica	56	13	151617	192021		2627		34	40		46
Dicksonia squarrosa			151617	19							
Dictyosperma album		13	1617			2627					
Diervilla Xsplendens			15								
Diffenbachia maculata		13	17							444546	
Dillwynia acicularis	5	14									
Dillwynia ericifolia											
Dillwynia floribunda	5	14									
Dillwynia juniperina	6										
Dillwynia parvifolia										45	

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Dillwynia retorta	28
Dioscorea discolor	12 16 18 2627 2930
Dioscorea elephantipes	2
Diosma ericoides	345 78 1213 15 1718192021 24252627 293031 3536373839404141a 4343a
Diospyros ebenum	1
Diospyros kaki	7 1213 161718 20 23 252627282930 32 34 383940 43a44 46 4849
Diospyros lotus	34
Diospyros virginiana	39
Dipilopappus filifolius	23 2627 3536373839404141a 4343a44 46
Dipladenia Xbrearleyana	17
Diplandra cassinoida	5
Diplazium australe	56 13 1516 19
Diplazium thwaitesi	13 21 2627
Diploglotiss australis	45 7 10 15 1718 21 2627 2930
Diplothemium maritimum	2627
Distictis buccinatoria	45 78 10 1213 15 171819 23 27 293031 353637 404141a 4343a44
Dizygotheca elegantissima	12 1516 18 20
Dizygotheca · eitchii	15161718 2627 2930 39
Dodonaea attenuata	44
Dodonaea boroniifolia	6
Dodonaea ericifolia	6
Dodonaea triquetra	5
Dodonaea viscosa	6 14 37 43a44 46 49
Dolichos lablab	7
Dolichos lignosus	345678 131415 17181920 23242526272829303132 353637 394041 43 48
Dombeya burgessiae	13 15 1819 21 24 2627 29 31 353637 39 41 43a
Dombeya mollis	2627
Dombeya spectabilis	43a
Dombeya tiliacea	1718 2021 24252627 2930 33 35 37 39 43
Dombeya wallichii	12
Doodia aspera	5 13 151617 19
Doodia caudata	13 17 21
Doodia maxima	17
Doodia media	13 19
Doryanthes excelsa	56 8 10 12 1415 171819 21 2627 293031 353637 39 4343a44
Doryanthes palmeri	1718 21 24 26 353637 39 41 43a

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Doryopteris concolor	15 17
Doryopteris nobilis	13 15
Doryopteris pedata	17
Doryphora sassafras	78 10 15 171819 36 41 4343a44
Dovyalis caffra	16 24 26272829 34353637 40
Doxantha capreolata	2 36 40
Dracaena deremensis	44
Dracaena draco	12 1718 21 24 2627 29 353637 41 43a
Dracaena fragrans	13 161718 2021 2627 2930 35 37 39 44
Dracaena goldieana	16 18 21
Dracaena sanderana	21 2627 2930
Dracaena surculosa	44
Dracophyllum capitatum	5
Dracophyllum secundum	5
Dryandra floribunda	37
Dryandra quercifolia	13
Dryopteris cristata	13
Dryopteris dentata	2627
Dryopteris gracilis	1516 19
Dryopteris richardsii	13 21 2627
Dryopteris serrata	13 1516
Dryopteris varia	13
Dryopteris velutina	16 19
Duranta repens	45678 10 1213 15 1718192021 2324252627 293031 3334353637 39404141a 4343a44 46 48
Duvernoia adhatodoides	36 41
Dysoxylum fraseranum	42
Eccremocarpus scaber	5 32
Echeveria agavoides	27
Echeveria coccinea	36
Echeveria fulgens	13 171819 27
Echeveria gibbiflora	171819 24 2627 36
Echeveria rosea	36
Echeveria secunda	171819 24 2627 43a
Echinopsis eyriesii	4 7
Echites andrewsii	4 7
Echium candicans	18 24

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Edgeworthia papyrifera	78 10 13
Ehretia tinifolia	7
Elaeagnus angustifolia	12 2627 29
Elaeagnus commutata	10 21 24
Elaeagnus latifolia	
Elaeagnus macrophylla	2627 39 43
Elaeagnus multiflora	21 24 2627 29
Elaeagnus pungens	15 1819 31 35 37 41 4343a
Elaeagnus umbellata	13 2930 33 36 40 41a 48
Elaeocarpus dentatus	2 5
Elaeocarpus grandis	18
Elaeocarpus reticulatus	56 8 121415 1819 21 28 31 353637 39404141a 4343a
Elaeocarpus serratus	26
Elaus oleifero	17
Enkianthus campanulatus	44
Enkianthus perulatus	43a
Ensete ventricosum	17 21 2324 2627 293031 353637 39 44
Entelea arborescens	2 6 12
Epacris impressa	56
Epacris longiflora	5 7 10 1415 1819 28
Epacris paludosa	2 10 1415 1819 28
Epacris pulchella	56 14
Epiphyllum erypetalum	8 13
Epiphyllum phyllanthus	4 7
Epipremnum aureum	1718
Eranthemum macrophylla	16 1819
Eranthemum pulchellum	13 16 18 37 39 41a 43
Eranthemum strictum	5 8 18
Eranthemum tricolor	20
Ercilla spicata	4
Eremophila brownii	5
Eremophila longifolia	5
Eremophila maculata	56 17
Erica albens	5
Erica arborea	13 1617 25
Erica archeria	2

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Erica baccans	2345 7 151617 19
Erica bauera	45 12 151617 19 21 25 30 36
Erica canaliculata	5
Erica cerinthoides	2 5 21 33
Erica cinerea	5
Erica concinna	21
Erica corifolia	5
Erica cruenta	16 30
Erica formosa	21 30
Erica hyemalis	12 1516 19 21 30
Erica jubilee	25 30 36
Erica linnaeoides	21 36
Erica mackinnoniae	21 30
Erica mammosa	45 16 21 30
Erica melanthera	36 444546
Erica multiflora	345
Erica nudiflorum	2 4
Erica parviflora	2 45
Erica persoluta	5 12 16 21 25 30
Erica petiveri	2 5
Erica pinea	2 4
Erica plukenettia	5
Erica pyramidalis	16 25 30 44
Erica regerminans	36
Erica rubens	2
Erica tetralix	3
Erica tricolor	12 21
Erica ventricosa	21
Erica verticillata	345 16 19
Erica Xautuminalis	21 33
Erica XCavandishii	12 1617 19 21 25 30
Erica Xintermedia	21 30 36
Erica Xwebbleyiana	21 30 36
Erica Xwilmorei	12 151617 19 21 25 30 49
Eriobotrya japonica	12345 7 10 1213 161718 20 2324 2627282930 333435 37 3940 44 46 49
Eriocephalus africanus	36

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Eriostemon buxifolium	45 7 14 36 404141a 43a
Eriostemon myoporoides	56 1415 171819 21 242526 3839 43 444546
Erythrina acanthocarpa	41
Erythrina blakeii	4 78 1213 36 3940 43a
Erythrina caffra	45678 13 24 2627 28 35 37 39
Erythrina corallodendrum	345 78 10 13 40 42
Erythrina crista-galli	2345678 13 15 171819 21 24 2627 293031 353637383940 4141a 4343a44
Erythrina herbacea	345 78 10 12 15 171819 2627
Erythrina humeana	345 21 43a
Erythrina macrophylla	5
Erythrina parcelii	13
Erythrina secundifolia	6 8 10 13 15 171819
Erythrina speciosa	5 12 21 36 41
Erythrina subumbrans	34 7 35
Erythrina variegata	2 4 21 2627 2930 36 38 4141a 4343a
Erythrina vespertilio	45 7 10 12
Erythrina Xbidwillii	45 78 10 1213 15 17 19 21 2627
Erythrina Xhendersoni	39
Escallonia bifida	78 10 1213 15 1718192021 2324 2627 293031 353637 39 43
Escallonia coccinea	8
Escallonia laevis	45 78 10 1213 15 171819
Escallonia rosea	6
Escallonia rubra	234567 10 1213 15 1718192021 2324252627 293031 343536373839404141a 4343a44 46 48
Escallonia Xexoniensis	21 2627
Escallonia Xiveyi	41 43a
Escallonia Xlangleyensis	29 36 4041 4343a
Escallonia Xrockii	37 39 41a 4343a44
Eucalyptus acaciiformis	42 46
Eucalyptus agglomerata	42
Eucalyptus albens	42
Eucalyptus amplifolia	42
Eucalyptus amygdalina	6 1415 19 25262728 41
Eucalyptus andrewsii	42
Eucalyptus astringens	35 42
Eucalyptus bicostata	42 43a
Eucalyptus blakelyi	41 42

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Eucalyptus blaxlandii	42
Eucalyptus botryoides	2930 353637 394041 42 43a444546
Eucalyptus brachycorys	42
Eucalyptus brockwayi	42
Eucalyptus caesia	36
Eucalyptus calophylla	14 21 25 28293031 353637 39404141a424343a444546
Eucalyptus calycogona	42
Eucalyptus camaldulensis	6 252627 41 4243 444546
Eucalyptus campaspe	42
Eucalyptus camphora	42
Eucalyptus cinerea	41 42 43a 4546
Eucalyptus citriodora	1415 1718192021 232425262728293031 3536373839 4141a42 43a444546
Eucalyptus cladocalyx	18 21 232425262728293031 353637383940 41a42 43a444546
Eucalyptus cloeziana	42
Eucalyptus conica	42
Eucalyptus crebra	39 42 46
Eucalyptus dawsonii	42
Eucalyptus deanei	45
Eucalyptus delegatensis	42
Eucalyptus diversicolor	262728
Eucalyptus dives	42 46
Eucalyptus elata	42
Eucalyptus eremophila	36
Eucalyptus erythronema	353637 39 42
Eucalyptus eximia	41 42 4546
Eucalyptus fastigata	33
Eucalyptus fibrosa	1415 19 2728 42
Eucalyptus ficifolia	1718 21 232425262728293031 353637 39404141a424343a444546 48
Eucalyptus forrestiana	41 42 43a
Eucalyptus gillii	42
Eucalyptus globulus	6 1415 1718192021 2324 26272829303132 353637 3940 41a 43 444546
Eucalyptus gomphocephala	2627 29 39 41
Eucalyptus goniocalyx	14 19 262728 42
Eucalyptus grandis	42
Eucalyptus gummifera	1415 19 25262728 36 39 42
Eucalyptus gunnii	252627 46

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Eucalyptus haemastoma		1415	19		26272829						46
Eucalyptus incrassata	6										
Eucalyptus kruseana											45
Eucalyptus laevopinea									42		
Eucalyptus largiflorens		1415	19		262728				42		
Eucalyptus lehmannii									42		
Eucalyptus leucoxylon		15			2627			41	42	45	
Eucalyptus linearis											
Eucalyptus longifolia		1415	19		2627					45	
Eucalyptus macarthurii				25				41	42		
Eucalyptus macrocarpa				27		31	36		42	44	
Eucalyptus macrorhyncha									42		
Eucalyptus maculata				28			36	39	41	424343a444546	
Eucalyptus maidenii							36			42	
Eucalyptus mannifera										4546	
Eucalyptus marginata		1415	19		26272829				41		
Eucalyptus melliodora		14	19		26272829		36	40		4243	4445
Eucalyptus microcarpa										42	
Eucalyptus microcorys							36	39		42	43a
Eucalyptus moluccana		1415			262728					42	46
Eucalyptus muelleriana										42	
Eucalyptus nicholii										42	43a 4546
Eucalyptus nortonii										42	
Eucalyptus novaanglica										42	
Eucalyptus nutans									41		
Eucalyptus obliqua		1415	19		262728						
Eucalyptus obtusifolia		1415	19								
Eucalyptus paniculata		1415	19		262728					42	
Eucalyptus pauciflora	6						33			42	
Eucalyptus perriniana											4546
Eucalyptus pilularis		1415	19		25262728			39	41	42	44
Eucalyptus piperita	56	14	19		262728						
Eucalyptus platens					26						
Eucalyptus polyanthemos										42	
Eucalyptus populnea										42	
Eucalyptus propinqua										42	

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Eucalyptus pulverulenta	5
Eucalyptus punctata	42 4546
Eucalyptus pyriformis	36 39
Eucalyptus racemosa	43a
Eucalyptus radiata	42
Eucalyptus regnans	14 19 262728 41
Eucalyptus resinifera	14 19 25262728
Eucalyptus robusta	1415 19 262728 39 41 4243
Eucalyptus rubida	42
Eucalyptus saligna	5 14 19 2627 42 43a 46
Eucalyptus salmonophloia	42
Eucalyptus salubris	42
Eucalyptus scoparia	42 46
Eucalyptus sideroxylon	36 39404141a424343a444546
Eucalyptus sieberi	25
Eucalyptus spathulata	42 46
Eucalyptus st johnii	4546
Eucalyptus stellulata	42
Eucalyptus stricklandii	36 42
Eucalyptus tereticornis	1415 19 262728 41 42 46
Eucalyptus tetragona	39 42
Eucalyptus tetraptera	36 41
Eucalyptus torquata	3536 40 42 44
Eucalyptus viminalis	25262728 39 46
Eucalyptus woodwardii	42
Eucalyptus youmanii	42
Eugenia brasiliensis	8 13
Eugenia foetida	17
Eugenia uniflora	67 10 13 15 171819 21 2627 2930 41a
Euonymus europaea	345 7 12 18 25 31 3637 404141a 44
Euonymus fimbriata	8
Euonymus fortunei	10 1213 15 17 19 21 2324 2627 29 43a
Euonymus japonicum	2345678 10 1213 15 1718192021 2324252627 293031 353637 39404141a 4343a444546 48
Euonymus latifolia	15 19 2627 2930 36 39 4141a 4343a44
Euonymus obovata	44
Eupatorium coelestinum	8

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Eupatorium megalophyllum	36 39404141a 4343a4445
Eupatorium riparium	15 20
Eupatorium serulatum	21
Eupatorium sordidum	7 10 13 15 171819 30 353637 39 44
Euphorbia aphylla	27
Euphorbia atropurpurea	27
Euphorbia canariensis	27 36
Euphorbia characias	6
Euphorbia fulgens	2 45 78 10 13 15161718192021 24 2627 2930 41
Euphorbia grandidens	36
Euphorbia pulcherrima	5 8 10 1213 15 1718 2021 2324252627 293031 3536373839404141a 4343a44 46
Euphorbia regis-jubae	27
Euphorbia splendens	45 78 10 1213 15 1718192021 2324 2627 293031 3536373839404141a 43 44
Euphorbia triangular	2
Eupomatia laurina	2 78 10 15 17 19 21
Eustrephus latifolius	2 56
Eutaxia microphylla	17
Exocarpos cupressiformis	56 14
Exocarpos strictus	5 14
Exochorda korolkowii	27 29
Exochorda racemosa	25 293031 353637 39404141a 4343a44
Fabiana imbricata	12 15 181920 24 26 36
Fagelia bituminosa	4 7
Fagus sylvatica	345 78 10 15 171819 21 24 2627 293031 353637 3940 4343a4445
Fatsia japonica	8 1213 15 1718192021 2425 28 39 41 4343a44 46
Feijoa sellowiana	31 353637 39404141a 4343a44 48
Felicia amelloides	18 20 2324 26 29303132 40 41a 43 48
Felicia echinata	
Felicia fruticosa	2 13 15 171819
Ficus aspera	13 16 18 26 3536
Ficus bellingeri	36
Ficus bengalensis	2 8 13 19
Ficus benjamina	1415 1819 21 2324 262728293031 35 37383940 444546
Ficus cannonii	13
Ficus carica	12345678 10 13 161718 20 2324 2627 293031 333435 37383940 43 444546 4849
Ficus elastica	5 7 10 1213 15 2021 24 2627 2930 36 444546

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Ficus hilli	35363738394041 4343a444546 4849
Ficus lyrata	46
Ficus macrophylla	4 678 10 12131415 1718192021 2324 2627282930 353637 39404141a 4343a4445
Ficus nymphaefolia	
Ficus pumila	45678 10 13 15 1718192021 2324 262728293031 353637 39404141a 4343a4445
Ficus racemosa	
Ficus religiosa	7 12 1819 26
Ficus rubiginosa	56 8 10 131415 1718192021 2324 262728293031 353637 3940 41a 4343a4445
Ficus sagittata	27 30 35 37 39 43 44
Ficus superba	36
Ficus sycomorus	45 78 10 13 17
Ficus virens	26
Filipendula camtschatica	
Firmiana simplex	
Fitzroya cupressoides	12
Flacourtia jangomans	45 78 15
Flindersia australis	8 1718 41 42 43a
Fokenia hodginsii	2930 35 37
Fontanesia phillyreoides	
Forsythia ovata	
Forsythia suspensa	8 10 13 15 1819 2930
Forsythia viridissima	45 78 10 13 15 171819 21 24 2930 353637 39404141a 4343a44
Forsythia Xintermedia	36 41 4343a 4546 49
Fortunella japonica	1213 1617 4445 47 49
Fortunella margarita	2324 28 35 37 39
Fothergilla gardenii	
Frankenia laevis	49
Franseria artemisoides	
Fraxinus americana	26272829 36 4041 43a44
Fraxinus angustifolia	36 404141a 43a 4849
Fraxinus caroliniana	
Fraxinus excelsior	345 7 10 13 171819 21 24 2627 293031 353637 39404141a424343a4445 49
Fraxinus nigra	36
Fraxinus nigra	
Fraxinus ornus	3 567 10 353637 3940 43a44
Fraxinus oxycarpa	36 41

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Fraxinus pennsylvanica	
Fraxinus syriaca	42
Fraxinus velutina	
Fraxinus xanthoxyloides	
Fremontodendron californicum	
Freycinetia australiensis	8 10
Freycinetia banksii	5
Fuchsia coccinea	6
Fuchsia corymbiflora	5678
Fuchsia denticulata	5 7
Fuchsia excorticata	5
Fuchsia fulgens	345678
Fuchsia macrantha	7
Fuchsia macrostigma	5 7
Fuchsia Xexoniensis	678 44
Furcraea bedinghausii	
Furcraea foetida	45678 24 2627
Galega officinalis	1
Galphimia glauca	21 39 41 43a
Garcinia mangostana	8
Gardenia devoniana	7
Gardenia jasminoides	12345678 10 1213 15 1718192021 2324252627 293031 36 39404141a 4343a444546 4849
Gardenia lucida	45 7
Gardenia thunbergia	345 78 1213 15 171819 21 24 2627 39 4343a
Garrya elliptica	8 15 1819 21 45
Gaultheria antipoda	2
Geijera parviflora	39 41 43a
Geitonoplesium cymosum	5 14 28
Gelsemium sempervirens	2 78 10 1213 15 1718192021 2324 2627 293031 3536373839404141a 4343a444546
Genista aethnensis	6 36 41
Genista anglica	345 7
Genista hispanica	43a
Genista monosperma	36
Genista tinctoria	6 41 43a
Ginkgo biloba	345 78 10 1213 1718192021 232425262728293031 3536373839404141a 4343a4445
Gleditsia japonica	27

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Gleditsia macracantha	5
Gleditsia sinensis	234567 10 24 2627 29 3536373839 4141a 4343a
Gleditsia triacanthos	234567 43a
Glochidion ferdinandi	
Gloriosa superba	2 6
Glyptostrobus lineatus	10
Gmelina asiatica	4 42
Gmelina leichhardtii	
Gompholobium grandiflorum	5 14
Gompholobium latifolium	5
Gompholobium pinnatum	5
Gompholobium polymorphum	5 14 3637 39404141a 4343a444546 49
Gordonia axillaris	36 4041 43a
Graptophyllum earlii	
Graptophyllum excelsum	12 21 24 2627 2930 35 37 39 45
Graptophyllum pictum	45 7 13 161718 2627 45
Grevillea acanthifolia	
Grevillea alpina	6 37 394041 424343a44
Grevillea aquifolium	6 45
Grevillea aspleniifolia	43a 45
Grevillea banksii	8 12131415 171819 21 31 353637383940414 1a424343a444546
Grevillea baueri	4546
Grevillea biternata	4546 49
Grevillea buxifolia	14
Grevillea caleyi	45 78
Grevillea chrysophaea	6
Grevillea crithmifolia	49
Grevillea ericifolia	6
Grevillea glabella	45 47
Grevillea hilliana	8 1213 15 171819 21 282930 35 37 4546
Grevillea hookerana	
Grevillea ilicifolia	6
Grevillea jenkinsii	4445
Grevillea juniperina	1415 4546 49
Grevillea lanigera	49
Grevillea linearifolia	14 36 45

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Grevillea longifolia	5 46
Grevillea longistyla	46
Grevillea obtusiflora	49
Grevillea parviflora	6
Grevillea punicea	5 39 47
Grevillea repens	6
Grevillea robusta	345678 10 1213 15 1718192021 232425262728293031 3536373839404141a424343a444546 49
Grevillea rosmarinifolia	3637 39 4141a 4343a444546 49
Grevillea sericea	5 46
Grevillea striata	42
Grevillea thelemanniana	4546
Grevillea tripartita	47
Grevillea Xcanberragem	46
Grevillea Xivanhoe	4546
Grevillea Xpink pearl	45
Grevillea Xpoorindaconst.	45
Grevillea Xrobyngordon	49
Grewia occidentalis	15 1718 24 41
Greyia sutherlandii	21
Gymnocladus dioica	2627
Hakea acicularis	56 10 14 32
Hakea amplexicaulis	5
Hakea gibbosa	14 44
Hakea laurina	12 24 2627 2930 353637 39404141a42 444546
Hakea leucoptera	42
Hakea pugioniformis	5 14
Hakea purpurea	6
Hakea salicifolia	4546 49
Hakea saligna	5 14 25 40 41a 4343a44
Hakea suaveolens	15 1819 24 46
Hakea tephrosperma	42
Hakea ulicina	6
Hakea victoriae	10 45
Halesia carolina	43a
Halesia tetraptera	34 7 10 2627 29
Halgania cyanea	45

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Halimium lasianthum	10 15 181920 39
Hamamelis mollis	19
Hamelia patens	5 15 171819
Hardenbergia comptoniana	5 171819 262728 41
Hardenbergia violacea	56 8 10 1415 1718 21 24252627282930 36 41 43a 46
Harpephyllum caffrum	31 36 39404141a 4343a4445
Harpullia pendula	12 41 42 43a
Hebe albicans	36
Hebe buxifolia	21 24 41a 43 4445
Hebe cupressoides	18 40
Hebe diosmifolia	1819 24 2627 44
Hebe elliptica	5 10 13 41 43a
Hebe gracilima	5 24 2627 293031 35 37 39 43
Hebe hectorii	18 35 37 39 43 44
Hebe hulkeana	6 15 1718192021 2627 31
Hebe inspiratina	49
Hebe parvifolia	56
Hebe salicifolia	4 678 13
Hebe speciosa	6 8 12 15 1718192021 2324 2627 293031 3536373839404141a 4343a444546
Hebe Xandersonii	78 10 1213 18192021 2324 27 293031 353637 39404141a 43a44
Hebe Xla seduisante	36 4141a 4343a44
Hebe Xlobelioides	24 2627 3031 353637 39404141a 4343a
Hebe Xwairiki	36
Hedera canariensis	24 2627 2930 36 41 4343a444546
Hedera helix	2345678 10 13 15 1718192021 232425 2627 293031 3536373839404141a 4343a444546
Hedera rhombea	18 21 24
Hedychium coronarium	6 10 13 1718 23 2627 29 31 43a
Hedychium flavum	43a
Hedychium gardneranum	23 2627 31
Hedysarum coronarium	6
Hedyscepe canterburyana	13 1617 20 24 2627 3435 37 39
Helichrysum diosmifolium	5 14
Heliconia metallica	13
Heliocereus speciosus	2 4 678 15 171819
Heliotrope arborescens	2 4 678 13 15 17 192021 2324 2627 293031 353637 48
Heliotrope Xvoltaireanum	8 15 17 19 21 36 39404141a 4343a44

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Heterocentron elegans	36 404141a 43a
Heterocentron macrostachyum	31 35 37 40
Heterocentron roseum	43a
Heteromeles arbutifolia	3 7
Heuchera sanguinea	2930 35 37 40
Hibbertia diffusa	36
Hibbertia fasciculata	6
Hibbertia linearis	5 14
Hibbertia saligna	5
Hibbertia scandens	5 14 45
Hibbertia stellaris	
Hibbertia stricta	5
Hibbertia virgata	5
Hibiscus camdeni	21 2324 2627 293031 353637 39 4141a 4343a44
Hibiscus coccineus	29
Hibiscus elatus	2627
Hibiscus grandiflorus	2 8 13 1516 1819 21 2627
Hibiscus heterophyllus	5 8 17 19 42
Hibiscus huegelii	13
Hibiscus indicus	6 30 35 37 39 43
Hibiscus lasiocarpus	2930
Hibiscus moscheutos	4 7 353637
Hibiscus mutabilis	34567 13 15 171819 21 2627 2930 353637 39404141a 4343a
Hibiscus parkerii rosea	12
Hibiscus pedunculatus	4 7 26
Hibiscus radiatus	4 7
Hibiscus rosa-sinensis	2345678 1213 151617181920 21 2324 2627 293031 353637 39404141a 43 444546
Hibiscus splendens	2345 78 13 15 18 2627
Hibiscus syriacus	345678 13 15 171819 21 232425 2627 2930 3536373839 4141a 4343a444546
Hibiscus tiliaceus	6
Hibiscus trionum	6
Histiopteris incisa	5 13 151617 19
Hoheria populnea	25 39 43
Holmskioldia sanguinea	2 4 10 15 27 36 39404141a 4343a444546
Holodiscus discolor	2627 293031
Homalocladium platycladum	18

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Houstonia longifolia	17
Hovea celsii	45 7
Hovea longifolia	56 14
Hovenia dulcis	45678 10 1213 161718 2324 2627 2930 3536373839 41 43a
Howea belmoreana	13 1617 1920 24252627 3435 37 39
Howea forsterana	13 1617 20 24 2627 3435 37 44
Hoya australis	45 7 10 17
Hoya bella	45678 10 13 161718
Hoya carnosa	345678 10 1213 15161718192021 2324 2627 293031 35 37 39404141a 43 44 46
Hoya coriacea	12
Hoya imperialis	13
Hoya multiflorum	8 13 16 18
Hydrangea macrophylla	34567 10 1213 15 1718192021 2324252627 293031 3536373839404141a 4343a444546 48
Hydrangea paniculata	21 2324252627 2930 353637 39404141a 4343a444546
Hylocereus triangularis	4 78 15
Hymenaea courbaril	45
Hymenanthera dentata	6
Hymenosporum flavum	24 2627 2930 35 37 39404141a424343a444546 48
Hyophorbe americaulis	16
Hyophorbe verschaffeltii	16 2627
Hypericum calycinum	7 19 36 41 43a 4546
Hypericum canariense	15 17 21
Hypericum chinense	15 1819
Hypericum japonicum	56
Hypericum oblongifolium	8
Hypericum olympicum	45 78 43a
Hypericum patulum	36 39404141a 4343a4445 48
Hypericum reptans	41
Hypericum Xmoseranum	2021 2324252627 293031 353637 39404141a 4343a444546
Hypocalymma angustifolium	45
Iboza riparia	45
Idesia polycarpa	3637 39 4141a 43a
Ilex aquifolium	2345 78 10 13 15 1718192021 2324252627 293031 3536373839404141a 4343a4445 48
Ilex cornuta	5 78 10 1213 15 1718192021 24 2627 293031 353637 39 41 4343a4445 48
Ilex crenata	5
Ilex opaca	8 10 15 171819 21

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Ilex paraguariensis	15 17 21 24 2627 29
Ilex perado	6
Ilex verticillata	
Ilex Xaltaclarensis	15 17 46
Illicium anisatum	2345 78 10 13 15 171819 21 24 2627
Indigofera australis	56 8 10 131415 171819 26
Indigofera gerardiana	3940 43
Indigofera incarnata	5678 10 1213 15 171819 21 24 2627 41a 44
Indigofera potaninii	43a
Indigofera pulchella	2
Iochroma cyaneum	6 293031 35 37 39 4343a444546
Iochroma fuchsiodes	35
Iochroma grandiflora	2930 39 43
Ipomoea acuminata	17 21 2324 2627 30 32 353637 39 41 43a
Ipomoea alba	6 14 181920 23 30 353637 39
Ipomoea bonariensis	17 21
Ipomoea digitata	18
Ipomoea leptophylla	15
Ipomoea palmata	4 67
Ipomoea pandurata	21 23 27 29
Ipomoea purpurea	5 7 20
Ipomoea Xhardingii	14 19
Isopogon anemonifolius	4445
Isopogon anethifolius	44
Isopogon formosus	56
Ixora chinensis	45 78 13 1617 27 2930
Ixora coccinea	45 78 13 161718 2627 2829
Ixora duffii	17
Ixora fulgens	5
Ixora javanica	13
Ixora parviflora	17
Ixora speciosa	
Ixora williamsii	18
Jacaranda acutifolia	42 46
Jacaranda mimosifolia	8 13 1718192021 232425262728293031 3536373839404141a 4343a4445
Jacaranda obtusifolia	5

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Jacksonia scoparia	2 14
Jacobinia carnea	13
Jacobinia sericea	45678 13 15 171819 2627
Jacquinia aurantiaca	45 7
Jagera pseudorhus	42
Jambosa purpurea	8
Jasminum azoricum	13 18 41 43a 46
Jasminum beesianum	39 43
Jasminum didymum	4 7
Jasminum fruticans	345 7 10 13 15 1718192021 2324 2627 293031 353637 39404141a 43 45 48
Jasminum grandiflorum	4 67 10 13 15 1718192021 2324252627 293031 353637 39404141a 4343a44
Jasminum humile	4 678 12 192021 25
Jasminum leratti	7 10 13
Jasminum lineare	45 78
Jasminum mesnyi	252627 2930 353637 39404141a 4343a44
Jasminum multiflorum	4 7 171819
Jasminum nitidum	41 43a
Jasminum nudiflorum	5 78 10 17 2324 2627
Jasminum odoratissimum	3
Jasminum officinale	12345678 10 13 24 2627 35 37 39 43 444546
Jasminum polyanthum	43a444546
Jasminum revolutum	2627 29
Jasminum sambac	3 678 10 12 15 17 2021 36 41 4343a4445
Jasminum volubile	345678 10 13 15 1718 2021 24 2627 29
Jasminum Xstephanense	3637 39404141a 4343a
Juanulloa aurantiaca	45 78 13
Jubaea chilensis	9 17
Juglans ailantifolia	2324 2627282930 33 35 37 3940
Juglans nigra	23 40
Juglans regia	2345 78 10 1213 161718 2324 2627282930 3435 37 3940 43a 46 4849
Juniperus bermudiana	45 78 10 1213 15 17 192021 24 262728293031 35 37 39 4141a 43a44
Juniperus chinensis	45 7 10 15 17 19 21 2324 2627282930 3637 39404141a 4343a444546 49
Juniperus communis	4 78 10 12131415 17181920 2324 262728293031 353637383940 4141a 4343a44
Juniperus conferta	4546
Juniperus deppeana	46
Juniperus excelsa	4 78 10 14

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Juniperus horizontalis	45 678 12 15 21
Juniperus oxycedrus	4 78 10 12131415 17 19 21
Juniperus phoenicea	19
Juniperus procera	18 28 3031 3536373839404141a 4343a44
Juniperus recurva	4 7 49
Juniperus rigida	27
Juniperus sabina	45 7 10 12 14 36 38 4343a4445 49
Juniperus squamata	41 4343a 46 49
Juniperus virginiana	45 78 10 12131415 17 19 21 2324 262728293031 35 37 3940
Justicia adhatoda	4567 17 21 24 2627 3536 38
Justicia brandegeana	31 41a 4343a
Justicia carnea	4 678 15 171819 24 2627 35 37 39 41a 43
Justicia cydoniifolia	8 13 15 171819
Justicia ghiesbreghtiana	7
Justicia magnifica	24 2627 31 36 38 41 43a44
Justicia rizzinii	13 15 17181920 24 2627 29 35363738394041 4343a4445
Justicia spicigera	13
Kalanchoe flammea	27
Kalanchoe marmorata	36
Kalanchoe pinnata	45678
Kalmia angustifolia	44
Kalmia latifolia	8 2930 37 44 46
Kennedia coccinea	18
Kennedia nigricans	28 32
Kennedia prostrata	56 14
Kennedia rubicunda	56 1415 28 39 44
Kerria japonica	34 678 10 13 15 171819 21 24 2627 293031 3536373839 4141a 4343a44
Knightia excelsa	25
Koelreuteria bipinnata	43a
Koelreuteria paniculata	34567 18 36 394041 43a44
Kolkwitzia amabilis	36 41 4343a444546
Kunzea capitata	5
Kunzea parvifolia	4546
Kunzea pulchella	49
Kydia calycina	45
Laburnum alpinum	67

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Laburnum anagyroides	34 67 10 13 15 171819 21 2324 272829 31 353637 39404141a 43a444546
Laburnum Xwatereri	36 44 49
Laccospadix australasica	
Lagerstroemia indica	2345 78 10 1213 15 171819 21 24 2627 293031 3536373839404141a 4343a444546 4849
Lagerstroemia speciosa	36 39404141a 4343a44
Lagunaria patersonii	2345 78 10 1213 15 171819 21 2324 2627 293031 3536373839404141a424343a44
Lambertia formosa	5 14 45
Lantana camara	34 78 2627 2930 3536373839404141a 4343a444546
Lantana crocea	45678 10 17
Lantana montevidensis	2 45 78 1718 20 252627 2930 3536373839404141a434343a44 46
Lantana trifolia	7
Lapageria rosea	17 2324 2627
Lardizabala biternata	78
Larix decidua	8 10 14 23 2930 32 3637 39
Larix kaempferi	29
Larix Xeurolepis	36
Lasiopetalum baueri	6
Lasiopetalum ferrugineum	5
Lasiopetalum parviflorum	5
Latania lontaroides	13 1617 20 2627 36
Laurus nobilis	1 345678 10 1213 15 1718192021 2324 2627 293031 353637 39404141a 4343a44
Lavandula angustifolia	1 5 8 12131415161718192021 24 2627 293031 353637 39404141a 4343a44 49
Lavandula dentata	5 8 12 17181920 36 39404141a 4343a444546
Lavandula latifolia	46
Lavandula stoechas	7 19 24 2627 2930 35 37 43a
Lawsonia inermis	4
Leonotis leonurus	56 2627 2930 3536373839404141a 4343a44
Lepidorrhachis mooreana	13 1617 24 26
Lepidozamia peroffskyana	1617 2627
Leptolepia novae-zelandiae	151617 19
Leptomeria acida	5 14
Leptomeria billardieri	5
Leptopteris fraserii	17
Leptopteris hymenophylloides	17
Leptopteris superba	17 2627
Leptospermum flavescens	2 4567 14 46

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Leptospermum juniperinum	6 49
Leptospermum laevigatum	6 36 42
Leptospermum lanigerum	14 45
Leptospermum myrsinoides	42
Leptospermum nitidum	45
Leptospermum petersonii	36 42 43a444546
Leptospermum rotundifolium	36 41 42 4546 49
Leptospermum scoparium	56 14 25 30 353637383940414 1a 4343a444546
Leptospermum squarrosum	41 42 43a
Leptospermum XFairyrose	43a
Leptospermum Xwalkerii	41
Leucaena glauca	4 7
Leucodendron argenteum	2 56 12 30 35 37 39
Leucodendron grandiflorum	6
Leucodendron salignum	6
Leucopogon amplexicaule	5
Leucopogon ericoides	5
Leucopogon lanceolatus	2 14
Leucopogon microphyllus	14
Leucopogon muticus	5
Leucopogon parviflorus	6
Leucopogon virgatus	5
Leucospermum concarpodendrum	6
Leucothoe axillaris	12
Leucothoe recurva	46
Leycesteria formosa	45 7 10 1718 21 24 39 43
Libocedrus doniana	10 4041 43a
Libocedrus plumosa	21 2627 39 45
Ligustrum indicum	10 17
Ligustrum japonicum	4 7 10 13 15 171819 2324 2627 29 31
Ligustrum lucidum	4567 10 15 171819 2324 2627 293031 353637383940414.a 4343a44 48
Ligustrum ovalifolium	15 17 19 23 2627 2930 353637 39404141a 4343a444546
Ligustrum sinensis	8 12 18 2021 24252627 293031 36 39 4141a 4343a44 48
Ligustrum undulatum	8 1213 15 17181920 23 25
Ligustrum vulgare	345678 13 15 17 21 2324 2627 2930 40 41a
Limonium roseum	24 2627 30 36 41

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Linospadix monostachya	13 1617
Linum monogynum	2
Liquidambar orientalis	4546
Liquidambar styraciflua	345 7 232425262728293031 353637 39404141a 4343a444546 4849
Liriodendron tulipifera	5 8 10 12 15 171819 21 2324 262728293031 353637 39404141a 4343a444546 4849
Litchi chinensis	2 13 17
Lithocarpus glaber	4 67 17
Livistona australis	3 5 78 10 1213 1617 1920 24 2627 31 3435 37 39 42
Livistona chinensis	13 16 24 31 35 37 39
Livistona humilis	45 7
Livistona woodfordii	2627
Lobia ferox	7
Lomaria lanceolatum	5
Lomatia ilicifolia	6
Lomatia myricoides	56
Lomatia silaifolia	5
Lonicera caprifolium	34 78 10 13 17 21 2627 293031 353637 39404141a 4343a44
Lonicera etrusca	2627 2930 35 37 3940 43
Lonicera flava	7 10
Lonicera fragrantissima	23 353637 394041 4343a44
Lonicera hildebrandiana	40 44
Lonicera implexa	7
Lonicera japonica	2345678 10 1213 15 1718192021 23 2627 2930 353637 39404141a 4343a4445
Lonicera morrowii	35
Lonicera nitida	36 3839 4141a 4343a444546 48
Lonicera orientalis	5
Lonicera periclymenum	5 17 23 41
Lonicera reticulata	17
Lonicera sempervirens	34 67 10 12 17 21 23
Lonicera tatarica	15 1819 2627 293031 35 37 3940
Lonicera Xbrownii	27 45
Lonicera Xheckrottii	36
Lophomyrtus ralphii	36 44
Loropetalum chinense	41 4343a444546
Lotus berthelotii	2627 2930 36 394041 44
Lotus jacobeus	567 1819

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Luculia grandifolia	4343a44
Luculia gratissima	45 78 25 35 37 39404141a 4343a44 46 48
Lucuma obovata	4
Luma apiculata	10 17
Lycium barbarum	5
Lycium chinense	5 1415 17
Lycium europaeum	6
Lycium ferocissimum	17
Lycium horridum	15 19 21 2930 34
Lygodium scandens	13 151617 1920 40
Lyonia ligustrina	39
Lyonia mariana	15
Maba laurina	45
Macadamia integrifolia	1213 1718 232425262728293031 3536373839404141a424343a444546 4849
Macadamia ternifolia	17
Macadamia tetraphylla	17
Macfadyena unguis-cati	1213 15 1718192021 2324 2627 293031 353637 39404141a 4343a4445 48
Mackaya bella	13 1718 24 2627 293031 353637 39 4141a 43a44 48
Maclura pomifera	2 45 78 10 1415 19 24 2627 32 37
Macrozamia communis	56 10 12 1617 45
Macrozamia miquelii	16 24 2627
Macrozamia pauli-guilielmi	16
Macrozamia spiralis	13 1617 24 44
Magnolia acuminata	4 78 18
Magnolia co'co	4 78 35 37
Magnolia grandifolia	345678 10 1213 15 1718192021 2324252627 293031 353637 39404141a 4343a44
Magnolia heptapeta	2345 78 10 1213 15 171813 2324252627 2930 35 37 46
Magnolia hypoleuca	29 353637 4041 4343a
Magnolia kobus	35 37 40
Magnolia quinquepeta	2345678 10 1213 171819 21 2324252627 293031 46
Magnolia stellata	18 27 2930 35 373839 43 44
Magnolia tripetala	5 13
Magnolia virginiana	5
Magnolia Xsoulangiana	45 78 10 1819 38394041 4343a444546
Magnolia Xthompsoniana	4 78 13
Mahonia aquifolium	6 8 10 23 27 2930 36 45

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Mahonia bealei	8 1213 15 17 41a
Mahonia fortunii	45 78 10 1213 15 171819 21 24 36
Mahonia japonica	78 10 12 18 2627 2930 353637
Mahonia napaulensis	10 13 15 17 19 21
Mahonia nervosa	6
Mahonia pinnata	45
Mahonia repens	5
Malpighia coccigera	18
Malus angustifolia	2627 36
Malus baccata	34 7 16
Malus floribunda	2627 3637 39 44 49
Malus halliana	2627 36
Malus ioensis	36 44 49
Malus prunifolia	5
Malus spectabilis	345 7 2627 41a 444546 49
Malus Xarnoldiana	36
Malus Xatrosanguinea	2627
Malus Xdomestica	12345 78 10 1213 1617181920 2324 2627282930 33 35 37383940 43 444546 4849
Malus Xgorgeous	25 41a 444546 49
Malus Xpurpurea	3637 39 41a 444546 4849
Malus Xscheideckeri	2627
Malvaviscus arboreus	5678 10 15 171819
Mandevilla boliviensis	13 161718 21 2627
Mandevilla laxa	45678 10 12 15 1718192021 232425262728293031 32 36 3839404141a 4343a44
Mandevilla Xamabilis	13 17
Manettia cordifolia	56 8 13 15 1718192021 24 2627 2930
Manettia inflata	21 2627 293031 36 3839404141a 4343a44
Mangifera indica	2 13 1617 23 49
Manilkara zapota	18
Marattia salicifolia	13 17
Marsdenia suaveolens	5
Medicago arborea	6 36
Medinilla magnifica	18 2627 2930
Medinilla teysmannii	16 18
Melaleuca alternifolia	42
Melaleuca armillaris	43a444546

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Melaleuca bracteata	42 45
Melaleuca cheelii	49
Melaleuca decussata	42 45
Melaleuca diosmifolia	2
Melaleuca ericifolia	5 42
Melaleuca fulgens	46
Melaleuca genistifolia	5
Melaleuca gibbosa	45
Melaleuca hypericifolia	5 2627 2930 3536373839404141a424343a44
Melaleuca incana	4546
Melaleuca lanceolata	3839 43 444546
Melaleuca lateritia	36 40 41a 43a
Melaleuca leucadendron	28 3637 39404141a424343a44 49
Melaleuca linariifolia	6 4546
Melaleuca nesophila	4546
Melaleuca nodosa	5 14
Melaleuca pulchella	45
Melaleuca purpuliflora	39
Melaleuca quinquenervia	5 4546
Melaleuca spathulata	46
Melaleuca squamea	6
Melaleuca squarrosa	14
Melaleuca steedmanii	46
Melaleuca styphelioides	5 41
Melaleuca thymifolia	6 14
Melaleuca viridiflora	42
Melaleuca wilsonii	24 2627 293031 353637 404141a 4343a4445 4748
Melastoma malabathricum	5 13 15 171819 21 37
Melia azedarach	23 5678 10 13 1718 2021 2324 262728293031 3536373839404141a424343a44
Melianthus major	3 567 10 37 44
Melianthus minor	3 567 10
Melichrus procumbens	5
Melichrus urceolatus	5
Melicope ternata	2 46
Melictus ramiflorus	2
Menispermum canadense	2627 29

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Meryta denhamii	15 1819
Meryta latifolium	8 13 15 171819
Meryta sinclairii	25
Mespilus germanica	345 78 10 1213 1617181920 2324 2627 2930 33 35 37 3940 49
Metasequoia glyptostroboides.	43a 4546
Metrosideros excelsus	8 1213 15 171819 242526 31 353637 39404141a 4343a 4546 49
Metrosideros kermadecensis	37 39 43
Metrosideros perforatus	43a
Metroxylon vitiensis	16
Metternichia princeps	5 7
Michelia doltsopa	49
Michelia figo	2345678 10 1213 15 1718192021 2324252627 293031 36 3839404141a 4343a444546 49
Michelia fuscata	5
Miconia calvescens	16 18 27
Microcachrys tetragona	5
Microcitrus australis	5
Microcoelum weddellianum	17 20 24252627 3435 37 39
Microkentia gracilis	17
Microlepia pyramidata	2627
Microlepia strigosa	13 16 19
Micromyrtus ciliatus	5
Microsorium scandens	14
Microstrobos fitzgeraldii	46
Mikania scandens	27 38 41
Millettia caffra	41 43a
Millettia megasperma	36
Mimulus aurantiacus	45 78 13 19 24
Mimulus bifidus	21 23
Mimulus glutinosus	15 1819
Mimulus luteus	5 1718
Mimulus puniceus	45 7 15 17
Mimulus repens	6
Mimulus Xhybridus	18 24 2930 38 40 41a
Mimusops elengi	5
Mirbelia rubiifolia	5 14
Mirbelia speciosa	3 5 7

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Miscanthus sinensis	1718 20 23 33
Mitraria coccinea	5 12 26
Mitriostigma axillare	13 15 171819
Momordica balsamina	25
Monotoca elliptica	5 14
Monotoca scoparia	14
Monstera deliciosa	16 2627 2930 3536373839 41 4343a44 48
Monstera friedrichsthalii	44
Montanoa grandiflora	31 36 39 4141a 4343a
Morinda citriodora	12
Moringa pterygosperma	1
Morus alba	123 67 10 13 1617181920 2324 2627282930 3435 37 3940 44 49
Morus nigra	12 567 13 1617181920 2324 2627282930 333435 37383940 44
Muehlenbeckia adpressa	6
Muehlenbeckia axillaris	46 49
Muehlenbeckia complexa	41 43a
Muraltia heisteria	3 567 15 19
Murraya paniculata	5 78 10 13 15 171819 21 2324 2627 293031 3536373839404141a 4343a444546 49
Musa acuminata	4 6 8 1213 1617 24 2627 2930 35 37 39 46
Musa coccinea	30
Musa Xparadisiaca	12 5 10 1213 1617 2324 2627282930 35 37 39
Mussaenda erythrophylla	41 4343a
Mussaenda frondosa	30 3637 394041 4343a 49
Myoporum acuminatum	56
Myoporum debile	5
Myoporum insulare	56 17 41
Myoporum laetum	2 46 48
Myoporum montanum	42 43a
Myoporum parvifolium	6
Myoporum serratum	6
Myrciaria floribunda	6
Myrica cordifolia	6
Myroxylon balsamum	15 1819 31
Myrsine urvillia	6 8
Myrtus communis	1 3 5678 12 15 171819 21 2324 2627 293031 353637 39 41 43
Nandina domestica	3 5678 10 1213 15 17 192021 2324 2627 293031 353637 39404141a 4343a444546 4849

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Napoleona imperialis	5 7
Nematanthus longipes	5 7
Nerium oleander	23 5678 10 1213 15 1718192021 2324252627 293031 3536373839404141a 4343a444546 4849
Nierembergia frutescens	5 37 40 44
Nierembergia gracilis	1718 2627 3940
Noltea africanus	56
Nopalea cochenillifera	3 5 7
Notelaea longifolia	5 14
Notelaea ovata	5 13
Nothofagus cunninghamii	4 7 15 45
Nyssa sylvatica	2 41 43a 4546
Ochna multiflora	21 24 2627 293031 3536373839404141a 4343a44
Odontonema schomburgkianum	8 13 1718 2627
Olea africana	46 49
Olea capensis	6
Olea europaea	23 5 78 10 1213 15161718192021 2324 262728293031 3536373839404141a 43a444546 4849
Olearia argophylla	45678 10 12 1415 1718192021 2627 2930
Olearia asterotricha	6
Olearia avicennifolia	12
Olearia ciliata	6
Olearia frostii	25 45
Olearia glandulosus	6
Olearia myrsinoides	6
Olearia paniculata	45
Olearia pimeleoides	6
Olearia ramulosa	56
Olearia rudis	6
Olearia stellulata	56
Olearia tomentosus	5
Olearia traversii	12 25
Omalanthus populifolius	5 1415 17 41 43a
Opuntia brasiliensis	5
Opuntia curassavica	8
Opuntia decipiens	5 18
Opuntia ficus indica	5 7
Opuntia tomentosa	6

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Opuntia tuna	5
Opuntia vulgaris	56 18
Oreocallis pinnata	42
Orites excelsa	42
Orphium frutescens	56 12
Osbeckia kewensis	41 43a
Osmanthus americanus	45 78 10 13 15 17 20
Osmanthus fragrans	2 56 8 10 1213 15 171819 3536373839404141a 4343a44
Osmanthus heterophyllus	8 10 12 15 171819 21 24 2627 29 31 3536373839 41 43 444647
Osmunda japonicum	21
Osmunda regalis	2627
Owenia venosa	12
Oxera pulchella	13 15 17
Oxydendrum arboreum	36 404141a 43a
Oxylobium arborescens	6
Oxylobium callistachys	5 8
Pachystachys coccinea	45 78
Paeonia officinalis	4 15 18 30 34 36
Paeonia suffruticosa	23 678 10 15 171819 24 2627 2930 35 37
Pagettia medicinalis	12
Paliurus spina-christi	3 5 13
Panax sambucifolium	5
Pandanus baptistii	2627 293031
Pandanus forsteri	20
Pandanus graminifolius	16
Pandanus odoratissima	5
Pandanus pedunculatus	12
Pandanus utilis	8 13 16 18 2627 2930 39
Pandanus veitchii	13 16 18 2021 23 2627 293031
Pandorea jasminoides	345678 10 1213 15 1718192021 2324 2627 293031 353637 39404141a 4343a
Pandorea pandorana	5 8 1314 17 2021 2324 262728293031 353637 39404141a 4343a
Parahebe linifolia	13
Parkinsonia aculeata	6 8 41 42
Parrotia persica	43a44 48
Parthenocissus henryana	27 3536 38394041 4343a
Parthenocissus quinquefolia	10 1213 15 1718192021 2324252627 29 35 37 39 43

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Parthenocissus tricuspidata.	15 1718192021 2324 2627 29303132 353637 39404141a 4343a444546
Passiflora alata	3 567 10 1213 15161718 21
Passiflora alba	567
Passiflora antioquiensis	161718192021 2324252627 29303132 35 37 39
Passiflora banksii	5 8
Passiflora caerulea	5678 13 2021 2324 2627 293031 353637 39 41
Passiflora coccinea	5 7 24
Passiflora edulis	2 567 10 12131415161718192021 232425262728293031323 3536373839404141a 4343a44 46 4849
Passiflora foetida	7
Passiflora herbertiana	45 7
Passiflora incarnata	3 567
Passiflora lutea	26
Passiflora manicata	78 10 1213 15 171819 21 24 2627 293031 353637 39 41 43a
Passiflora mixta	21
Passiflora mollissima	1718 21 24 262728293031 3536373839404141a 4343a44 46 4849
Passiflora pinnatistima	45678 16
Passiflora quadrangularis	5 13 1617 192021 23 2627 2930
Passiflora racemosa	78 10 1213 15 17 19 21 41
Passiflora raddiana	45 7 10 17 21 2627
Passiflora rubra	
Passiflora serratifolia	7
Passiflora suberosa	5
Passiflora trifasciata	13 1718
Passiflora vitifolia	18
Passiflora Xbonaparta	8 15 17 19
Passiflora Xemperess eugene	1718192021 24 26 2930 41
Passiflora Xexoniensis	1718 21 24 2627 2930
Passiflora Xloudoni	5 7
Passiflora Xracemosa/caerul	4 678
Patersonia sericea	31
Paulownia tomentosa	5678 10 13 15 171819 21 2324 2627 293031 353637 3940 44
Pavetta nataliensis	23
Pavonia hastata	18
Pedilanthus tithymaloides	5 7 13
Pelargonium alchemilloides	6
Pelargonium crispum	6

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Pelargonium cucullatum	5
Pelargonium hederifolium	5
Pelargonium peltatum	16 34
Pelargonium Xdomesticum	2 34
Pelargonium Xelkhorn	16
Pelargonium Xhortorum	12 34
Pellaea rotundifolia	1617
Pentas kermesina	13
Pentas lanceolata	4 7 10 13 31 43 49
Pereskia aculeata	56 2627 44
Pereskia grandiflora	36
Periploca graeca	7 10 12 17
Peristrophe lanceolaria	13 16 18
Persea americana	2 8 49
Persea borbonia	45 21
Persoonia hirsuta	5 14
Persoonia lanceolata	2 5 14
Persoonia pinifolia	5 14 42
Petrea volubilis	5 78 10 13 1516 18 41
Petrophila fucifolia	5
Petrophile diversifolia	5
Pharbitis learii	13
Phebalium billardierii	5
Phebalium squamulosum	5 14
Philadelphus brachybotrys	27
Philadelphus coronarius	3 5 78 10 1213 15 1718192021 24 2627 293031
Philadelphus hirsutus	5
Philadelphus inodorus	567 10 13 15 1718192021 24252627 293031 3536373839 4141a 4343a44
Philadelphus lewisii	13 21 24 2627 29
Philadelphus mexicanus	5 8 35 3940 43 44
Philadelphus microphyllus	2627
Philadelphus pubescens	7 10 13
Philadelphus Xfalconeri	
Philadelphus Xnivalis	27 29
Philadelphus Xvirginalis	36 404141a 4343a444546
Phillyrea angustifolia	5 7 14

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Phillyrea latifolia	2 15
Philodendron andreanum	44
Philodendron bipennifolium	43
Philodendron bipinnatifidum	44
Philodendron cordatum	43 44 46
Philodendron erubescens	43 44
Philodendron gloriosum	18
Philodendron imbe	44
Philodendron lundii	44
Philodendron martianum	44
Philodendron ornatum	44
Philodendron scandens	44
Philodendron selloum	444546
Philodendron squamiferum	43 44
Philodendron verrucosum	13 18
Philodendron wendlandii	44
Philotheca salsolifolia	14
Phlogacanthus asperlus	45 7
Phoenix acaulis	1617 24 26
Phoenix canariensis	16 24 2627 3334353637383940 43a444546 48
Phoenix dactylifera	2 567 10 13 1617 20 24 2627 31 34353637 39
Phoenix paludosa	16
Phoenix pusilla	5 16 24 2627
Phoenix reclinata	6 1617 1920 24 2627 34353637 39
Phoenix roebelenii	31 353637383940 44 48
Phoenix rupicola	24 2627 36
Phoenix sylvestris	19 24 2627 31 36
Phormium colensoi	13 15 17 21
Phormium tenax	34567 13 15 1718192021 2324 2627 293031 33 353637 39 4141a 4343a444546
Photinia glabra	5 10 12 15 1819 26 33 363738394041 41a 4343a444546 4849
Photinia serrulata	5 8 10 1213 15 18192021 2324 2627 293031 3536373839404141a 43 4445
Photinia villosa	43a
Phygelius capensis	8 10 20 24 2627 29 37
Phylica pubescens	45
Phyllanthus australis	5
Phyllocladus aspleniifolius	45

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Phyllocladus trichomanoid.	3 5 7 15 17 19 39
Phyllostachys aurea	33
Phyllostachys nigra	4567 10 15 1718192021 24 2627 293031 33 35 37 39
Phyllostachys quiloil	33
Physalis peruviana	56 25 2728 32 48
Physocarpus opulifolius	6 41 43a
Physostelma wallichii	5
Picea abies	4 7 10 12131415 17 192021 24 2627 2930 353637 39404141a 43a
Picea glauca	5 78 10 15 17 46
Picea morinda	4 7 10
Picea orientalis	15
Picea pungens	8 37 39 44 46
Picea sitchensis	42
Picea smithiana	10 15 17 19 21 24 2627 29
Pieris floribunda	10
Pieris japonica	25 27 40 444546
Pieris phillyreifolia	12 15 171819 21
Pimelea ferruginea	5 12 20 4546
Pimelea ligustrina	14
Pimelea linifolia	5 14
Pinus attenuata	17
Pinus canariensis	45 7 10 1213 15 17 192021 2324 262728293031 33 353637 3940 4243
Pinus caribaea	41 42 43a44
Pinus cembroides	4 78 10 15 19
Pinus coulteri	4 7
Pinus gerardiana	4 7 10 17
Pinus halepensis	2345678 10 1213 15 17 19 21 2324 262728293031 353637 39 42
Pinus lambertiana	12 17
Pinus maximinoi	3 7 15 19
Pinus montezumae	4 78
Pinus mugo	5 131415 46 49
Pinus muricata	7 17 21 2627 30 33
Pinus nigra	10 1314 1718 21 23
Pinus palustris	3 6
Pinus patula	42 4546
Pinus pinaster	345678 10 131415 1718192021 2425 282930 35 37 39

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Pinus pinea	1 345678 10 131415 171819 21 2324 262728 31 353637 39
Pinus ponderosa	2 8 10 1213 15 171819 21 2627 2930
Pinus pseudostrobus	45 7 10
Pinus pumila	3 13
Pinus pungens	7
Pinus quadrifolia	12
Pinus radiata	8 10 12 1415 17 192021 232425262728293031 33 353637383940414 1a424343a444546
Pinus rigida	6 13 2627 29
Pinus roxburghii	345678 10 1213 15 17 19 21 24 2627 29
Pinus sabiniana	7 10 13 1718
Pinus strobus	5 8 10 13 15 171819 21 2627
Pinus sylvestris	8 10 1314 1718 2021 2324 2627282930 35 37 39
Pinus taeda	7 26 42
Pinus teocote	4 78
Pinus wallichiana	345 68 10 1213 15 171819 21 27
Piper kadsura	43
Pisonia umbellifera	13 15 171819 24 26
Pistacia chinensis	41 43a444546 4849
Pistacia lentiscus	3 5 7
Pittosporum bicolor	6
Pittosporum buchananii	33
Pittosporum crassifolium	12 1718 2627 29 33 35 37 394041 42 43a444546 48
Pittosporum eugenioides	5 78 10 13 15161718192021 2324 262728293031 33 353637 39404141a 4343a444546
Pittosporum phillyraeoides	6 42
Pittosporum revolutum	4567 10
Pittosporum rhombifolium	37 39 43 444546 48
Pittosporum rigidum	13
Pittosporum rubiginosum	13
Pittosporum tenuifolium	78 1213 1617 21 2324 2627 293031 33 353637 39 4343a 45
Pittosporum tobira	5 7 1213 15 171819 21 2324 2627 2930 37 39
Pittosporum undulatum	5678 12131415 17181920 2324 262728293031 33 3536 39404141a424343a4445 48
Pityrogramma calomelanos	13 17 21 2627
Pityrogramma chrysophylla	13 16 19 21 2627
Pityrogramma pulchella	13 17 20
Pityrogramma sulphurea	13 21
Pityrogramma tartarea	17

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Plagianthus pulchellus	5
Planchonella australis	6 8 1213 1718 42
Planchonella costata	33
Platanus orientalis	5 7 10 13 15 1718192021 24 262728293031 353637 39404141a424343a44 49
Platanus Xacerifolia	23
Platycladus orientalis	4 678 10 1213 15 1718192021 36 404141a 43a 46
Platylobium formosum	5 14
Platylobium obtusangulum	6
Plectranthus discolor	8
Plectranthus ecklonii	18 26 29 373839 41 4343a44
Plectranthus fruticosus	
Plumbago auriculata	5678 10 13 15 1718192021 2324 2627 293031 33 353637 39404141a 43a4445 4849
Plumbago indica	5678 10 12 151617 2627 2930
Plumbago scandens	8
Plumbago zeylanica	5 15 19
Plumeria acuminata	2 21 24 2627 31 35363738394041 4343a444546 4849
Podalyria calyptrata	2 4567 12 3637 3940 41a 43 43a
Podalyria sericea	3 567 41 44
Podocarpus alpinus	46
Podocarpus andinus	3637 39404141a 4343a 4546
Podocarpus dacrydioides	4 7 17 33 43a
Podocarpus elatus	15 17 19 21 24 262728293031 353637383940414 1a424343a44
Podocarpus ferrugineus	2 5 8 13 15 17
Podocarpus macrophyllus	8 13 18 49
Podocarpus montanus	56 8 10
Podocarpus neriifolius	3 6 8
Podocarpus nubigenus	13
Podocarpus spinulosa	56 10 1213 171819 21 24 2627
Podocarpus totara	56 8 13 24 2627 2930 33
Podranea brycei	30
Podranea ricasoliana	17 2021 2324 2627 293031 353637 39 43 44
Polygala chamaebuxus	56 8 15 17 19 33
Polygala myrtifolia	678 12 15 17 43a
Polygala oppositifolia	678 10 15 17 41 43a44
Polygala virgata	3 567 131415 171819
Polygala Xpalmas	15 171819 21 46

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Polygonum cuspidatum	30
Polyosma cunninghamiana	5 7 10
Polypodium acrostichoides	15
Polypodium aureum	13 151617 2627 40
Polypodium brownii	5 17
Polypodium loriceum	15 40
Polypodium punctatum	13 151617
Polypodium pustulatum	13 1516 19
Polyscias filicifolia	16
Polyscias fruticosa	16 18
Polyscias guilfoylei	13
Polyscias murrayi	15
Pomaderris apetala	6
Pomaderris elliptica	56 35
Pomaderris lanigera	56
Pomaderris phylicifolia	6
Poma[illegible] umbellata	5
Populus alba	1213 15 1718192021 23 2627 293031 3637 394041 4343a
Populus balsamifera	12 18 2021 2627 2930 3536
Populus deltoides	36 3839404141a42 4546
Populus nigra	45678 10 1213 15 18192021 2324 2627 293031 35363738 404141a42 43a444546 48
Populus simonii	
Populus tremula	12 15 171819 21 37
Populus trichocarpa	42
Populus Xcanadensis	35 37 3940 43 46
Populus Xrobusta	37 39
Populus yunnensis	37 39404141a 43a 45
Posoqueria multiflora	41 43a
Potentilla nepalensis	6 36 41 43a
Prestonia venosa	4 78
Pritchardia pacifica	17
Prostanthera aspalathoides	45
Prostanthera caerulea	5
Prostanthera cuneata	45
Prostanthera denticulata	5
Prostanthera hirtula	6

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Prostanthera incana	45
Prostanthera incisa	5 41
Prostanthera lasianthos	56 37 3940 43
Prostanthera linearis	5
Prostanthera nivea	6 41
Prostanthera ovalifolia	31 353637 39404141a 4343a444546
Prostanthera sieberi	35 37 39 43a 45
Prostanthera violacea	5 41
Protea cynaroides	2
Protea longifolia	2 43a
Protea mellifera	23 5678 10 12 1718 2021 24 2627 293031 33 353637 3940 41a 44
Protea nana	7
Protea neriifolia	43a
Protea scolymocephala	6
Protea speciosa	5
Protea susannae	43a
Prunus americana	12345678 10 13 1617181920 23 28 32 3435 37383940 444546 4849
Prunus avium	12345 78 10 13 1617181920 2324 2627282930 32 3435 3738 40 44546 4849
Prunus campanulata	41 4546 49
Prunus cerasifera	12 20 23 32 36 404141a 43a44 49
Prunus cerasus	34 7 10 17 2627 37
Prunus domestica	12345 78 10 1213 161718 20 2324 262728293031 3435 37383940 444546 4849
Prunus dulcis	1234567 10 1213 161718 2324 26272829303132 3435 37383940 444546 4849
Prunus glandulosa	1718 2021 2324 2627 293031 3536373839404141a 43 444546
Prunus ilicifolia	7 10 15 17
Prunus insititia	2324 2627282930 33 35 37383940 4546
Prunus japonica	2324 2627282930 33 3536373839404141a 43a 4546
Prunus laurocerasus	2345678 10 1213 15 1718192021 2324 2728293031 343536373839404141a 4343a44 48
Prunus lusitanica	2345 78 1213 15 1718192021 2324 26 28293031 353637 39 41 4343a44
Prunus mume	2627 36 4041 4343a
Prunus padus	2627 29
Prunus persica	12345 78 10 1213 16 181920 2324 2627282930 32333435363738394041 41a 4343a444546 4849
Prunus pseudocerasus	35 37
Prunus salicina	39
Prunus serrulata	40 43 4546
Prunus simonii	23

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Prunus spinosa	16 27
Prunus subhirtella	46
Prunus triloba	24 2627 2930 35 37 3940
Prunus virginiana	2627 29
Prunus Xblireiana	27 293031 353637 39404141a 4343a44 49
Prunus Xpollardii	36 41 43
Pseuderanthemum bicolor 7	16 2627 2930
Pseuderanthemum tuberculatum	13 18 2627 2930
Pseuderanthemum variable 5	
Pseudolarix amabilis 8	
Pseudopanax crassifolium 8	1213
Pseudopanax lessonii	4546
Pseudotsuga menziesii 10	13 17 192021 24252627 2930 37 39
Psidium guajava 1 345 78	1213 1617181920 2324 2627282930 353637 394041 4343a4445 49
Psidium littorale 45678	1213 1617181920 2324 2627282930 32 353637 39404141a 4343a44 48
Psoralea aculeata 6	
Psoralea aphylla 4567	
Psoralea pinnata 56	41 4243 44
Pueraria lobata	28
Pultenaea capitata	14 28
Pultenaea daphnoides 56	14
Pultenaea flexilis	47
Pultenaea stipularis 5	
Pultenaea stricta 6	14
Pultenaea tenuifolia 6	
Punica granatum 12345678 10	1213 15 1718192021 2324 262728293031 353637383940 4141a424343a444546
Pyracantha angustifolia	3637 39404141a424343a444546 48
Pyracantha atalantioides	3637 39 41 43a
Pyracantha coccinea 45678	13 18 23 28293031 35 37 39404141a 4343a 4546
Pyracantha crenulata	21 24 262728293031 34353637 39404141a424343a444546 48
Pyracantha fortuneana	37 39404141a 4343a44 48
Pyracantha rogersiana	36 4041 4343a44 48
Pyrostegia venusta 45 78 10	1213 15 1718192021 2324 2627 293031 353637 404141a 4343a44
Pyrus calleryana	43a44
Pyrus communis 12345 78 10	1213 1617181920 2324 2627282930 3435 37383940 444546 4849
Quercus agrifolia 7	

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Quercus alba	19
Quercus bicolor	4 7
Quercus cerris	345 7 10 15 17 19 27 2930 35 37
Quercus coccinea	4 7 21 24 2627 293031 36 4041 43a44 49
Quercus falcata	7
Quercus ilex	34 678 10 1213 17 20 2627 2930 41 43a
Quercus imbricaria	36
Quercus leucotricophora	4 7
Quercus lusitanica	35 37 39 43a
Quercus macrocarpa	8
Quercus macrolepis	4 7 10
Quercus marilandica	4 7 10
Quercus muehlenbergii	15
Quercus nigra	36
Quercus palustris	4 7 24 2627 2930 353637 39404141a424343a444546 49
Quercus petraea	4 7
Quercus prinus	4 7
Quercus reticulata	4 7
Quercus robur	12345 78 10 13 15 1718192021 2324 2627 293031 353637383940 41a 4343a 49
Quercus rubra	21 24 2627 2930 35 37 3940 43
Quercus suber	2345 78 15 17 21 27 2930 42
Quercus velutina	4 7 10 15 1819
Quercus virginiana	2345 7 12 15 171819 21 24 2627 293031 353637 40 42 43a
Quisqualis indica	45678 10 15 1718 21 23 2627 2930 353637 39404141a 43 44
Randia malleifera	4 7
Rapanea variabilis	56
Raphiolepis indica	5 78 10 1213 15 1718192021 24 2627 2930 3536373839404141a 4343a44
Raphiolepis umbellata	12 1718 2021 24 2627 2930 35 3738 40 41a 43a44
Raphiolepis Xdelacourii	46
Reinwardtia trigyna	78 10 13 15 1819 21 2627 2930 3536373839404141a 4343a444546
Restio australis	5
Restio gracilis	5
Rhagodia hastata	2627
Rhamnus alaternus	345678 26 373839 43 44
Rhapis excelsa	2 1617 19 24252627 34 36 40 43a
Rhapis humilis	24 2627

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Rhodochiton atrosanguineu	5	
Rhodochiton atrosanguineu		25
Rhododendron album	19 21	24 26
Rhodoleia championii		43a 4546
Rhodomyrtus tomentosus	8 12 17	
Rhodosphaera rhodanthema	13 15	
Rhopalostylis baueri	13 1617 1920	24 2627 3435
Rhopalostylis sapida	13 1617 20	24 2627 34
Rhus lucida	5 78	
Rhus succedanea	10 12 15 1819 21	24 2627 293031 33 353637 3940 41a 43 44
Rhus toxicodendron	21	
Rhus typhina		2627
Rhus verniciflua		2627
Ribes aureum	345678 10 1213 161718 20	35 37 3940
Ribes nigrum	8 10 1213 16 18 20	2324 2627282930 32 35 37 3940
Ribes sanguineum	45678 10 16	2627 2930 36 38394041 4445
Ribes sativum	8 12	2324 2627282930 32 40
Ribes speciosum	234 76 10 1213 161718 20	40
Ribes uva-crispa	12 5 8 10 13 161718 20	2324 2627282930 32 35 37 3940 43
Ricinocarpos pinifolius	5 14	28
Ricinus communis	2 56 14	23 2627
Rivina humilis	6 12 15 17	
Robinia hispida	234567 1213 15 17	2627 29 39
Robinia pseudoacacia	345678	2627 2930 35 37 39
Robinia viscosa	1	
Robinia Xambigua		24 2627 29
Rochea coccinea	56 8 13 15 171819	2627 293031 36 40 43a
Romneya coulteri		2627 31
Rondeletia anomala	6 13 15 171819 21	2930 3536373839404141a 4343a444546 49
Rondeletia odorata	45 78 10 1213 15 171819 21	2930 36
Rosa arvensis	34 7	
Rosa banksiae	2 4 7 20	32 46 49
Rosa bracteata	234 7	
Rosa centifolia muscosa	2 20	
Rosa chinensis	2 4 7	
Rosa cinnamomea	3 7	

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Rosa gallica	34 7
Rosa horrida	4 7
Rosa montezuma	7
Rosa moschata	1 34 7
Rosa multiflora	4 7 20
Rosa odorata	3
Rosa roxburghii	4 7
Rosa rubiginosa	1 7
Rosa rubriflora	4 7
Rosa rugosa	20 33
Rosa virginiana	7
Rosa Xalba	4 7
Rosmarinus officinalis	56 8 12131415 181920 2627 293031 3536373839404141a 4343a444546 4849
Rothmannia globosa	13 15 1819 21 2627 293031 353637 39404141a 4343a 48
Rothmannia longifolia	4 7
Roupala macrophylla	8
Royena glabra	6
Royena lucida	15 17 19 21 43
Royena villosa	7
Rubus australis	6
Rubus caesius	
Rubus fruticosus	6 13 161718 2324 2627 2930 40
Rubus idaeus	12345678 10 1213 161718 20 2627 2930 32 35 37 3940 48
Rubus odoratus	5
Rubus phoenicolasius	2324 2627282930 35 37 39 40
Rubus procerus	23
Rubus rosifolius	15 17
Rubus ursinus	5 2324 2627282930 32 35 37 3940 48
Rudbeckia fulgida	25
Rudbeckia hirta	23 25
Rudbeckia laciniata	24 28293031
Ruellia affinis	13 43a
Ruellia coccinea	43a
Ruellia elegans	45 7 18 35 37 39 43
Ruellia herbstii	13 15 171819
Ruellia lorentziana	43a

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Ruellia macrantha	27 2930
Ruellia rosea	18 2627 2930 38 404141a 43a44
Ruellia schauerana	8 13
Rulingia pannosa	5
Ruscus aculeatus	15 1718 21
Russelia equisetiformis	45 78 10 13 15 1718192021 2324 2627 293031 3536373839404141a 4343a444546
Russelia sarmentosa	15 171819 21 2627 41 43a
Ruta graveolens	1 56 8 1314 17
Sabal blackburniana	1617 24 2627 31 35 37 39
Sabal minor	2 13 1617 35 37 39
Sabal palmetto	13 24 2627
Saccharum officinarum	12
Salix alba	18 2627
Salix babylonica	1 34567 13 15 1718192021 2324 2627 2.031 36 4041 43a44
Salix caprea	13 17 21 353637 39404141a424343a444546
Salix chilensis	353637 39404141a 43a4445
Salix coerulea	47
Salix fragilis	4 7 19 36
Salix lasiolepis	
Salix matsundana	42
Salix nigra	43a 4546
Salix phylicifolia	1819 46
Salix purpurea	1819 2627 29
Salix rosmarinifolius	19 49
Salix stipularis	13
Salix triandra	5
Salix viminalis	4 7 13 2627 29
Salix Xmultinervis	42
Salix Xrubra	13 46
Salix Xsepulcralis	
Salix Xsmithiana	36
Salvia argentea	2627 29 23
Salvia aurea	5 13 17
Salvia azurea	8 13 2627
Salvia coccinea	56 8 14 17 242526 36 41 43a
Salvia elegans	24

	1850	1870 -	1880 -	1890 -	1900 -	1910 -	1920 -	1930 -	1940 -	1950 -	1960 -	1980
Salvia farinacea						26			36			
Salvia grahami									36	41	43a	
Salvia involucrata				17	1920	24	2627	29	36		43a	
Salvia leucantha			13	15	17						43a	
Salvia officinalis	1	8	13	14	15	16	1920	24	26	34	40	48
Salvia patens		345678		14	15		1920	23	2526272829	33	36	43a
Salvia roemerianana							19					
Salvia splendens		345 8	13	15	171819		23242526272829			34		48
Salvia uliginosa											36	43a
Salvia Xbonfire								28				
Salvia Xsuperba		5										
Sambucus gaudichaudiana		6										
Sambucus nigra		2345678 10	13		17	2021	2324	2627	293031	353637	39 4141a	4343a 45
Sambucus racemosa				15	171819							
Sanchezia nobilis			13									
Santalum acuminatum		5										
Santalum album		5										
Santolina chamaecyparissus												
Sapindus marginatus		4 7								36	41	43a
Sapindus saponaria		5										
Sapium sebiferum		45 7										
Sarcococca hookerana										36	404141a	43a444546
Sassafras albidum		8										43a
Saxegothaea conspicua		78 10	13		17							
Scaevola aemula		6										
Scaevola albida		5										
Scaevola calendulacea		56										
Scaevola koeningii		5										
Schaveria flavicoma		5	13	15		19						
Schefflera venulosa												
Schima wallichii												4445
Schindapsus pictus				16	18						43a	
Schinus molle		45		15	1718192021		232425262728293031	33	353637383940	4141a	424343a	44 444546 49
Schinus polygamus		4 7										
Schinus terebinthifolia		4 7										
Schizaea bifida		5			17					41	43a	

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Schizaea rupestris	5
Schotia afra	45 78
Schotia latifolia	3456 26
Sciadopitys verticillata	10 12 2627
Scolopia brownii	30 41
Selenicereus grandiflorus	67 15 1819 24
Selenicereus macdonaldiae	15 1819
Selenicereus pteranthus	6
Selenicereus spinulosus	
Selliera radicans	6
Senecio cinerea	7 43a
Senecio crassiflorus	
Senecio ficoides	36
Senecio petasitis	36 3839 41 4343a
Senecio serpens	36
Sequoia sempervirens	45 78 10 12 15 171819 24 33 3940 43a
Sequoiadendron giganteum	6 8 10 12 15 17181920 2324 262728293031
Serissa foetida	12 18
Sesbania grandiflora	7
Sesbania punicea	5
Sesbania tripetii	3233 353637383940
Shepherdia argentea	45 78
Sibiraea laevigata	7 10
Smilax australis	56 14
Smilax glauca	78
Smilax glycophylla	5 14 28
Solandra grandiflora	8 1213 15 1718 24 2627 2930 36
Solandra longifolia	8 10 1213 15 1718 30
Solandra maxima	35363738 404141a 43 4445 47
Solanum aviculare	6
Solanum capsicastrum	13
Solanum giganteum	6
Solanum jasminoides	4567 10 13 15 1718192021 2324 2627 293031 33 353637 39 4141a 4343a
Solanum pseudo-capsicum	6
Solanum quercifolia	6
Solanum seaforthianum	21 24252627 293031 33 353637 39 41

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Solanum simile	6
Solanum wendlandii	24 2627 293031 33 353637 394041
Sollya heterophylla	56 8 15 17 19 21 24 2627 2930 4041 46
Sophora japonica	345678 13 1819 2627 29 41 43a
Sophora tetraptera	345678 12 15 171819 21 242526 282930 353637 39 41 4343a
Sorbaria grandiflora	15 171819 21 2324 2627 29 31
Sorbaria sorbifolia	17 21
Sorbus aucuparia	4 67 10 15 1819 21 24 2627 293031 353637 3940 4343a 4546 4849
Sorbus domestica	23 2627 36
Sowerbaea juncea	28
Sparmannia africana	345 78 17 2021 2324 2627 29 3637
Spartium junceum	56 20 24 26272829303135363738394041a 43a444546 48
Sphaeropteris cooperi	6 13 151617 192021 2627 40 46
Sphaeropteris medullaris	2627
Spiraea bella	10 13 23
Spiraea blumei	10 18 21 24 2627 404141a
Spiraea canescens	6
Spiraea cantoniensis	13 17 2021 2324 2627 293031 35 37383940 41a 4343a444546
Spiraea corymbosa	345678 10 13 15 1718192021
Spiraea densiflora	24
Spiraea douglasii	5678 10 13 15 1718192021 2324 2627 29 31 35 37 3940 43 44
Spiraea gracilis	21 2627 41 43
Spiraea hypericifolia	78 10 23 2627 29 9 10 11
Spiraea japonica	6 13 1718 20 24 2627 293031
Spiraea prunifolia	45678 10 13 15 1718192021 23 2627 29 35 37 39 41 43
Spiraea salicifolia	13
Spiraea thunbergii	46
Spiraea tomentosa	4 7
Spiraea Xbumalda	21 2324 2627 293031 35 373839 4343a44
Spiraea Xcalifornica	21 2627 29 36 41
Sprengelia incarnata	56 14 25
Sprengelia ponceletia	5
Stachytarpheta mutabilis	5 7
Stemona tuberosa	4 7
Stenocarpus cunninghamii	5 8 10 1213 15 1718192021 2627 293031
Stenocarpus salignus	2 15 171819 42

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Stenocarpus sinuatus	6 3536373839404141a42 43a4445
Stephanandra incisa	35 43 45
Stephanotis floribunda	4567 10 1213 15161718192021 2324 2627 293031 353637 39404141a 4343a 4546
Stephanotis thouarsii	5 17
Stigmaphyllon ciliatum	5 8 10 1213 15 1718192021 2324 2627 293031 3536 38 404141a 43a
Stokesia laevis	24 2930 37
Stranvaesia davidianna	36 43a
Strelitzia alba	2 456 16 18 21 2324 2627 31 3536 43a44
Strelitzia nicolai	49
Strelitzia reginae	45 8 10 13 161718 21 23 27 29 31 3637 40 41a 43a444546 48
Streptosolen jamesonii	1213 15 1718192021 24 26272829303l 33 3536373839404141a 4343a444546 49
Strobilanthes anisophyllus	45 78 10 1213 15 171819 21 2324252627 2930 3536373839404141a 4343a444546
Strobilanthes dyeranus	27 2930 44
Strobilanthes glomeratus	45 78 13 18 24 26
Strobilanthes isophyllus	5 45
Strophanthus speciosus	15 171819 24 26272829 31 353637 39
Styphelia laeta	5
Styphelia longifolia	5
Styphelia trifolia	23
Styphelia tubiflora	5
Styphelia viridis	5 14 28
Styrax japonicus	2627 46
Styrax obassia	26
Styrax officinalis	2627
Sutherlandia frutescens	2345 78 18 25
Swainsona galegifolia	56 13 15 171819 2627 33
Swainsona greyana	56 10 15 17 21 42
Symphoricarpos acutus	37 39
Symphoricarpos albus	8 18 2324 2627 29 36 38 404141a 43a44
Symphoricarpos orbiculatus	8 12 18 37 394041 4343a44
Syncarpia glomulifera	1415 171819 21 2324 262728293031 353637 39404141a 4343a44
Syngonium angustatum	16
Synoum glandulosum	7
Syringa reticulata	17 23
Syringa vulgaris	345678 10 13 15 1718192021 2324 2627 293031 33 3536373839404141a 4343a44 46 4849
Syringa Xchinensis	36

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Syringa Xhyacinthiflora	23
Syringa Xpersica	4567 10 13 1718 20 2324 2627 2930 33 35 37 39
Syzygium aqueum	12
Syzygium coolminianum	27 39
Syzygium floribundum	5 27 353637 39404141a
Syzygium jambos	12 10 1213 15 1718192021 24 26272829 31 35 37
Syzygium luehmannii	30 353637 39 4141a 43a
Syzygium malaccense	4 7
Syzygium paniculatum	5 8 1213 15 171819 23 252627 2930 3637 42
Tabebuia heptaphylla	8
Tabebuia rosea	161718
Tabernaemontana dichotoma	2 45 18
Tabernaemontana divaricata	12
Tamarindus indica	567 13 17
Tamarix aphylla	41a 43 48
Tamarix chinensis	12 20 1112 353637 39404141a 4343a44
Tamarix gallica	10 1213 1718 20 2324 2627 293031 353637 39404141a 4343a44
Tamarix ramosissima	35 40 4343a
Taxodium distichum	2 4567 10 15 1718192021 2627 2930 353637 39 41 4343a4445 49
Taxodium mucronatum	4 7
Taxus baccata	45 78 10 13 15 1718192021 2324 2627 293031 33 35 37 3940 43a44
Tecoma alata	21 2324 2627 2930 353637 39 4141a 4343a
Tecoma fulva	12 15 17 19
Tecoma garrocha	41 43a
Tecoma stans	45678 10 1213 15 1718192021 2324 2627 293031 3536373839404141a 4343a44
Tecomanthe speciosa	6
Tecomaria capensis	2 45678 13 15 1718192021 36 404141a 43a 48
Tectaria moorei	13 17
Telopea speciosissima	2 45 78 10 12131415 1718 20 24 28293031 353637 3940 41a4243 444546 48
Templetonia glauca	7
Templetonia retusa	6
Tephrosia capensis	5 8
Tephrosia grandiflora	5
Tetrapanax papyrifera	8 1213 15 1718192021 24 262728
Tetratheca ciliata	6
Tetratheca ericifolia	5

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Tetratheca juncea	5
Tetratheca pilosa	6
Teucrium chamaedrys	43a
Teucrium fruticans	43a
Thelypteris dentata	5 13 15 17 19 21
Thelypteris pennigera	13 15 17
Thespesia lampas	6
Thevetia peruviana	5
Thryptomene calycina	45
Thryptomene saxicola	43a 45 47
Thryptomene Xpaynee	43a 45 47
Thuja occidentalis	5678 13 17 21 24 262728293031 33 36 404141a 43a444546 49
Thuja plicata	8 1213 15 17181920 2425262728293031 33 36 41 43a444546 49
Thujopsis dolabrata	8 10 1213 15 1718192021 24 262728293031 33 353637 39 41a 4343a 45
Thunbergia alata	34567 161718192021 2324
Thunbergia coccinea	5 78 1213 151617 19 2627 29 36
Thunbergia erecta	8 10 1213 15161718 21 26
Thunbergia fragrans	7 27 29
Thunbergia grandiflora	5 13 16 18 39 41 4343a
Thunbergia gregorii	31 3536373839404141a 4343a44 48
Thunbergia hawtayneana	2627
Thunbergia laurifolia	8 1213 1516171819 21 23 2627 293031 36 404141a
Thunbergia mysorensis	27
Thunbergia vogeliana	16
Thymus herba-barona	43a
Thymus richardii	36 41 43a
Thymus serpyllum	36 41 43a44
Thymus vulgaris	1 6 8 1314151617 1920 24 34 40 4849
Thymus Xcitriodorus	1314 1617 19 2324 36 41 43a
Tibouchina bicolor	46
Tibouchina granulosa	13 18 21 23 46
Tibouchina heteromalla	4 10 15 17 2627
Tibouchina laxa	13
Tibouchina semidecandra	13 18192021 2324 26 293031 3536373839 4141a 43 4445 47
Tibouchina urvilleana	2324 2627 293031 33 35 37383940 4343a444546
Tieghemopanax elegans	15 17

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Tilia platyphyllos	6 2627
Tilia tomentosa	2627
Tilia Xeuropaea	345 8 10 13 15 171819 21 24 2627 31 35 37 39
Todea barbara	5 13 151617 1920 2627
Toona australis	2 6 8 1718 21 40 42
Torreya californica	8 10 13
Torreya nucifera	5 15 17
Torreya taxifolia	10
Trachelospermum jasminoides.	7 10 1213 15161718192021 23 2627 293031 33 3536373839404141a 4343a444546
Trachycarpus fortunei	1617 2627
Trachycarpus martianus	17
Tremandra stelligera	5
Trichocereus chiloensis	78
Trichomanoides reniforme	1516
Triplochlamys multiflora	16 18
Tristania conferta	5 8 10 1213 18 20 24 262728293031 353637 39404141a424343a444546
Tristania laurina	5 2627 29 41 42 43a 4546
Tristania neriifolia	5 1415 1819
Tropaeolum speciosum	2627
Tsuga canadensis	43a
Tsuga dumosa	7
Turnera ulmifolia	7
Tweedia coerulea	4 678 2627 40
Tylophora barbata	5
Ugni molinae	8 10 12 15 171819 23 45
Ulex europaeus	1 56 8 14 4141a 4343a444546
Ulmus americana	36 40
Ulmus carpinifolia	17
Ulmus glabra	345678 15 171819 23 35 37 49
Ulmus laevis	8
Ulmus parvifolia	345 78 10 1213 15 171819 21 2324 2627 2930 353637 39404141a 4343a444546
Ulmus procera	2345 7 10 1213 15 1718192021 2324 2627 293031 353637 3940 43a444546
Ulmus thomasii	4 7 18 2324 2627 293031 37
Ulmus Xhollandica	35 37 39 44
Ulmus Xvegeta	17 2627 2930 36
Veronica vernicosa	36

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Verticordia brownii	56 12 15 17
Verticordia plumosa	5
Viburnum carlesii	
Viburnum davidii	30 3637 3940 41a 43 4445
Viburnum dilatatum	46
Viburnum japonicum	345678 10 13 40 41a
Viburnum lantana	4141a 43
Viburnum macrocephalum	45 7 10 15 17 21 23 27 2930 40 4445
Viburnum nudum	35 37 39 41 43a
Viburnum obovatum	15 19
Viburnum odoratissimum	45 78
Viburnum opulus	345 78 10 1213 15 171819 21 2324 2627 2930 35 41 43a 48
Viburnum plicatum	45 78 10 1213 15 1718192021 2324 2627 293031 33 3637 39404141a 4343a44 46 4849
Viburnum prunifolium	4 78 10 1213 18 21 24 27 2930 33 3637 39 4343a4445
Viburnum rhytidophyllum	40
Viburnum rigidum	3637 39404141a 4343a44
Viburnum sieboldii	2345 78 10 13 17
Viburnum suspensum	171819 24 2627 29 33 39
Viburnum tinus	8 10 13 15 171819 21 2324 2627 293031 353637 39404141a 4343a4445
Viburnum Xburkwoodii	2345678 10 1213 15 1718192021 2324 2627 293031 353637 39404141a 4343a 4546 48
Viburnum xcarlcephalum	4141a 4343a4445
Viburnum Xjuddii	43a 4546 49
Vigna caracalla	7 15 18192021 2324252627 293031 43a
Viminaria juncea	35 37 39404141a 43 44
Vinca major	6 14
Vinca minor	4 67 10 13 16 18 2324 29 35 37 39 43
Virgilia capensis	345678 10 14 1718 24252627 29 36 41 43a 49
Vitex aestivalis	4 678 12 2930 353637 39404141a 4343a444546
Vitex agnus-castus	5
Vitex trifolia	45 78 10 13 15 1718192021 4141a 4343a4445
Vitis coignetiae	18 21 24 2627 39 43 4445
Vitis labrusca	37 39
Vitis thunbergia	45 7 24
Vitis vinifera	2627 29
Vitis vulpina	12345 78 10 13 161718 20 2324 2627282930 32 3435 37383940 444546 4849
Washingtonia filifera	4 7
	1617 24 2627 3435 37 3940

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
Washingtonia robusta	31 36 43a
Weigela coraeensis	8 10 13 15 1718192021 2324 2627 2930 36 39404141a 43 44
Weigela floribunda	13 21 24 2627 293031 353637 39404141a 4343a44
Weigela florida	45678 10 1213 15 171819 21 2324 2627 293031 33 353637 39404141a 4343a 4546
Weigela hortensis	15 1819 21 2627 49
Weigela middendorffiana	17
Weigela praecox	2627 293031 3637 39 4141a 4343a44454
Weigela Xbristolruby	44
Weigela Xnewport red	43a4445 47
Weigela Xstelzneri	29 31 39
Weigela Xstyriaca	36 4041 43a44
Weigela Xwagneri	13
Westringia dampieri	5
Westringia fruticosa	4546
Westringia glabra	4546
Westringia longifolia	5
Westringia rosmariniformis	56 14
Widdringtonia cupressoides	12 15 19 21 24 36 4141a 4343a44 4849
Widdringtonia juniperoides	
Wigandia caracasana	1718 23
Wisteria brachybotrys	26 33
Wisteria floribunda	24 2627 293031 33 353637 3940 4546
Wisteria frutescens	45 8 1314 17 21
Wisteria macrostachya	1516 19 2627 29 31
Wisteria megasperma	13 1516171819
Wisteria sinensis	2 45678 10 1213 15161718192021 2324 2627 293031 3536373839404141a 4343a4445
Woodwardia orientalis	13 19
Woollsia pungens	5 14 28
Xanthorrhoea arborea	5
Xanthorrhoea australis	14
Xanthorrhoea bracteata	5
Xanthorrhoea minor	5 14
Xanthorrhoea preissii	6
Xanthorrhoea resinosus	5 28
XCrataego-mespilus gran.	7
XFatshedera lizei	4546

	1850 - 1870 - 1880 - 1890	1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1980
XHelioporus smithii	78 15 171819	
Xylomelum pyriforme	5 14	36 404141a
Xylosma congestum		
Yucca aloifolia	12345C78 13 1516171819	21 2324 2627 2930 36 39 47
Yucca filamentosa	345678 12 15 171819	21 24 2627 2930 36 39
Yucca gloriosa	345678 1213 15 171819	21 2627 33 4546
Yucca recurvifolia	1819	21 2324 2627 2930
Zelkova serrata		
Zieria arborescens	6	45 49
Zieria cytisoides		
Zieria smithii	5 14	4546
Ziziphus jujuba	5	
Ziziphus paliurus	45 7	
Zygophyllum foetidum	5	
Zygophyllum sessilifolium	5	

Appendix 2(a) List of catalogues and sources used to gauge Adelaide's history of woody ornamental planting.

1. William Macarthur	General Catalogues (N = 651)	1843, 1847, 1850, 1857
2. C.M. Ware	Advertisement 1st Ed. Advertiser. (N = 36)	8 July 1858
3. John Bailey	The Adelaide Observer. (N = 203)	3 May 1845
4. Mr George McEwin	Catalogue of plants grown at Melbourne Cottage, North Adelaide by G Stevenson. (N = 96)	1849
5. Evandale Nursery	General catalogue.(N = 86)	1860
6. F.C. Davis Moore Farm Reedbeds near Adelaide.	Plants, trees, roses, vines etc. For sale. (N = 195)	1862
8. E. & W. Hackett	Catalogue of flower seeds and sundries. (N = 32)	1878
9. Henry Sewell Payneham Nursery	Descriptive catalogue of new, rare and beautiful plants, also ornamental trees and shrubs. Choicest florists flowers, ferns, palms, greenhouse and stove plants, climbers, fruit trees etc. (Catalogue incomplete N = 211)	1880
10. Forest Board	Catalogue of trees at the different nurseries. In The Garden and the Field. (N= 33)	March 1882
11. Pascoe, John	Seed catalogue. Korra Weera Nursery, West Marden & East-end Market, Adelaide Issued as Supplement to The Garden and Field. (N = 13)	April 1886
12. Smith, Edwin	General descriptive catalogue of plants, trees, shrubs etc. (N = 464)	1885-1886
13. Sewell, Henry	General catalogue. Payneham Nurseries & 50 Arcade, Rundle St., Adelaide, S.A (N = 783)	1888
14. Woods & Forests Dept., Belair.	Stock list. (N = 16) (R. Swinbourne unpub. report).	1893
15. G.F. Newman & Son	General catalogue. (N = 34) 17 Rundle St., Adelaide and Model Nursery, Houghton, S.A.	1893 largely incomplete
16. Hackett, E. & W.	Illustrated Manual for the Garden and Farm with a descriptive catalogue, seeds, plants etc. 5th Ed. 78 Rundle St., S.A. (N = 266)	1898 half complete
17. Wicks, H.	Catalogue of fruit trees, vines etc. Riverside Nursery, Payneham, S.A. (N = 32)	1904
18. Sewell, Henry	Catalogue general seeds & plants. Payneham Nursery, Payneham. Seed Warehouse Beehive Cnr., Adelaide. (N = 1030)	1906/1907
19. Wicks, H.	Catalogue of fruit trees, vines etc. Nurseries Riverside & Balhanna, S.A. (N = 30)	1910
20. Hackett, E. & W.	Seedsmen & Nurserymen catalogue. 73 Rundle St., and Marryatville, S.A. (N = 784)	1912

22. Lewcock, W.G. & Sons	General catalogue seeds, plants etc. illus. Hartley Spring Gdns&Main St., Clare, S.A. (N = 87)	1914/1915
23. Lasscock, E.A.	E.A. Lasscocks rose & miscellaneous catalogue. (N = 31) Lockleys, Port Adelaide & Central Market.	1918
24. Sewell's, Henry	Plant catalogue. Payneham Nurseries, Payneham, Aldgate & West Marden, S.A. (N = 1002)	1920
25. Woods & Forests Dept., Belair.	Annual catalogue of tree. (N = 26)	1921/1922
26. Harris, Scarfe Ltd.	Roses, fruit trees, seeds, bulbs, shrubs, plants. (N = 155)	1926
27. Lasscock's Nurseries	Catalogue roses, shrubs, trees, fruits, climbers, plants, seeds etc. Mellor Park, Henley Beach Rd., Lockleys, Pt.Adelaide & Glenelg, S.A. (N = 281)	1927
28. F.W. Bowels	General catalogue. Payneham Nursery, Payneham, S.A. (N = 587)	1920's
29. Hackett, E. & W. Ltd.	Illus. catalogue, Adelaide, S.A. (N = 407)	1930
30. Woods & Forest Dept., S.A.	Catalogue of trees for distribution. Adelaide, S.A. (N = 44)	1934
31. Lasscock's Nurseries	General seed & plant catalogue. Lockleys, S.A. (N = 299)	1937
32. Harris, Scarfe Ltd.	Catalogue of roses, shrubs, fruit trees, plants etc. Grenfell St., Adelaide, S.A. (N = 577)	1938
33. Kemps Nurseries Ltd.	Catalogue of roses etc. Unley, S.A. (N = 650)	1940
34. Hackett, E. & W. Ltd.	Illus. catalogue of vegetables, fruit etc. 77 Rundle St., Adelaide & Millwood Estate, (N = 407)	1940
35. Kemps Nurseries	Price list. Unley, S.A. (N = 203)	1948
36. Kemps Nurseries	Catalogue of roses, trees, shrubs, climbers, plants, fruit trees, vines etc. Kingswood, Mitcham, Aldgate, S.A. (N = 473)	1950
37. Woods & Forests Dept., S.A.	Nursery stock price list. Adelaide, S.A.	May 1958
38. Lasscocks	Shrubs, roses, trees & indoor plants. Henley Beach Rd., Lockleys, S.A. (N = 332)	1958
39. Kemps Nurseries	Catalogue of roses, trees, shrubs, climbers, fruit trees, vines etc. Kingswood, Mitcham, Aldgate, S.A. (N = 385)	1960-1961
40. Newman, C.F. & Son	Camellias, native/rare plants catalogue. Main North East Rd., Tea Tree Gully S.A. (N = 82)	1964
41. Thomson, David M.	Dwarf conifers, alpine/rock plants, perennials/dwarf shrubs. (N = 172) Mount View Garden, Summertown, S.A	1968-1969
42. Lasscocks P/L	Wholesale price list. Henley Beach Rd., Lockleys, S.A. (N = 334)	1969

43.	Heyne's Nurseries Pty. Ltd.	Winter catalogue (general). Kensington Nurseries, 287-289 The Parade, Beulah Park, S.A. (N = 47)	1971
44.	Engel, Peter	Ornamental tree & shrub catalogue. Main North Rd., Salisbury, S.A.(N = 340)	1971
45.	Kemps Nurseries	Catalogue of Aust. native trees, shrubs, climbers. Kingswood, Aldgate, S.A. (N = 371)	1975
		Catalogue of garden information. Kingswood, Aldgate, S.A.	1975
		Catalogue roses and fruit trees.	1975
46.	Woods & Forest Dept.	List of Nursery stock. (N = 234) Belair, Adelaide, S.A.	1975
47.	Newman Nursery	Camellia, erica & general catalogue. Tea Tree Gully, S.A. (N = 178)	1982
		Wholesale plant lists Tea Tree Gully, S.A.	1984
48.	Lasscocks P/L	Wholesale plant lists. (N = 208) Henley Beach Rd., Lockleys, S.A.	1983

Catalogues within personal collection of Robert Swinbourne or as sourced by Swinbourn (1980).

APPENDIX 2(b): STOCK LISTS OF THE ADELAIDE NURSERIES STUDIED: 1845 - 1980

Note: Numbers in table correspond to numbering of nurseries in Appendix 2(a)

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
+Laburnocytisus adamii	1213 33 36 39
Abarema sapindoides	13 18 24
Abelia chinensis	1 12 20 24 2627 29 31 34 38 42 44
Abelia floribunda	1 39
Abelia schumannii	32 34 36 3839 41 44
Abelia uniflora	12
Abelia Xgrandiflora	48
Abelmoschus manihot	1 4 9 1213 18 24 28
Abies alba	3 18 20 24 3233
Abies amabilis	33
Abies balsamea	1 13 18 41
Abies cephalonica	1 18 24
Abies concolor	24
Abies fraseri	18 24 33
Abies grandis	18
Abies homolepis	24
Abies nordmanniana	13 18 20 24 3233 36 39
Abies pindrow	33 36
Abies pinsapo	1 13 18 20 24 3233 36 39
Abies procera	1
Abies procera	1 18 20 38 44
Abies religiosa	1
Abies sibirica	24
Abies spectabilis	1 13 18 20
Abrus precatorius	1 16 18
Abutilon bedfordianum	1
Abutilon darwinii tessel.	12
Abutilon golden fleece	20 24 29 34
Abutilon hybridum	20 24 29 323334 38 42 44
Abutilon megapotamicum	20 24 32
Abutilon pictum	12 20 24 29 3334 44
Abutilon sellowiana	12 18

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Abutilon vesuvius	20 24 3233
Abutilon XboutedeNiege	12 24 29 34
Acacia accola	46
Acacia adunca	24
Acacia aneura	24 46
Acacia armata	8 1516 18 20
Acacia baileyana	16 18 2022 24 2627 293031323334 3637383940 42 444546 48
Acacia brachybotrya	37 46
Acacia buxifolia	24
Acacia calamifolia	37 46
Acacia cultriformis	16 18 20 29 3334 42 4445
Acacia cyanophylla	24 37 48
Acacia cyclops	37 46
Acacia dealbata	16 18 20 24 2627 29 31323334 3637383940 42 444546
Acacia decora	24 29 36
Acacia decurrens	12 16 18 20 24 27 293031323334 3637 39 46
Acacia difformis	24
Acacia drummondii	40 4546 48
Acacia falcata	24
Acacia farnesiana	1
Acacia fimbriata	46
Acacia floribunda	1 12 20 24 29 3233 48
Acacia glandulicarpa	46
Acacia glaucescens	2 18
Acacia homalophylla	24
Acacia horrida	3
Acacia iteaphylla	18 42 444546 48
Acacia juncifolia	18 24 37
Acacia juniperina	16 20 40 46
Acacia leprosa	5
Acacia linifolia	1 16 20 24 29 32
Acacia longifolia	16 18 20 24 2627 29 3132 34 36 3940 42 444546
Acacia longissima	16 20 29
Acacia mearnsii	16 18 20 24 29 31 3334 39
Acacia melanoxylon	12 16 18 20 24 29 3334 36 46
Acacia myrtifolia	16 18 24

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Acacia nilotica	3
Acacia notablis	46
Acacia obtusata	24
Acacia oswaldii	46
Acacia oxycedrus	24
Acacia panniculata	1 16 20 24 29 32
Acacia papyrocarpa	37 46
Acacia pendula	1 24 29 4546
Acacia penninervis	24
Acacia podalyriifolia	20 24 2627 29 31323334 3637383940 42 444546 48
Acacia pravissima	45
Acacia prominens	20 24 36
Acacia pruinosa	29 3233 36
Acacia pycnantha	1516 18 20 24 2627 29 31323334 363738 42 444546
Acacia retinodes	20 46
Acacia rotundifolia	16 46
Acacia rubida	1 45
Acacia salicina	37 46
Acacia saligna	5 16 20 24 29 323334 3637 39 42 444546
Acacia spectabilis	20 24 36 40 46
Acacia stenophylla	46
Acacia stricta	24 33
Acacia suaveolens	1 16 18 20 24 29
Acacia terminalis	46
Acacia trineura	46
Acacia verniciflua	46
Acacia vestita	46
Acalypha hispida	18 20 24
Acalypha wilkesiana	13 18 24
Acanthopanax spinosus	24 28
Acer campestre	12 20 24 3233 35
Acer cappadocicum	33 35
Acer negundo	1 12 20 3233 3536 3839 41
Acer palmetum	20 24 3233343536 3839 4142
Acer platanoides	1 3 24 3233
Acer pseudoplatanus	1 10 12 14 20 24 3233 353637 39

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Acer rubrum	3233 36 39
Acer saccharinum	1 33 36
Acer saccharum	14 33
Acmena smithii	1 12 16 20 24 2728 31323334 36373839 42 4445464748
Acokanthera oblongifolia	13 20 24 272829 313233343536 38 45
Actinidia chinensis	39 43 45
Adansonia digitata	1
Adenandra uniflora	1 1213 18 20 24 28 4142
Adenanthera pavonia	1
Aeschynanthus boschianus	1
Aeschynanthus longiflorus	1
Aeschynanthus marmorata	1
Aeschynanthus parasiticus	1
Aeschynanthus pulcher	1
Aesculus hippocastanum	1 3 12 20 24 3233 3536 39 45
Aesculus indica	33
Aesculus octandra	12
Aesculus Xcarnea	1 12 24 3233 3536
Agathis australis	12 5 13 16 24 28
Agathis robusta	6 13 20
Agathosma corymbosa	41
Agathosma pulchella	3233343536 3839
Agave americana	1 34 9 1213 20 3233
Agave palmeri	13
Agonis flexuosa	12 20 24 33 353637383940 42 45464748
Agonis juniperina	40 42
Ailanthus altissima	1 5 12 20 24 29 32 37
Ailanthus excelsa	5
Akebia quinata	18 20 24 28 3233
Albizia distachya	1 3 16 18 20 24 29 3334 48
Albizia julibrissin	33 3536
Alectryon excelsus	12 24
Allamanda cathartica	1 6 13 18 24
Allamanda neriifolia	1 6 13 20
Allamanda violacea	13
Allamanda Xchelsonii	24

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Alnus glutinosa	12 24 32 42
Alnus incana	42
Alnus jorullensis	42 48
Aloe arborescens	3 9 13
Aloe ferox	9 13
Aloe plicatilis	6 9 13
Aloe saponaria	34 6 9 13
Aloe striata	13
Aloe succotrina	9 13
Aloe Xprincipis	3233
Aloysia triphylla	1 3 12 2022 24 26272829 313233343536 3839 42
Alpinia zerumbet	13
Alsophila australis	16
Alsophila excelsa	13 16 18 20
Alsophila leichhardtiana	16
Alsophila smithii	9
Alstonia scholaris	1 9 16
Alyogyne huegelii	12 28 46
Amelanchier canadensis	1 24 3233 3536 45
Amicia zygomeris	1
Amorpha fruticosa	1 3 20
Ampelopsis aconitifolia	18 24
Ampelopsis brevipenduncu.	24 28
Andromeda polifolia	41
Anemopaegma chamberlaynii	8 13 18 24
Angophora cordifolia	1 18 20 28
Angophora costata	3637 42 4546 48
Angophora floribunda	18 20 29
Angophora subvelutina	16 20 29
Annona cherimola	1 34
Annona glabra	1
Anopterus glandulosus	12 24
Anthocercis viscosa	12 16 20
Anthyllis barba-jovis	1 24 28
Antigonon leptopus	13 1516 20 28 313233 3536 3839 42 4445
Aphanopetalum resinosum	1213 20 24 28

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Aphelandra squarrosa												47
Aphelandra tetragona	1											
Araucaria angustifolia	1											
Araucaria araucana	12	56	13		18		24	28	33	36		
Araucaria bidwillii	1	56	13		18	2022	24	30	3233	36		
Araucaria columnaris	1	56			18	20						
Araucaria cunninghamii	123456		13		18	20	24	28				
Araucaria heterophylla	123456		13		18	2022	24	272829	313233343536	3839	42	444546 48
Araucaria rulei			13									
Araujia sericifera			13		18	20	24	28				
Arbutus andrachne	1											
Arbutus canariensis			12			20	24	2627				
Arbutus unedo	1		12			20	24	26272829	313233343536	3839	42	4445 4748
Archontophoenix alexandr.			13			20						
Archontophoenix cunningh.	1		13		18	20	24	26	33		44	
Arctostaphylos uva-ursi										41		
Ardisia crenata	1	5	1213	16	18	20				39		48
Ardisia crispa			12									
Arecastrum romanzoffianum			13		18	20	24	28	323334		44	48
Aristolochia elegans					18	20		29	3233343536			45
Aristolochia fimbriata			1213			20	24					
Aristolochia labiosa			1213		18		24					
Aristolochia sempervirens	1		1213		18		24					
Aristolochia triloba			13				24					
Artabotrys hexapetalus	1											
Artemisia abrotanum	1	34	13		18	20						
Artemisia vulgaris		3	13									
Artocarpus cannonii			13	16	18							
Arundinaria humilis					18							
Arundinaria variegata			1213		18		24	28	3233			
Arundinaria viridistriata												
Arundo donax		34	1213		18	20	24	2829	3233			
Asarina barclaiana	1	3 68	13	15	18	20	24	272829	3334			
Asarina erubescens	1				18	2022	24	27 29 31				
Ascelpias fruticosa	1											
Asimina triloba	1											

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Asparagus asparagoides	1 13 18 2022 24 2829 32 42
Asparagus crispus	13 18 2022 24 28
Asparagus densiflorus	16 18 2022 24 26272829 31323334 38 44 48
Asparagus falcatus	13 28 48
Asparagus officinalis	5 13 18 20 24 272829 3233343536 39 42 45
Asparagus retrofractus	24 2829
Asparagus setaceus	13 16 18 2022 24 26272829 31323334 38 42 44 48
Asparagus virgatus	13 16
Astartea fascicularis	24 28
Aster petiolata	41
Asystasia chelonioides	13 18
Asystasia scandens	1
Atherosperma moschatum	1
Atriplex nummularia	18 29 3233 3536
Aucuba japonica	1 12 20 24 26272829 313233343536 3839 42 4445
Austrocedrus chilensis	6
Azara integrifolia	41
Azara microphylla	12 24 28
Backhousia myrtifolia	12 24
Baeckea linifolia	24 28
Baeckea virgata	24 28 46
Baloghia lucida	1 12 20 24 28
Bambusa arundinacea	1 3 20 24
Bambusa glaucescens	24
Bambusa vulgaris	13 18
Banksia brownii	
Banksia coccinea	16 4546
Banksia collina	40 4546
Banksia dryandroides	46
Banksia ericifolia	12 16 40 42 444546
Banksia grandis	12 20 24 28 32 40 4546
Banksia lehmanniana	40
Banksia marginata	16
Banksia media	46
Banksia menziesii	32
Banksia nutans	40

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Banksia occidentalis	28 32 40
Banksia ornata	46
Banksia prionotes	32 46
Banksia repens	46
Banksia serrata	12
Banksia speciosa	24 4546
Barklya syringifolia	12 20
Barleria cristata	12 24 27 29 31323334
Barleria obtusa	28
Barleria strigosa	1
Bauera rubioides	1 16 24 36
Bauera sessiliflora	12 33 3536 48
Bauhinia acuminata	12
Bauhinia hookeri	12
Bauhinia punctata	3334 36 38 42 44
Bauhinia purpurea	12 20 24 28 323334 36 3839 42 44
Bauhinia racemosa	1
Bauhinia scandens	1
Bauhinia tomentosa	1
Bauhinia variegata	20 323334 36 39 4445
Beaucarnea recurvata	1
Beaufortia decussata	3233 36 45
Beaufortia purpurea	3233 36
Beaumontia grandifolia	1 16
Begonia albo-picta	28
Begonia coccinea	6
Begonia corallina	16
Begonia dipetala	1
Begonia fagifolia	9
Begonia foliosa	1 6 9 24
Begonia grandis	9 24 28
Begonia maculata	1 9 16
Begonia metallica	16 20
Begonia odorata	1 9 16 20 24 28
Begonia reniformis	1
Begonia sanguinea	1 9

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Begonia stipulacea	1 9 16 20 24
Begonia tomentosa	9 16
Begonia undulatum	9 16 24 28
Begonia Xcredneri	16 20 24 28
Begonia Xsemperflorens-cul	16 20 24
Begonia Xweltoniensis	9 16 20 24 28
Berberis aristata	28 32
Berberis darwinii	1 12 20 24 26272829 313233343536 3839 42 44
Berberis dielsiana	
Berberis dulcis	1 12
Berberis hookeri	1 24 32
Berberis julianae	34
Berberis prattii	32
Berberis pruinosa	29 31
Berberis sargentiana	31
Berberis thunbergii	24 31323334 36 3839 4142 44
Berberis vulgaris	1 3 1213 18 20 24 2829 323334
Berberis wilsoniae	26272829 31323334 36 39
Berberis Xstenophylla	12 24 32 41
Berchemia racemosa	24
Betula nana	44
Betula pendula	12 20 24 28 3233343536 3839 4142 4445 47
Betula platyphylla	42 44
Bignonia argyrea	13 18 24
Billardiera longifolia	13
Billardiera scandens	16 20
Bixa orellana	1
Bocconia frutescens	13 18
Boehmeria argentea	18
Boehmeria nivea	1213 18 24
Boronia anemonifolia	1
Boronia cymosa	13
Boronia denticulata	12 4748
Boronia elatior	18 24 27 29 313233 36 38 40 44 47
Boronia filifolia	47
Boronia heterophylla	12 28 33 36 383940 454647

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Boronia ledifolia	1 16 20
Boronia megastigma	1213 16 18 2022 24 26272829 31323334 36 383940 42 4445464748
Boronia microphylla	1
Boronia pinnata	1 1213 16 18 20 24 2627
Boronia serrulata	1 12 16 20
Boronia spathulata	12
Bosea amherstiana	1213 18 20 24 26272829 313233343536 3839 42 4445
Bossiaea buxifolia	16 20
Bossiaea heterophylla	16
Bossiaea obcordata	16 20
Bossiaea rhombifolia	16 20
Bossiaea scolopendria	18
Bougainvillea glabra	13 18 2022 24 26272829 313233343536 3839 42
Bougainvillea reflugens	18 24 28
Bougainvillea spectabilis	1 6 13 18 2022 24 262728 313233343536 39 42
Bougainvillea Xbuttiana	28 313233343536 3839 42 48
Bouvardia angustifolia	20
Bouvardia leiantha	9 20 24
Bouvardia longifolia	9
Bouvardia ternifolia	1 3 9
Bouvardia victor lemone	20
Bouvardia Xalfred neuner	20 24
Bouvardia Xbridal wreath	9
Bouvardia Xcandidissima	9 20
Bouvardia Xdavonsii	9 20
Bouvardia Xdazzler	20
Bouvardia Xelegans	9
Bouvardia Xflavescens	20
Bouvardia Xhogarth	9 20 24
Bouvardia Xjasminoides	9
Bouvardia Xmaidensblush	9 24
Bouvardia Xpresident gar.	20 24
Bowkeria triphylla	18 24 28
Brachychiton acerifolius	1 3 1213 16 18 20 24 26272829303132333435363738 39 42 444546
Brachychiton discolor	18 2022 24 28 3233 35 37 4546
Brachychiton populneus	1 3 6 1213 16 18 2022 24 26272829303132333435363738 39 42 444546

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Brachychiton rupestris	1 18 24 28
Brachychiton Xhybridus	18 20 24 28 3233343536 3839 42 4445
Brachysema lanceolatum	18 33 36 4445
Brachysema latifolium	13
Brahea armata	18 20 24 28
Brahea dulcis	18 24 28
Brahea edulis	18 20 24 2829
Brassaia actinophylla	13 3839 42 4445 4748
Brexia madagascariensis	13 18 24 28
Breynia disticha	9 13 18 20 24 28
Brugmansia arborea	1 4 1213 18 20 24 272829 31323334 36 3839 4445
Brugmansia sanguinea	1 1213 18 20 24 272829 31323334 36 3839 45
Brugmansia suaveolens	1 3
Brunfelsia acuminata	1
Brunfelsia americana	13 18 24 28
Brunfelsia calycina	16
Brunfelsia latifolia	1 39 45
Brunfelsia pauciflora	1 12 18 24 28
Brunfelsia uniflora	1 18 24 28
Buddleia alternifolia	3233 36 38
Buddleia asiatica	13 18 20 24 28
Buddleia colvilei	31
Buddleia crispa	1
Buddleia davidii	18 20 24 272829 31323334 36 3839 42 44
Buddleia globosa	1 5 1213 18 24 2728 313233 36
Buddleia lindleyana	1 1213 18 24 28
Buddleia madagascariensis	1 1213 18 20 24 272829 31323334 36 38 44
Buddleia officinalis	24 28 3233 36
Buddleia salvifolia	1 1213 18 24 3233 3839 44
Buddleia Xintermedia	18 24
Burchellia bubalina	1 12 18
Bursaria spinosa	16 20
Butia yatay	20
Buxus balearica	13
Buxus microphylla	41
Buxus sempervirens	1 345 1213 18 20 24 28 3233 3536 41 4445 48

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Cadia purpurea	13 18 24 28
Caesalpinia gilliesii	9 1213 18 20 24 26272829 313233343536 3839 42 4445
Caesalpinia tara	12
Calliandra portoricensis	24
Callicarpa americana	12
Callicoma serratifolia	16 20
Callistemon brachyandrus	18
Callistemon citrinus	13 16 20 272829 31323334 36373839 42 4546 48
Callistemon lilacinus	40
Callistemon linearis	24
Callistemon macropunctatus	1213 16 18 20 24 282930 32 37 46
Callistemon pallidus	45
Callistemon phoeniceus	46
Callistemon pinifolius	18 40 46
Callistemon rigidus	1213 18 20 33
Callistemon salignus	1 39 46 48
Callistemon speciosus	1 13 16 20 28 45
Callistemon teretifolius	37
Callistemon viminalis	383940 42 45464748
Callistemon violaceus	18 20 28 46
Callistemon Xharkness	45
Callistemon Xkingsparksp.	48
Callitris columellaris	42 46
Callitris endlicheri	1 56
Callitris gunnii	1 5 13
Callitris macleayana	6
Callitris muelleri	33 36
Callitris oblonga	13 20
Callitris preissii	16 20 3637 46
Callitris rhomboidea	1 56 42
Calluna vulgaris	13 18 20 24 28 33 36 41
Calocedrus decurrens	18 20 24 3233 35
Calocephalus brownii	41 45
Calodendrum capense	18 20 24 2829 323334 36 3839 42 4445 48
Calonyction aculeatum	15 20 29
Calothamnus lehmannii	46

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Calothamnus quadrifidus		12	18								46
Calothamnus torulosus											46
Calothamnus villosus		13	18		24	28			3940		4546
Calycanthus floridus	1 34	12		20			3233	35			
Calycanthus occidentalis		13	18			28					
Calycotome spinosa	1										
Calystegia hederacea	6										
Calytrix tetragona		1213		20	24	28					
Camellia japonica	1 3 56			20			34	36	38 40	44	47
Camellia maliflora	1										
Camellia oleifera	1										
Camellia reticulata	1								40		47
Camellia Sasanqua	1							36	394041		47
Camellia sinensis	1 3										
Camellia Xwilliamsii									40		47
Campsidium filicifolia		13	18								
Campsidium valdivianum		13	18		24	28					
Campsis grandiflora	1 34	1213	18	20	24	26272829	31323334			42	44
Campsis radicans	1 689	1213	18		24	27	313233				
Campsis Xguilfoylei		1213	18	20	24	26272829	31323334				
Campsis Xtagliabuana	9	12									
Canavalia bonariensis		13	18	20	24	28	3233	35			
Cantua buxifolia		1213	18	20	24	272829	313233	3536	3839	42	4445
Cantua pyrifolia	1	1213									
Capparis mitchellii	1										
Capparis spinosa	1 3	1213	18	20	24	2829					
Cardiospermum halicacabum	8	15		20		29					
Carissa bispinosa		12		20	24	272829	313233	3536		45	
Carissa ovata			18		24	28					
Carmichaelia arborea	1										
Carmichaelia flagellifor.					24	28					
Carpentaria californica			18	20	24						
Carpinus betulus					24		3233	35			
Carya tomentosa	1		18	20	24						
Caryopteris clandonensis									38	44	48
Caryopteris incana					24	28	3233	3536	39	45	

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Cassia artemisioides	28 33 36 4546
Cassia bicapsularis	34 13 18 20 39 42 4445
Cassia corymbosa	3 18 24 28
Cassia didymobotrya	323334 36 39 42 4445
Cassia eremophila	24 28 46
Cassia floribunda	12 20 29 3233343536 38
Cassia laevigata	13 18 20 24 28 3233
Cassia planiticola	13
Cassia sturtii	33 4546
Cassia tomentosa	39
Cassine australis	1213 18 20 24 28
Castanea sativa	123 6 1213 181920 2324 26272829 31323334 36 39 43 45
Castanospermum australe	1 3 1213 18 20 24 36 48
Casuarina cristata	37 46
Casuarina cunninghamiana	30 3637 39 42 45
Casuarina drummondiana	36
Casuarina equisetifolia	18 45
Casuarina glauca	20 2425 282930 3233 3637 39 42 444546
Casuarina littoralis	18
Casuarina nana	45
Casuarina paludosa	40
Casuarina stricta	1213 16 18 20 24 272829 31 3334 363738 42 4546
Casuarina sumatranum	13 18 24 28
Casuarina torulosa	16 18 20 24 29 45 48
Catalpa bignonioides	1 3 121314 18 20 24 32 45
Catalpa speciosa	10 13 18 20 24 28 3233 36
Cavendishia acuminata	1
Ceanothus americanus	12
Ceanothus coeruleus	1213
Ceanothus dentatus	12
Ceanothus leucodermis	1 1213 18 20 24 272829 313233343536 39 45
Ceanothus masonii	38 42 44
Ceanothus papillosus	3839 45
Ceanothus thyrsiflorus	12
Ceanothus veitchianus	29 323334
Ceanothus Xdelilianus	18 39

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Ceanothus Xedwardsii	323334 36 3839 42 44
Ceanothus Xlobbianus	1213 24
Cedrela sinensis	42 4445
Cedronella canariensis	24
Cedrus atlantica	1314 18 20 24 272829 31323334 36373839 42 4445 48
Cedrus deodara	1 6 13 18 20 24 272829 31323334 36373839 4142 4445
Celtis australis	1 13 18 24 28 333435 37 39 42 44
Celtis occidentalis	1 3 45
Celtis sinensis	37 45
Centrosema grandiflora	20 29
Cephalotaxus fortunii	13 18 20 24 32
Cephalotaxus harringtonia	6 41
Ceratonia siliqua	1 3 10 121314 18 2022 2425 282930 323334 363738 42 44
Ceratopetalum apetalum	16 18 20 24
Ceratopetalum gummiferum	16 20 29 33343536 45
Ceratostigma griffithii	33 36
Ceratostigma plumbaginoi.	1 1213 18 20 24 28 3233
Ceratostigma willmottian.	29 323334 36 39 4142 4445
Cercis siliquastrum	1 1213 18 20 24 272829 313233343536 3839 42 4445
Cereus hexagonus	1
Cereus triquetra	1 3
Cereus variabilis	1 9 13
Ceropegia stapeliiformis	9 13
Cestrum aurantiacum	1 1213 18 20 24 272829 3233343536 3839 42 44
Cestrum diurnum	1213 18 20 24 28 32
Cestrum elegans	1 6 9 1213 18 24 26272829 313233343536 3839 42
Cestrum fasciculatum	1 6 9 1213 18 20 4445
Cestrum newellii	9 1213 20 32
Cestrum nocturnum	13 18 24 29
Cestrum scaber	1213
Chaenomeles speciosa	18 2022 24 29 323334 3839 42 4445 48
Chamaecyparis funebris	2 56 13 18 20 24 36 39
Chamaecyparis lawsoniana	13 18 20 24 3233343536 39 4142 47
Chamaecyparis nootkatensis	13 18 20 24 3233
Chamaecyparis obtusa	13 18 24 313233 36 39 41

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Chamaecyparis pisifera	13 18 20 24 313233 36 39 41 48
Chamaecyparis thyoides	6 18 24 32 36
Chamaecytisus prolifer	13 16 18 20222324 27 29 31323334
Chamaedorea elegans	20 24 48
Chamaerops humilis	1 13 18 20 24 272829 3132 34 42 44
Chamelaucium uncinatum	272829 3233343536 3839 42 4445464748
Chilianthus oleraceus	1 12
Chimonanthus praecox	1 13 18 20 29 3334 39 45
Chimonanthus virginicus	1
Choisya ternata	12 18 2022 24 272829 313233343536 3839 4445 47
Chorizema cordatum	12 18 20 24 28 3233343536 3839 444546
Chorizema ilicifolium	12 18 20 24 29 32
Chorizema varium	12 32
Chorizema varium	12 24 28
Chrysalidocarpus lutescens	18 20 24
Chrysophyllum cainito	1
Cinnamomum camphora	1 3 6 1213 18 20 24 272829 313233343536 3839 42 4445 48
Cinnamomum zeylandicum	1
Cissus antarctica	13 16 18 20 24 33 39 48
Cissus rhombifolia	48
Cissus striata	13 18 24 28 48
Cistus albidus	20 24 29
Cistus crispus	3233 41
Cistus incanus	12
Cistus ladanifer	13 20 24 2829 3233
Cistus monspeliensis	1 13 18 24
Cistus populifolius	41
Cistus psilosepalus	1
Cistus salviifolius	13 18 24
Cistus Xflorentinus	33
Cistus Xpurpureus	36 3839 42 4445 48
Cistus Xstenophylla	47
Citharexylum fruticosum	18 20 24 2829 3233343536 3839 42 4445 47
Citharexylum quadrangular	48
Citrus aurantiifolia	1 34 6 13 18 20 24 2829 323334 36 43
Citrus aurantium	1 34 6 13 18 20 24 26 29 31323334

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Citrus limon	1234 6 13 17181920222324 26272829 313233 3536 3839 41 45
Citrus maxima	1234 13 18
Citrus medica	1234 6 13 17181920222324 26272829 31 33
Citrus reticulata	1 3 6 13 181920 2324 26272829 313233343536 3839 41 45
Citrus sinensis	1234 6 13 17181920222324 26272829 313233343536 3839 41 45
Citrus Xnobilis	33 35
Citrus Xparadisi	20 24 272829 313233343536 3839 41 45
Clausena lansium	1
Clematis aristata	16 20
Clematis armandii	6
Clematis campaniflora	1
Clematis crispa	18
Clematis flammula	1 6 13 18 2022 24 28 32
Clematis florida	1 6 18
Clematis heracleifolia	1 6
Clematis jubata	18
Clematis lanuginosa	13 18 20 41
Clematis microphylla	5 13 16 20
Clematis montana	1 13 18 20 24 26272829 313233343536 3839 42 4445
Clematis orientalis	18
Clematis paniculata	16 18 20 24
Clematis tangutica	29 3233
Clematis texensis	13 18
Clematis virginiana	1
Clematis viticella	1 13 18
Clematis XDuchess of Edin.	13 18
Clematis Xjackmanii	8 13 18 20 26 28 33 42
Clematis Xpatens	13 18 20 33
Clerodendron glabrum	18 24
Clerodendron nutans	13
Clerodendron philippinum	13 18 24 32
Clerodendron splendens	1
Clerodendron thomsoniae	13 18 20
Clerodendron tomentosum	13 18 24
Clerodendron ugandense	33343536 3839 42 4445
Clethra alnifolia	18 24

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Clethra arborea	13 18 20 24 2829 3233343536 3839 4445 4748
Cleyera japonica	24 28
Clianthus puniceus	111213 16 18 2022 24 272829 313233343536 3839 4445
Clitoria ternatea	8 18
Clytostoma callistegioides	13 18 20 24 26272829 31323334 36 3839 42 4445
Cneorum tricoccon	1213
Cobaea scandens	1 8 11 13 15 18 2022 24 26272829 313233343536 45
Coccoloba uvifera	42
Coffea arabica	1
Coleonema album	1 1213 18 2022 24 272829 313233343536 3839 42 4445 47
Coleonema pulchrum	42 4445 4748
Colletia cruciata	1213 18 20 24
Columnea scandens	1
Columnea schiedeana	1
Colutea arborescens	1 3 18 32
Colutea Xmedia	3
Combretum coccineum	1
Comesperma volubile	16 20
Conospermum ericaefolia	16 20
Conospermum longifolium	16 20
Conospermum taxifolium	16 20
Convolvulus cneorum	4142
Convolvulus floridus	13 18 24
Convolvulus mauritanicus	8 11 13 18 20 24 28 323334 41 47
Coprosma lucida	1213 16 18 20222324 272829 3132 34 38 42
Coprosma repens	1213 18 20 24 27 29 31323334 44 4748
Coprosma robusta	12 16
Coprosma spathulata	13 18 24
Coprosma Xkirkii	4142
Cordyline australis	1 3 1213 16 18 20 24 26272829 31323334 3839 42 4445 4748
Cordyline baueri	42
Cordyline indivisa	16 20 29
Cordyline stricta	1213 18 24 28 38
Cordyline terminalis	13 18 42
Coriaria myrtifolia	12 18 24
Coriaria nepalensis	13 18 24

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Cornus alba	18
Cornus capitata	12 20 24 28 3233 45
Cornus sanguinea	18 24 3233
Corokia buddleioides	16
Corokia cotoneaster	41 45
Coronilla emerus	18 20 24
Coronilla juncea	1
Coronilla valentina	1 3 1213 18 20 24
Correa alba	1213 16 18 20 24 28 45
Correa decumbens	47
Correa glabra	47
Correa pulchella	41 454647
Correa reflexa	111213 16 18 2022 24 2728 313233 3536 38394041 44454647
Cortaderia selloana	9 1213 18 2022 24 26272829 31323334 39 4142 4445 48
Corylopsis spicata	18
Corylus avellana	12345 13 17181920 24 29 323334 41 43 45
Corynocarpus laevigata	1 3 12 16 18 20 24 28 32 39 45 48
Cotinus coggygria	1 18 20 24 3233 36 39 45
Cotoneaster adpressus	41
Cotoneaster affinis	1213 18 24
Cotoneaster bullatus	18 24
Cotoneaster buxifolius	12 18 20 27 31323334
Cotoneaster congestus	41
Cotoneaster dammeri	41
Cotoneaster franchetii	3334 38 44
Cotoneaster frigidus	18 24 32
Cotoneaster glaucophyllus	3334 36 3839 42 44
Cotoneaster henryanus	34
Cotoneaster horizontalis	3233 3839 4142 44
Cotoneaster lacteus	34 36 3839 42 44
Cotoneaster lindleyi	18
Cotoneaster microphyllus	1213 18 20 24 29 3233 41
Cotoneaster pannosus	29 323334 38 42 44
Cotoneaster rugosus	33
Cotoneaster salicifolius	33
Cotoneaster simonsii	1213 18 24

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Cotyledon orbiculata	1 3 9 13 3334
Crassula arborescens	323334
Crassula argentea	13 18 24 28
Crassula ciliata	1
Crassula falcata	41
Crassula lactea	9 13 32
Crataegus arnoldiana	34
Crataegus azarolus	1 18 24
Crataegus calpodendron	13 18 24 37
Crataegus crus-galli	18 24 33 36 39
Crataegus douglasii	18 24 33
Crataegus laevigata	1 1213 18 2022 24 272829 31323334 36 3839 41 44
Crataegus mexicana	13 18 24 3233 36 3839 44
Crataegus monogyna	
Crataegus orientalis	13 18 24 3233 36 39
Crataegus phaenopyrum	18 24 3233 36 3839 4142 44
Crataegus uniflora	3334
Crataegus Xlavallei	18 24 3233 36 3839 44
Crataegus Xprunifolia	13 18 24
Crotalaria cunninghamii	16 20 29 33
Crotalaria laburnifolia	3
Crowea exalata	47
Crowea saligna	1 12 16 18 20 47
Crowea XexaltaXsaligna	47
Cryptomeria japonica	1 6 13 18 20 24 313233 3536373839 41
Cunninghamia lanceolata	1 6 18 24
Cuphea cyanea	8
Cuphea hyssopifolia	4142 44 47
Cuphea ignea	1 8 1213 18 20 24 28 3334 3839 4142 4445 4748
Cuphea jorullensis	1 1213 18 20 24 2829 34 48
Cuphea lanceolata	8
Cuphea micropetala	8 33
Cuphea Xpurpurea	8 13 18
Cupressus arizonica	3233343536373839 44
Cupressus glabra	42
Cupressus goveniana	13 18 20 24

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Cupressus lusitanica	1 5 13 18 20 24 38 42 44 47
Cupressus macrocarpa	1 5 1314 18 20222324 27282930313233343536373839 42 44454647
Cupressus sempervirens	1 3 56 10 13 18 20 2425 27282930313233343536373839 4142 44 4748
Cupressus torulosa	12 56 10 13 18 20 24 2728 313233343536 3839 4142 4445 4748
Cussonia thyrsiflora	1
Cycas revoluta	13 18 20 24 28
Cydonia oblonga	123456 13 171819202223 24 2627 293031 33343536 3839 41 45
Cyperus alternifolius	13 18 20 24 2829 34 38 4142 44 48
Cyperus papyrus	13 18 24 28 32
Cyphomandra betacea	18 20 24 272829 31 3334 3839 42 4445
Cytisus albus	12 18
Cytisus austriacus	1
Cytisus canariensis	1 13 18
Cytisus fragrans	24 2728 3132 34 38 42 44
Cytisus hirsutus	1 5
Cytisus linifolium	1 18
Cytisus multiflorus	3 13 18 20 24 26 2829 323334
Cytisus nigricans	1 13
Cytisus purpurea	1
Cytisus racemosus	1
Cytisus scoparius	3 18 2022 24 26272829 31323334 36 39 45
Cytisus sessilifolius	5
Cytisus spachianus	1
Cytisus Xlilactime	31 3334
Daboecia azorica	41
Daboecia cantabrica	1 9 1213 18 24 28 41 47
Dacrydium cupressinum	13 16
Dacrydium franklinii	1 18 24 3233
Dais cotinifolia	3839 42 45
Damnacanthus indicus	18
Dampiera diversifolia	4748
Daphne cneorum	41
Daphne collina	41
Daphne genkwa	1 1213 18 41
Daphne laureola	1
Daphne odora	1 3 1213 18 20 24 26272829 313233343536 3839 42 45 4748

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Daphne Xburkwoodii	4142
Daphne Xhybrida	1 1213
Daphniphyllum glaucescens	18 24
Darwinia citriodora	46
Dasylirion graminifolium	18
Dasylirion serratifolium	13 18 24
Dasylirion wheeleri	18
Daubentonia longifolia	1
Daviesia alata	16 20
Daviesia latifolia	16 20
Daviesia longifolia	16 20
Daviesia microphylla	16 20
Daviesia ulicifolia	16 20
Delonix regia	1 9
Dendrocalamus strictus	1
Dendropanax trifidus	24
Deutzia corymbosa	18 24
Deutzia crenata	1213 18 20 24 272829 31323334 36
Deutzia discolor	18
Deutzia gracilis	1 1213 18 2022 272829 313233 36 3839 42 45
Deutzia parviflora	18 24
Deutzia scabra	1 3 1213 18 20 24 29 33 39 45
Deutzia Xlemoinei	24
Deutzia Xrosea	45
Dicksonia antarctica	9 13 16 18 20 31
Dicksonia squarrosa	9 16
Dicksonia youngiae	9 16 18 20
Dictyosperma album	20
Dieffenbachia maculata	13 18 24 48
Dillwynia acicularis	16 20
Dillwynia retorta	16 20
Dioscorea discolor	13 18 24 28
Diosma ericoides	1
Diospyros kaki	1 13 17181920222324 2627 31323334 38 45
Diospyros lotus	1
Dipilopappus filifolius	1213 18 20 24 26272829 31323334 36 3839 42 4445 47

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Diplazium australe	9 16
Diplazium thwaitesii	16
Diploglottis australis	1
Diplothemium maritimum	13 20 24 29 323334
Distictis buccinatoria	1 1213 18 20 24 26272829 31323334 36 39 42 4445
Dizygotheca elegantissima	13 16 20 24 28 42 44
Dizygotheca veitchii	13 16 18 20 24
Dodonaea hackettiana	20
Dodonaea lobulata	46
Dodonaea triquetra	16 20
Dodonaea viscosa	16 20 38 4445 48
Dolichos lablab	1 15 18 20 29
Dolichos lignosus	1 34 68 13 15 18 2022 24 26272829 313233343536
Dombeya burgessiae	1213 18 20 24 28 32
Dombeya mollis	12
Dombeya tiliacea	13 18 20 24 272829 3132333435
Doryanthes excelsa	3 6 1213 16 18 20 24 29
Doryanthes palmeri	1213 18 20 24 28
Doryphora sassafras	1
Dovyalis caffra	12 18 20 2324 29 34
Doxantha capreolata	3 1213 18 20 24 262728 313233
Dracaena deremensis	38
Dracaena draco	1213 18 20 24 28 42
Dracaena fragrans	13 20 24 28
Dracaena goldieana	18 28
Dracaena marginata	13 18 24 28 48
Dracaena sanderana	24
Dracaena surculosa	24 28 48
Dracophyllum secundum	18
Drimys aromatica	24
Dryandra baxteri	40
Dryopteris richardsii	13 18 20
Duranta repens	1 1213 18 2022 24 26272829 313233343536 3839 42 4445 48
Eccremocarpus scaber	13 15 18 20 29
Echites andrewsii	1
Echium candicans	8 1213 18 20

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Edgeworthia papyrifera	1											
Ehretia tinifolia	1											
Elaeagnus angustifolia			13	18								
Elaeagnus commutata			12					32				
Elaeagnus pungens										38	41	4445
Elaeagnus umbellata			1213	18	20	24	28	3233343536		39		
Elaeis oleifera			13									
Elaeocarpus reticulatus				16		24						
Enkianthus perulatus				18		24						
Ensete ventricosum		11		18	20	24	272829	31			42	4445
Entelea arborescens			13	16	18		24					
Epacris longiflora	1			16		20						
Epacris microphylla				16		20						
Epacris pulchella				16		20						
Epiphyllum phyllanthus	1											
Epipremnum aureum			13		18		24			38		
Eranthemum macrophylla			13		18							
Eranthemum strictum					18							
Ercilla spicata	1						24	28				
Eremophila maculata			12									46 48
Erica arborea			11 13		18	20	24	28	3233			47
Erica baccans	1		13		18	20	24	28		36	40	47
Erica baueri	1		13		18	20	24	28	3233	36		47
Erica canaliculata											42	47
Erica carnea								32			41	47
Erica cerinthoides			13		18	20	24	28	3233			47
Erica ciliaris			13		18		24	28	3233			
Erica colorans					18		24		33	36	40	47
Erica concinna			13									
Erica conspicua												47
Erica cruenta			13		18	20	24	28	3233	36		47
Erica densifolia												47
Erica diaphana												47
Erica exsurgens										36		
Erica formosa			13		18	20	24	28				47
Erica glandulosa												47

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Erica gracilis											42	
Erica holosericea				18	20	24	28		36			
Erica hyemalis			13	18	20	24	28					
Erica jubilee								3233	36			47
Erica lateralis									36			
Erica linoides			13	18	20	24	28					47
Erica lusitanica												
Erica mackinnoniae				18	20	24	28	3233	36			
Erica mammosa	1		13	18	20	24	28	3233	36			47
Erica mediterranea			13	18	20	24	28					
Erica melanthera			13	18	20	24	28	3233	36	383940		4748
Erica multiflora	1							3233	36	40		47
Erica nudiflorum	1											
Erica parviflora	1											
Erica persoluta			13	18	20	24	28	3233	36	40		47
Erica peziza												47
Erica pinea	1											
Erica pyramidalis			13	18	20	24	28					
Erica quadrangularis												47
Erica regerminans				18		24	28					
Erica rubens			13	18	20	24	28					47
Erica sessiliflora												47
Erica subdivaricata												47
Erica tetralix			13	18		24	28			41		
Erica vagans			13	18		24				41		47
Erica ventricosa			13	18	20	24	28	3233	36			47
Erica vernix						24						
Erica verticillata	1			18		24	28					
Erica vestita				18		24	28			40		47
Erica viridipurpurea									36			
Erica Xaurora										40	42	4748
Erica Xautuminalis			13	18	20	24	28	3233	36	40		
Erica XCavandishii			13	18	20	24	28	3233	36	40		47
Erica Xdarleyensis										404142		4748
Erica Xintermedia				18	20	24	28					47
Erica Xlambertiana				18		24						

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Erica Xormondi										40		47
Erica Xwebbleyiana				18	20	24	28					47
Erica Xwilmorei			13	18	20	24	28	3233	36	40		47
Eriobotrya japonica	1 34 6		1213	17	18	19	20222324	26272829	31323343536	39	43	48
Eriocephalus africanus										41		
Eriostemon myoporoides			1213	16	18	20	24	272829	31323343536	3839	434445	47
Eriostemon scaber				16								
Erythrina acanthocarpa						24			36		45	
Erythrina blakei	1							33				
Erythrina caffra	1 5		12									
Erythrina corallodendrum	1 34		1213		18	20	24	28	3233	38	42	44
Erythrina crista-galli	1 34		1213		18	20	24	26272829	313233	36373839	42	4445
Erythrina herbacea	1											
Erythrina humeana	1				18	20	24	28	32			
Erythrina parcelii			1213									
Erythrina secundiflora			13		18		24					
Erythrina speciosa			1213									
Erythrina subumbrans	1											
Erythrina variegata	1		1213					33	3637	39	45	
Erythrina vespertilio	1											
Erythrina Xbidwillii	1 6		1213		18	20	24	272829	3132 34		42	
Erythrina Xhendersoni			1213		18	20						
Escallonia bifida	1		1213		18	20	24	27 29	3132 34			
Escallonia laevis	1											
Escallonia rosea										38	42	44 48
Escallonia rubra	1		1213		18	20	24	26272829	31323334	36 3839	4142	4445 4748
Escallonia virgata					18						41	
Escallonia Xexoniensis					18	20	24		33			
Escallonia Xlangleyensis							24	29	323334	36 39		
Escallonia Xrockii									3233	36 39		
Eucalyptus acmenioides						20						
Eucalyptus amygdalina				16	18	20		29				
Eucalyptus astringens										37	42	46
Eucalyptus bosistoana						20						
Eucalyptus botryoides				16		20		27 29	31323334353637	39	43	46 48
Eucalyptus brockwayi												4546

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Eucalyptus burdettiana	46 48
Eucalyptus caesia	31323334 363738 42 444546 48
Eucalyptus calophylla	10 1213 16 18 20 24 26272829 31323334 3637 46
Eucalyptus calycogona	46
Eucalyptus camaldulensis	10 12 16 18 20 25 27 293031 333435363738 42 4546
Eucalyptus campaspe	46
Eucalyptus capitellata	20
Eucalyptus cinerea	37 4546
Eucalyptus citriodora	1213 15 18 20 24 26272829303132333435 3738 42 444546
Eucalyptus cladocalyx	10 121314 16 18 2022 24252627282930313233343536373839 42 444546 48
Eucalyptus cneorifolia	20 37 46
Eucalyptus conglobata	37
Eucalyptus cornuta	10 13 16 18 20 25 27 293031323334353637383942 46
Eucalyptus cosmophylla	20 46
Eucalyptus crebra	16 18 20 29
Eucalyptus crucis	323334 36 46
Eucalyptus decipiens	46
Eucalyptus delegatensis	16
Eucalyptus diversicolor	10 16 20 29 34 37 46
Eucalyptus diversifolia	46
Eucalyptus dundasii	42 4546
Eucalyptus eremophila	40 46
Eucalyptus erythronema	29 3334 3637 39 42
Eucalyptus eximia	16 20 42
Eucalyptus falcata	4546
Eucalyptus fasciculosa	46
Eucalyptus fibrosa	13 16 18
Eucalyptus ficifolia	1213 16 18 2022 24 262728293031323334 36373839 42 444546 48
Eucalyptus flocktoniae	46
Eucalyptus forrestiana	34 3637 3940 42 444546 48
Eucalyptus gardneri	4546
Eucalyptus gillii	46
Eucalyptus globulus	6 10 1213 16 18 20 2425 272829303132 34 373839 42 444546 48
Eucalyptus gomphocephala	16 18 24 262728293031 333435363738 42 45 48
Eucalyptus goniocalyx	16 20 29
Eucalyptus grandis	46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Eucalyptus gummifera	16 20 29
Eucalyptus gunnii	16 18 20
Eucalyptus haemastoma	16 20 29
Eucalyptus intertexta	37 46
Eucalyptus kingsmillii	16 20 29 46
Eucalyptus kruseana	36 42 444546
Eucalyptus lansdowneana	3637 4546
Eucalyptus largiflorens	16 20 25 46
Eucalyptus lehmannii	16 20 29 363738 42 4546 48
Eucalyptus leucoxylon	10 16 18 20 2425 27 293031 3334 3637 42 444546 48
Eucalyptus linearis	46
Eucalyptus longifolia	16 20 29
Eucalyptus macarthurii	45
Eucalyptus macrocarpa	27 33 42 4546 48
Eucalyptus maculata	16 20 29 31 34 37 42
Eucalyptus marginata	10 12 16 18 20 29 34
Eucalyptus megacornuta	46
Eucalyptus melanophloia	30
Eucalyptus melliodora	13 16 20 29 46
Eucalyptus microcorys	16 20 29 46
Eucalyptus moluccana	16 20 29
Eucalyptus nicholii	4546
Eucalyptus nutans	3132
Eucalyptus obliqua	16 18 20 29
Eucalyptus obtusifolia	16 20
Eucalyptus occidentalis	37 4546
Eucalyptus odorata	16 37 46
Eucalyptus oldfieldii	16 20
Eucalyptus oleosa	46
Eucalyptus paniculata	16 20 29
Eucalyptus pauciflora	16 20 29 46
Eucalyptus piperita	16 20 29
Eucalyptus platypus	20 37 42 4546 48
Eucalyptus polyanthemos	16 20
Eucalyptus porosa	20 29 46
Eucalyptus preissiana	13 16 3233 3637 45

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Eucalyptus pulverulenta	20 33
Eucalyptus pyriformis	3334 3637 46
Eucalyptus regnans	16 20 29
Eucalyptus resinifera 6	16 20 29
Eucalyptus robusta	16 20 29
Eucalyptus rubida	4546
Eucalyptus saligna	16 29 38 42
Eucalyptus salmonophloia	26 29 36 42 46
Eucalyptus salubris	20 46
Eucalyptus sargentii	46
Eucalyptus scoparia	4546
Eucalyptus sepulcralis	3233 37 4546
Eucalyptus sideroxylon	20 29 42 444546
Eucalyptus sieberi	16
Eucalyptus socialis	37
Eucalyptus spathulata	34 40 42 444546 48
Eucalyptus steedmanii	37 4546
Eucalyptus stoatei	37 4546
Eucalyptus stricklandii	272829 31323334 36 738 42 444546 48
Eucalyptus tereticornis	16 20 29
Eucalyptus tetragona	37 4546
Eucalyptus tetraptera	13
Eucalyptus tetraptera	323334
Eucalyptus torquata	2728293031323334 36373839 42 444546 48
Eucalyptus viminalis	16 18 20 25 29 4546
Eucalyptus woodwardii	37 42 4546
Eucalyptus Xrhodantha	46
Eugenia brachyandra	18
Eugenia brasiliensis	13 18 24
Eugenia eucalyptoides	1213 18 20 24 28
Eugenia uniflora 1	
Euonymus europaea 1	33 48
Euonymus fimbriata	13 18 24
Euonymus fortunei	1213 18 24 33
Euonymus japonicum 1 34 6	1213 18 20 24 26272829 31323334 38 4142 4445 47
Eupatorium ligustrinum	18 20 27 29 31323334 36 3839 42 44

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Eupatorium megalophyllum				18			28					
Eupatorium riparium			1213	18	20	24						
Eupatorium sordidum	1		13	18		24	28	33	36	39		
Euphorbia balsamifera			13									
Euphorbia clava		6										
Euphorbia fulgens	1											
Euphorbia milii			13	18		24	28					
Euphorbia pulcherrima		9	1213	18	20	24	26272829	313233343536		3839	42	4445
Euphorbia splendens	1	6	12		20		29	34				
Euphorbia wulfenii											41	
Eupomatia laurina	1											
Eurya japonica			12									
Euryops pectinatus											41	4748
Euscaphis japonica				18								
Eustrephus latifolius			13	18		24						
Eutaxia myrtifolia			13									
Exocarpos cupressiformis				16	20							
Exocarpos strictus				16	20							
Exochorda korolkowii				18		24		3233	3536	39	45	
Exochorda racemosa					20					38		
Fabiana imbricata			1213	18	2022	24	26272829	31323334		39	42	4445
Fagelia bituminosa	1		13	18								
Fagus sylvatica	1			18	20	24		33	3536	39	45	
Fatsia japonica			12		20	24	28	32	34	3839	42	44
Feijoa sellowiana					20	24	26272829			39	4445	48
Felicia amelloides		11			20	24	2627 29	3132333435		38	4142	4445
Felicia echinata								3233	36	39	4142	4748
Felicia fruticosa							2829	33			4142	4445
Ficus aspera			1213	18		24						
Ficus benjamina		6	13	18		24	28		36			48
Ficus cannonii												
Ficus carica	1	3456	13	17	18	1920	24	26272829	313233343536	3839	43	45
Ficus elastica	1	34 6	13	18	20	24	2829	3334	36	39	42	4445
Ficus hillii								33	3536	39		4445
Ficus macrophylla	1	34 6 10	1213	16 18	20	24	26272829	31323334		3839	42	4445
Ficus nymphaefolia			13	18		24	28					

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Ficus pumila	1	6	13	18	20	24	272829	313233	3435	36	3839	4142	4445	48
Ficus racemosa			1213	18		24								
Ficus religiosa	1		13	18										
Ficus rubiginosa		6	1213	18	20	24	272829	313233		36	3839	42	4445	48
Ficus sagittata			13	18			28							4748
Ficus sycomorus	1													
Ficus virens			13											
Firmiana simplex		4	13	18										
Flacourtia jangomans	1													
Fontanesia phillyreoides						24	28							
Forsythia suspensa			1213	18		24		33						
Forsythia viridissima	1		1213	18		24		33				41		
Forsythia Xintermedia												4142	4445	
Fortunella japonica		6	13	17	1920	24	2829	33	3536	3839		41	4445	
Fothergilla gardenii								33						
Franseria artemisoides				18		24								
Fraxinus americana		10	1213	18	20	24		33						
Fraxinus angustifolia								33	3435	3637	3839	41	4445	
Fraxinus excelsior	1	34 10	1213	18	20	24	282930	3233	3435	36	3839	41	44	
Fraxinus nigra				18		24		3233						
Fraxinus ornus	1			18		24		3233		3637				
Fraxinus oxycarpa				18				33	3435	36	3839	41	4445	
Fraxinus pennsylvanica				18							39			
Fraxinus velutina								3233	3536					
Fremontodendron californ.								32						
Furcraea foetida	1	3 6 9	1213	18		24	28							
Furcraea selloa				18		24	28							
Galphimia glauca				18										
Gardenia devoniana	1													
Gardenia jasminoides	1	3 6	1213	18	20	24	28	33			3839	4142	4445	4748
Gardenia lucida	1													
Gardenia thunbergia	1	1112		18	20	24	2829	31323334						
Garrya elliptica			1213	18	20	24	272829	313233	3435	36	3839	42	4445	47
Garrya macrophylla				18										
Gaultheria hispida				18		24								
Gaultheria shallon				18		24						41		

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Gaultheria sinensis											41	
Geijera parviflora				16								
Geitonoplesium cymosum		6	13	16	18	20	24					
Gelsemium sempervirens	1	6	13		18	20	24				42	
Genista aethnensis							2627	29	3132	3435	39	
Genista anglica	1											
Genista lydia											41	
Genista monosperma			1213		18	20	24	262728	313233	343536	3839	42 4445
Genista monspessulana												
Genista sagittalis											41	
Genista tinctoria											41	
Ginkgo biloba	1 3		13		18	20	24	28	3233	35	3839	42 4445 4748
Gleditsia sinensis	1	5	1213		18		24	28				
Gleditsia triacanthos	1 3					20		29		37		
Gmelina asiatica	1											
Gnidia simplex					18		24	28				
Gompholobium grandiflorum				16		20						
Gompholobium latifolium				16		20						
Gompholobium polymorphum				16		20						
Goodenia ovata			13									
Goodia lotifolia					18				33			
Gordonia axillaris					18		24		3233	3536	39	45 47
Graptophyllum nortonii					18							
Graptophyllum pictum	1											
Grevillea alpina					18		24		3233	36		
Grevillea annulifera												48
Grevillea aspleniifolia									34			
Grevillea banksii			1213		18						40 42	444546
Grevillea bipinnatifida												
Grevillea biternata												464748
Grevillea buxifolia					18							
Grevillea caleyi	1								33	36		
Grevillea dimorpha			12				24	28				
Grevillea ericifolia					18		24	28	32			
Grevillea hilliana		9	12		18	20	24	29				
Grevillea hookerana												47

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Grevillea jenkinsii	46
Grevillea juniperina	24 4546
Grevillea lanigera	3233 36
Grevillea lavandulacea	9 3233
Grevillea longifolia	6
Grevillea obtusiflora	47
Grevillea paniculata	37
Grevillea punicea	6 18 24 28
Grevillea robusta	123 6 910 1213 16 18 20 24 26272829 313233343536373839 42 444546 48
Grevillea rosmarinifolia	9 13 3233343536373839 42 4445464748
Grevillea sericea	16 20
Grevillea thelemanniana	3334 36 46
Grevillea tripartita	12
Grevillea victoriae	46
Grevillea Xrobyngordon	4748
Grewia occidentalis	9 1213 18 24 36
Greyia sutherlandii	18 24
Griselinia lucida	18
Hakea acicularis	9 13 16 18 20 46
Hakea elliptica	46
Hakea francisiana	46
Hakea fraseri	37
Hakea grammatophylla	12 16 20 2829 32
Hakea laurina	9 1213 16 18 2022 24 272829 3132333435363733940 42 4445464748
Hakea leucoptera	46
Hakea microcarpa	9
Hakea multilineata	30 34 3940 42 46
Hakea myrtoides	28
Hakea petiolaris	4546
Hakea salicifolia	46
Hakea saligna	16 37 42 4445
Hakea suaveolens	9 1213 18 20 24 28 37
Hakea undulata	30
Hakea victoriae	46
Halesia tetraptera	1 18 24
Halimium lasianthum	12 18 24 3233

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Hamelia patens	6
Hardenbergia comptoniana	11 13 16 20 24 28 3233 3940 42 4546
Hardenbergia violacea	6 9 11 13 16 18 2022 24 26272829 313233343536 3839 42 444546
Harpephyllum caffrum	24
Harpullia pendula	36
Hebe albicans	47
Hebe balfouriana	41
Hebe buxifolia	9 1213 18 24 41 47
Hebe colensoi	24 3233
Hebe cupressoides	9 1213 18 24 3233 42
Hebe diosmifolia	9 13 18 20 24 2829 3334 36 42 44
Hebe elliptica	9 1213 18 24 42
Hebe hectorii	9 1213 18 20 24 26272829 31323334 36
Hebe hulkeana	9 1213 18 24 2829 323334 36 3839 42 44
Hebe insularis	42
Hebe ligustrifolia	3
Hebe macrocarpa	9 13 18 24 28
Hebe parvifolia	12 27 31
Hebe pinguifolia	24 41
Hebe salicifolia	1 9 1213 18 20 272829 31 3334
Hebe speciosa	9 1213 18 20 24 26272829 31323334 36 3839 42 44
Hebe traversii	18 24 28
Hebe Xandersonii	1 9 1213 18 20 24 26272829 31323334 36 3839 42 44
Hebe Xblue gem	42 44
Hebe Xla seduisante	32 42 48
Hebe Xlobelioides	9 13 18 24 28 3233 36 39
Hebe Xwairiki	47
Hedera canariensis	13 18 20 24 28 3839 4142 4445
Hedera colchica	24 3233
Hedera helix	1 3456 13 18 2022 24 272829 313233343536 3839 4142 44 48
Hedera rhombea	13 27 31
Hedychium coronarium	13 20 24 28 41
Hedychium flavum	41
Hedysarum multijugum	4 15 18
Hedyscepe canterburyana	13 18
Hemiandra pungens	47

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Heteromeles arbutifolia	1 13 18 24
Hibbertia cuneiformis	13 18 24 28
Hibbertia scandens	13 16 18 20 24 28 32
Hibiscus coccineus	13 18
Hibiscus grandiflorus	9 1213 18 20 24 2829
Hibiscus heterophyllus	13 18 20 24 28 32
Hibiscus huegelii	9 12 2829 3334 42 44 46
Hibiscus indicus	2728 31323334
Hibiscus lasiocarpus	18
Hibiscus moscheutos	1 9 13 24 32 39
Hibiscus mutabilis	1 3 6 9 1213 18 20 24 2829 323334 44
Hibiscus pedunculatus	1 18 20 24
Hibiscus radiatus	1
Hibiscus rosa-sinensis	1 6 9 1213 18 20 24 26272829 31323334 36 3839 42 4445 48
Hibiscus schizopetalus	13 18 24
Hibiscus splendens	1 3 9 12 31323334 36 3839 42 48
Hibiscus syriacus	1 34 9 1213 18 20 24 2829 32 34 36 39 42 44
Hippophae rhamnoides	13 18 20
Histiopteris incisa	9 13 18
Hoheria populnea	36 3839 45
Holmskioldia sanguinea	1 36
Holodiscus discolor	18 24
Homalocladium platycladum	13 18 20 24 28 32 3839
Hovea celsii	1 28 32 40
Hovea chorizemifolia	28
Hovea longifolia	16 20 40
Hovea pungens	28 33 35
Hovea trisperma	32 36
Hovenia dulcis	1 20 24
Howea belmoreana	13 18 20 24 272829 31
Howea forsterana	13 16 18 20 24 2728 31 34 38 44 48
Hoya australis	1 38
Hoya bella	1 6 13 18 20 24 26272829
Hoya carnosa	1 6 13 313233343536 3839 4445 48
Hoya globosa	18
Hoya imperialis	18 24

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Hydrangea anomala	18 24
Hydrangea macrophylla	1 34 6 9 1213 18 20 24 26272829 31323334 45 48
Hydrangea paniculata	9 13 18 20 24 33
Hylocereus triangularis	1 3 9 13
Hymenaea courbaril	1
Hymenanthera crassifolia	13 18 24 28
Hymenosporum flavum	20 42 4445 4748
Hyophorbe verschaffeltii	13 18 20 24
Hypericum calycinum	1 13 41
Hypericum canariense	9 1213 18 20 24 28
Hypericum chinense	20
Hypericum kalmianum	24
Hypericum leschenaultii	42
Hypericum olympicum	1 33
Hypericum patulum	24 29 34 3839 42 4445
Hypericum reptans	13 18 24 3233 41
Hypericum Xmoseranum	18 20 24 26272829 31323334 38 4142 44 48
Iboza riparia	272829 3132333435 4445
Idesia polycarpa	33 35 45
Ilex aquifolium	12 6 9 1213 18 20 24 272829 31323334 36 3839 42 44 4748
Ilex cassine	18 24
Ilex cornuta	1 9 1213 18 24
Ilex insignis	18 24
Ilex opaca	9 1213
Ilex serrata	18 24
Ilex Xaltaclarensis	9 1213
Illicium anisatum	1 12 18 24
Impatiens oliveri	33343536 3839 4445
Indigofera australis	5 12 16 18 4546
Indigofera gerardiana	13 24
Indigofera incarnata	1 1213 16 20 3233 41 45
Iochroma coccinea	12 20 27 29 31323334
Iochroma cyaneum	6 1213 18 20 24 2829 34
Iochroma grandiflora	1213 18 20 24 272829 313233
Ipomoea acuminata	6 13 15 18 2022 24 2627 29 31323334 36
Ipomoea bonariensis	13

	1850 - 1870 - 1880 - 1890 - 1900 - 191 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Ipomoea horsfalliae	18 20
Ipomoea palmata	1
Ipomoea purpurea	1
Ipomoea sinnuata	18
Ipomoea Xhardingii	18 24
Isopogon cuneatus	36 4647
Isopogon roseus	40 46
Ixora acuminata	18
Ixora chinensis	1
Ixora coccinea	1 48
Ixora speciosa	13 18 24
Jacaranda mimosifolia	1213 18 20 24 26272829303132333435 36 3839 42 4445
Jacksonia scoparia	18 24
Jacobinia sericea	1 6 1213 18 20 24 28 32
Jacquinia aurantiaca	1
Jasminum azoricum	42 4445 48
Jasminum didymum	1 18
Jasminum floridum	13 18 24
Jasminum fruticans	1 4 1213 18 24
Jasminum grandiflorum	1 6 1213 18 20 26272829 31323334 36 3839 42 4445
Jasminum humile	1 3 56 1213 18 20 24 272829 31 34
Jasminum leratti	1
Jasminum lineare	1
Jasminum mesnyi	24 26272829 31323334 36 3839 42 44
Jasminum multiflorum	1 18 28
Jasminum nudiflorum	1 5 13 18 20 24 28
Jasminum odoratissimum	1
Jasminum officinale	1 3 56 1213 18 20
Jasminum parkeri	41
Jasminum polyanthum	39 42 4445
Jasminum sambac	1 13 18 20
Jasminum subhumile	12 18 24 28
Jasminum volubile	1 6 1213 18 20 24 32
Jasminum Xstephanense	3233 36 42
Juanulloa aurantiaca	1 13 18 24
Jubaea chilensis	13 18 20 24

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Juglans ailantifolia				18		24						
Juglans nigra			12	18	20	24	2829		34			
Juglans regia	1	34 6		171819		222324		32				
Juniperus bermudiana	1	6	13	18	20	24		33				
Juniperus chinensis	1			18		24		3233	36		41	47
Juniperus communis	1	56	13	18		24		323334	36	3839	4142	4445 4748
Juniperus conferta	1										41	4748
Juniperus deppeana											41	47
Juniperus excelsa	1	6	13	18								
Juniperus horizontalis	1	5	13	18	20	24					4142	48
Juniperus oxycedrus	1	6	13	18								
Juniperus phoenicea			13	18								
Juniperus procera								33	36	3839	4142	4445 48
Juniperus recurva	1										41	
Juniperus sabina	1		13	18	20	24		3233	36		41	4748
Juniperus scopulorum											41	
Juniperus squamata											41	
Juniperus virginiana	1	6	13	18	20			33			4142	
Juniperus Xmedia											41	47
Justicia adhatoda	1	3 6	1213	18	20	24	272829	31323334				
Justicia brandegeana										3839	41	4445 48
Justicia carnea	1	6	1213	18		24	2829	323334		38		
Justicia cydoniifolia			13	18		24						
Justicia ghiesbreghtiana	1											
Justicia rizzinii		9	12	18		24	28	32				
Justicia spicigera				18								
Kalanchoe marmorata								323334				
Kalanchoe pinnata	1											
Kalmia angustifolia				18		24		33				
Kalmia latifolia				18		24		33	36			45
Kennedia barklyana												46
Kennedia nigricans		6	13	16 18	2022	24	26272829	31323334	36			46
Kennedia prostrata				16 18	20							4546
Kennedia rubicunda		68		16 18	20	24	26272829	31323334	36	383940		4546
Kerria japonica	1	34	12		20	24	272829	31323334	36			
Koelreuteria paniculata	1			18		24	28	3233343536		3839	42	4445

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Kolkwitzia amabilis								34	36	3839		45
Kunzea amabilis								33	35			
Kunzea baxteri										40		4546 48
Kunzea peduncularis												47
Kunzea recurva												46
Kunzea sericea										40		
Kydia calycina	1											
Laburnum alpinum	1	345										
Laburnum anagyroides	1	345	1213	18	20	24	2829	32333435				
Laburnum Xwatereri								33	36	3839	41	4445
Lagerstroemia indica	1		12	18	20	24	272829	313233343536		3839	42	44 48
Lagunaria patersonii	1	34 10	12	18	20	24	26272829	3132333435363		3839	42	444546 48
Lambertia formosa			16		20			33				
Lantana camara	1	3 6	12	18	20	24	26272829	31323334	36	3839	42	44 48
Lantana crocea	1	6	12					33				
Lantana montevidensis	1		12	18	20	24	26272829	31323334	36	3839	4142	44 4748
Lantana trifolia	1											
Lapageria rosea			13	18		24	28	3233				
Lardizabala biternata	1			18		24	28					
Larix decidua			14	18	20	24		3233	3536			
Larix kaempferi				18								
Lasiopetalum ferrugineum			16									
Latania lontaroides			13	18		24						
Laurus nobilis	123	56	12	18	2022	24	272829	313233343536		3839	42	4445
Lavandula angustifolia	34	6	1213	18	20	24	26272829	31323334	36	3839	4142	4445 4748
Lavandula dentata			12	18	20	24	26272829	31323334	36	3839	42	4445 4748
Lavandula multifida								33				
Lavandula stoechas	1											
Lawsonia inermis	1											
Lechenaultia biloba												47
Lechenaultia formosa												47
Leonotis leonurus	3	5	12	18	20	24	2829	313233343536		3839	42	4445
Leptolepia novae-zelandica			16									
Leptomeria acida			16									
Leptomeria billardieri			16									
Leptospermum ericoides			16		20							

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Leptospermum flavescens	1											4647
Leptospermum juniperinum												47
Leptospermum laevigatum				18				3233	36373839	42	444546	48
Leptospermum lanigerum				18					36		46	
Leptospermum nitidum												47
Leptospermum petersonii										42		
Leptospermum rotundifolium												47
Leptospermum scoparium			16		20	24	272829	31323334	36	3839	41 4445	48
Leucaena glauca	1											
Leucodendron adscendens										40		
Leucodendron argenteum	3			18	20	24	28	3233	36	3940	4445	
Leucodendron discolor								33	36			
Leucodendron grandiflorum								33	36	40		
Leucodendron laureolum												47
Leucodendron venosum										40		
Leucodendron xanthaconus												47
Leucophae candicans						24						
Leucopogon lanceolatus			16									
Leucospermum album										40		
Leucospermum cordifolium												47
Leucospermum nutans										40		
Leucospermum reflexum										40		
Leucospermum tottum										40		
Leucostegia pallida		13	16	18								
Leucothoe fontanesiana								3233				
Leycesteria formosa	1	12		18								
Ligustrum indicum				18		24	28					
Ligustrum japonicum	1 56 9	12		18	20	24	28	32				
Ligustrum lucidum	1 6 9			18	20	24	28	32333435		3839	42	
Ligustrum ovalifolium	9	12		18	20	24	272829	31323334	36	3839	42	44
Ligustrum sinensis				18	20	24	26272829	313233343536			44	48
Ligustrum tschonskii				18		24						
Ligustrum undulatum	9											
Ligustrum vulgare	1 34 6 9	1213		18	20	24	2829	34				
Limonium arborescens		1213		18	20	24	28					
Limonium perezii											4445	

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Linospadix monostachya	13 18
Liquidambar styraciflua	1 18 20 24 2829 313233343536 3839 42434445 48
Liriodendron tulipifera	12 18 20 24 3233 3536 39 45
Lithocarpus glaber	1
Lithodora diffusa	24 28 3233 41
Livistona australis	1 3 13 18 20 24 272829 31 34
Livistona chinensis	20
Livistona humilis	1
Livistona mariae	24
Lobivia ferox	1
Lomatia silaifolia	16
Lonicera caprifolium	1 3 9 1213 18 20 24 272829 31323334 36 3839 4445
Lonicera ciliosa	9 18 24 2829 31323334
Lonicera etrusca	18 24 28 3233 36
Lonicera flava	1
Lonicera implexa	1
Lonicera japonica	1 3456 13 18 20 24 272829 31323334 36 3839 42 4445 48
Lonicera ledebourii	24
Lonicera morrowii	18 24
Lonicera nitida	31323334 41 4445 48
Lonicera pyrenaica	12
Lonicera sempervirens	1 4
Lonicera spinosa	18 24 28
Lonicera standishii	9 18 24 28
Lonicera tatarica	13 18 24 28 3233
Lonicera Xbrownii	18
Lotus berthelotii	18 24 28 323334 39 41 4445 4748
Lotus jacobeus	1 15 18 20
Luculia grandifolia	39 45
Luculia gratissima	1 29 3233343536 39 45 47
Lucuma obovata	1
Luma apiculata	13
Lycium afrum	24
Lycium chinense	18
Lycium europaeum	3
Lycium ferocissimum	9 13 18 20

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Lygodium circinatum	18
Lygodium polymorphum	18
Lygodium scandens	13 16 18 20 29
Maba laurina	1
Macadamia integrifolia	12 18 20 24 33343536 38 4445
Macadamia ternifolia	28
Macfadyena unguis-cati	1213 18 20 24 29 3233 36 3839 42 4445
Mackaya bella	9 13 18 20 24 28 3233
Maclura pomifera	1 3 1213 18 20
Macrozamia communis	4 13
Macrozamia miquelii	13 18
Macrozamia spiralis	13 18 20
Magnolia acuminata	1 9
Magnolia campbellii	12
Magnolia co'co	1
Magnolia grandifolia	123 6 9 12 18 2022 24 26272829 31323334 36 3839 42 4445 48
Magnolia heptapeta	12 9 12 18 20 24
Magnolia hypoleuca	18 24 3233 36
Magnolia kobus	18 24 32
Magnolia quinquepeta	123 9 12 18 24 3233 36
Magnolia stellata	18 24 3233
Magnolia Xsoulangiana	1 9 12 33 47
Magnolia Xthompsoniana	1
Magnolia Xwatsonii	18
Mahonia aquifolium	3 9 12 20 24 28 33
Mahonia bealei	13 18 24 3233 3536 39 45
Mahonia fortunii	1
Mahonia japonica	1 24 33
Mahonia pinnata	1
Malpighia coccigera	18
Malus baccata	1
Malus floribunda	18 20 323334 36 3839 43
Malus halliana	18 24
Malus ioensis	3839 4344
Malus spectabilis	1 18 20 24 31323334 36 3839 4344
Malus Xdomestica	123456 13 17181920222324 26272829 313233343536 3839 43 45

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Malus Xgorgeous									36	3339		4344
Malus Xmagdeburgensis									36	39		
Malus Xpurpurea								3233	36	3839		4344
Malus Xscheideckeri								3233				
Malvaviscus arboreus	1	9	1213	18	20	24	28	3233	3536			
Mandevilla boliviensis				18		24						
Mandevilla laxa	1	6	13	18	20	24	2627 29	313233343536		3839		4445
Manettia cordifolia		6	13	18		24	28					
Manettia inflata				18	20	24	28			39		45
Marattia salicifolia				18								
Medicago arborea	34											
Melaleuca acuminata						24	28					
Melaleuca alternifolia									37			
Melaleuca armillaris										39	42	4445464748
Melaleuca bracteata												47
Melaleuca brevifolia												46
Melaleuca decora				18		24	28	3233				
Melaleuca decussata											42	46
Melaleuca diosmifolia				18		24	28					45464748
Melaleuca eleuterostachya												46
Melaleuca elliptica						24	28				42	4546
Melaleuca ericifolia			13	18		24	28					46
Melaleuca erubescens												46
Melaleuca exarata												46
Melaleuca fulgens									37	40		4546
Melaleuca gibbosa								32	37			
Melaleuca glomerata												46
Melaleuca halmaturorum			13	18		24	28					46
Melaleuca hamulosa												46
Melaleuca hypericifolia		9	1213	18	20		28	3233	36	3839	42	4445464748
Melaleuca incana									37		42	45464748
Melaleuca lanceolata									36	39	42	444546
Melaleuca lateritia				18				34	36	39		4546
Melaleuca laxiflora				18		24				39		45
Melaleuca leucadendron			16		20	24	29			39	42	45
Melaleuca linariifolia												46

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Melaleuca macronychia	46
Melaleuca megacephala	46
Melaleuca micromera	9 1213 18 20 24 28
Melaleuca nesophila	42 4445464748
Melaleuca nodosa	18
Melaleuca pentagona	46
Melaleuca preissiana	18 24 28
Melaleuca quadrifaria	46
Melaleuca radula	37 46
Melaleuca scabra	46
Melaleuca squamea	9 1213 18 24 28
Melaleuca steedmanii	36 42 46
Melaleuca styphelioides	13 20 3233 36 39 42 444546
Melaleuca suberosa	40
Melaleuca thymifolia	18 24 28 32 45
Melaleuca wilsonii	9 24 28 42 4546
Melastoma malabathricum	9
Melia azedarach	1 3 56 910 1213 18 20 2425 2728293031323334353637 39 42 4445
Melianthus major	1 3 9 13 15 18 20 24 28
Melianthus minor	1 6 9 13 18 24 28
Melicope ternata	1213 18 24 28
Melicytus ramiflorus	16
Menispermum canadense	18 24 28
Meryta denhamii	13 18 24
Meryta latifolium	1213 18 20
Mespilus germanica	123456 13 17181920 24 28 43
Metrosideros carmineus	39
Metrosideros excelsus	9 13 16 20 29 323334 36 3839 42 4445 4748
Metrosideros robusta	12
Metrosideros umbellatus	33
Metternichia princeps	1
Michelia figo	1 3 9 12 18 24 33 36 3839 42 45
Microcoelum weddellianum	18 20
Microlepia pyramidata	9 13 16 18
Microstrobos fitzgeraldii	41
Mimosa sensitiva	8 13 15 18 20 24

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Mimulus aurantiacus	1 13 18 20 24 26272829 31323334 36 3839 42 45
Mimulus puniceus	1 38 42 44
Mirbelia rubiifolia	16
Mirbelia speciosa	1 16
Miscanthus nepalensis	18 24
Miscanthus sinensis	11 13 15 18 2022 24 3233
Mitraria coccinea	1213 18 20
Mitriostigma axillare	13
Monotoca scoparia	16 20
Monstera deliciosa	18 20 24 28 34 38 42 4445 48
Monstera friedrichsthalii	38 48
Morus alba	1 3 5 89 121314 17181920 24 2829 34
Morus nigra	1 34 689 1213 17181920222324 26272829 31323334 38 43 45
Morus rubra	3
Muehlenbeckia australis	13 33
Muehlenbeckia axillaris	41
Muehlenbeckia complexa	34 38
Mundia spinosa	9 1213
Muraltia heisteria	1 9 1213
Murraya paniculata	1 13 48
Musa acuminata	5 11 13 18 24 28
Musa coccinea	24
Musa Xparadisiaca	34 6 20 2324 26272829 31323334 39 48
Myoporum floribunda	41
Myoporum insulare	6 9 1213 16 18 20 26272829 3132333435363738 42 4546
Myoporum parvifolium	4142 44454647
Myoporum platycarpum	46
Myrciaria floribunda	3 6 1213 18 24
Myrica californica	12
Myrica cerifera	12
Myrica cordifolia	13 18
Myrica rubra	18 24
Myrsine urvillei	34
Myrtus communis	1234 6 9 1213 18 2022 24 26272829 3132333435 38 4142 44 48
Nandina domestica	1 9 1213 18 20 24 28 313233343536 3839 4142 4445 4748
Napoleona imperialis	1

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Nematanthus longipes	1 9
Neopanax arboreus	20 24 42
Neopanax laetus	44
Nerium oleander	123456 9 1213 18 20 24 26272829 313233343536 3839 42 4445 47
Nicodemia diversifolia	18 24 28 48
Nierembergia scoparia	89 13
Noltea africanus	3 89 1213 15 18 20 24
Nopalea cochenillifera	1 34
Notelaea ligustrina	12
Notelaea longifolia	9 13 16
Nothofagus cunninghamii	1 18 24
Nyssa sylvatica	36
Ochna atropurpurea	18 20 24 2829 3233343536 39 42 4445
Ochrosia elliptica	24 28
Ochrosia moorei	24 28
Olea europaea	123456 9 121314 17181920 24 28 33 42 45
Olearia argophylla	1 3 1213 16 18 24 28
Olearia frostii	18 24 28
Olearia ilicifolia	16
Olearia teretifolia	24
Olearia tomentosus	16
Olearia Xhaastii	16
Omalanthus populifolius	12 18 24 3839 42 4445
Opuntia brasiliensis	3
Opuntia ficus indica	1
Opuntia imbricata	9
Opuntia leptocaulis	33
Opuntia microdasys	3 33
Opuntia pentlandii	13
Opuntia robusta	13
Opuntia tuna	3 13
Opuntia vulgaris	3
Oreopanax reticulatus	12 20 24 28
Orphium frutescens	12
Osmanthus americanus	1 9 1213 20 24 28
Osmanthus fragrans	9 1213 18 20 24

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Osmanthus heterophyllus	9 1213 18 20 24 28 32 45 47
Osmaronia cerasiformis	18 24
Osmunda regalis	13 16 18 20
Osteospermum barberae	4142
Osteospermum ecklonis	41
Osteospermum fruticosum	4142 44 4748
Oxera pulchella	13 18
Oxylobium callistachys	9 13
Oxylobium trilobum	16 20
Pachysandra terminalis	24 41
Pachystachys coccinea	1
Pachystachys lutea	48
Paeonia officinalis	1 3 6 13 18 20 24 33
Paeonia suffruticosa	1 3 6 9 1213 18 20 24 3233
Paliurus spina-christi	1
Pandanus baptistii	18 24
Pandanus dubius	18 24
Pandanus odoratissima	9
Pandanus utilis	9 13 20 24
Pandanus veitchii	9 13 18 20 24
Pandorea jasminoides	1 34 1213 18 2022 24 26272829 31323334 44
Pandorea pandorana	3 8 1213 16 18 2022 24 26272829 31323334 36 39 45 48
Parkinsonia aculeata	13 18 42
Parthenocissus henryana	2022 24 262728 313233 36
Parthenocissus quinquefo.	1213 15 18 2022 24 26272829 3132 34 36
Parthenocissus tricuspid.	1213 15 18 2022 24 2627 29 313233343536 3839 42 44 48
Passiflora alata	1 3 6 13
Passiflora alba	1 5 13 18
Passiflora antioquiensis	13 18 24 28 33 44
Passiflora bahnii	18
Passiflora banksii	6 13 18 24
Passiflora caerulea	1 3 6 13 18 20 24 2627 29 31 33
Passiflora coccinea	1
Passiflora edulis	1 34 68 13 15 17181920 2324 26272829 313233343536 3839 42 4445 48
Passiflora foetida	1
Passiflora herbertiana	1

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Passiflora incarnata	1			18								
Passiflora manicata	1		13	18	2022	24	26272829	31323334	36	39		45
Passiflora mixta				18			26					
Passiflora mollissima			13	18	2022	24	26272829	31323334	36	3839	42	4445
Passiflora pinnatistigma	1 3											
Passiflora quadrangularis		9	13	18	20	24						
Passiflora racemosa	1	6	13	18	20	24	28					
Passiflora raddiana	1											
Passiflora serratifolia	1											
Passiflora stipulata		6										
Passiflora trifasciata		9	13	18								
Passiflora XDecaisneana			13									
Passiflora Xexoniensis			13	18	20	24	26272829	3132	34			
Passiflora Ximperatriceeug.			13	18	20	24	26272829	3132				
Passiflora Xloudoni	1		13	18	20							
Passiflora Xracemosa/caer	1 34	6		18								
Paulownia tomentosa	1	9	1213	18	20	24	2829	33	36			
Pavetta caffra				18		24	28					
Pavetta indica			13	18		24	28					
Pavonia hastata		9		18		24	28					
Pedilanthus tithymaloides	1										42	
Pentas lanceolata	1											
Pereskia aculeata	3	9	13	18	20	24	28	3233			42	45
Periploca graeca	1		13			24	28					
Pernettya mucronata				18		24	28				41	
Persea borbonia	1											
Persoonia hirsuta				16	20							
Persoonia lanceolata				16	20							
Persoonia linearis				16	20	24						
Persoonia pinifolia				16	20	24		33				
Petrea volubilis	1	6										
Petrophile diversifolia				16								
Phebalium squamulosum				16								
Philadelphus coronarius	1 3	9	1213	18	20	24	272829	31323334	36			
Philadelphus coulteri				18		24						
Philadelphus inodorus	1	9	13	18	20	24	272829	31323334	36			

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Philadelphus lewisii		9	1213									
Philadelphus mexicanus		9	1213	18		24	28					
Philadelphus pubescens	1	9	13									
Philadelphus Xfalconeri				18		24						
Philadelphus Xlemoinei				18		24						
Philadelphus Xvirginalis										3839		45
Phillyrea angustifolia	1	9	1213	18		24	28				44	
Phillyrea latifolia			1213	18		24	28					
Philodendron bipinnatifidum						24						
Philodendron erubescens										38	44	
Philodendron grandifolium				18		24	28			3839	42	
Philodendron imbe											4445	
Philodendron selloum										3839	42	4445 48
Philodendron verrucosum		9										
Philodendron Xcorsinianum				18								
Philotheca salsolifolia				16	20							
Phlogacanthus asperulum	1											
Phoenix canariensis			13		20	24	272829	31323334		38	42	44 4748
Phoenix dactylifera	1 34 6		13	18	20	24	2829					
Phoenix pusilla						24						
Phoenix reclinata			13	18	20	24	2728	31 34			42	
Phoenix roebelenii					20	24	272829	313233		38	44	48
Phoenix rupicola			13	18	20	24	28					
Phoenix sylvestris			13	18	20							
Phormium colensoi		9	13	18		24					41	
Phormium tenax	1 3 6	9	1213	16 18	20	24	2829	3233			4142	44 47
Photinia glabra								3233343536		3839	42	4445 4748
Photinia serrulata		9	1213	18	2022	24	272829	313233343536		3839	44	
Phygelius capensis			13	15 17181920		24	26272829	31323334				
Phyllocladus asplenifoliu	1 3											
Phyllocladus trichomanoid	1											
Phyllostachys aurea				18		24			36			
Phyllostachys bambusoides				18		24						
Phyllostachys nigra	1		1213	18	20	24	28	3233	36			
Phyllostachys quiloi						24						
Physalis peruviana	4		13	18	20		29					

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Physocarpus opulifolius				18		24						
Phytolacca americana		9	13	18		24						
Picea abies	1	6			20	24		3233	36	39	41	
Picea glauca	1					24		3233			41	47
Picea mariana						24						
Picea morinda	1			18		24		33	36			
Picea orientalis						24		32				
Picea pungens				18		24		3233	3536	3839	4445	47
Picea rubens		6				24						
Picea sitchensis						24		3233			44	
Picea smithiana			13		20							
Pieris japonica						24		3233	3536		41	45 47
Pimelea ferruginea		9	1213	18	20	24	262728	313233	3536		41	45464748
Pimelea linifolia		9		16	20							
Pimelea rosea			12							39	42	
Pimelea spectabilis							28				41	
Pinus attenuata			13									
Pinus canariensis	12	5	13	16	20	2425	2728293031323334		36373839		42	444546
Pinus cembroides	1											
Pinus contorta			13									
Pinus coulteri	1		13	18	20		29					
Pinus densiflorus				18								
Pinus gerardiana	1	6										
Pinus halepensis	1	56 10	13	16	18	2022	2425	2728293031323334		36373839	42	444546 48
Pinus jeffreyi			13									
Pinus massoniana				18								
Pinus maximinoi	1											
Pinus montezumae	1											
Pinus mugo			13	18	20		29				41	
Pinus muricata	1			18								
Pinus nigra		5	13		20							
Pinus palustris	1											
Pinus pinaster	1	3 56 10	1314	18	20	2425	2728293031323334		36			46
Pinus pinea	1	3 56 10	13	18	20	2425	2728293031323334		3637		42	46
Pinus ponderosa		6	13	18		24						
Pinus ponderosa												

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Pinus pseudostrobus	1
Pinus pungens	1
Pinus radiata	6 10 13 16 18 2022 2425 272829303132333436373839 42 444546
Pinus roxburghii	12 5 13 18 20 24 3233
Pinus sabiniana	1 13 18
Pinus strobus	6 13 18
Pinus sylvestris	56 13 18 20
Pinus taeda	1
Pinus teocote	1
Pinus torreyana	13
Pinus wallichiana	12 6 13 18
Piper kadsura	3839
Pisonia umbellifera	9 1213 18 24 28
Pistacia chinensis	36 39 45
Pistacia lentiscus	1
Pistacia vera	18
Pittosporum bicolor	6
Pittosporum crassifolium	9 12 18 24 28 36 3839 42 44 46 48
Pittosporum eugenioides	1 6 9 1213 1516 18 20 24 272829 313233343536 3839 42 44 4748
Pittosporum phillyraeoides	9 13 3233 3637 42 444546
Pittosporum revolutum	1 18
Pittosporum rhombifolium	9 12 44
Pittosporum rigidum	12
Pittosporum tenuifolium	1 9 1213 16 18 20 24 28 3839 42 44 48
Pittosporum tobira	1 9 1213 18 20 28 41 44 48
Pittosporum undulatum	1 6 9 1213 1516 18 20222324 26272829303132333435 3839 42 44 46 48
Pittosporum viridiflorum	6
Plagianthus regius	16 20
Platanus occidentalis	9 13 18 24 3233 36 39
Platanus orientalis	1 4 9 1213 18 20 24 272829 31323334 38 414243
Platanus Xacerifolia	25 30 45
Platycladus orientalis	1 3 56 13 18 20 24 2728 313233343536 3839 4142 4445 4748
Platylobium formosum	16 20
Plectranthus ecklonis	9 1213 18 20 24 28 32
Plumbago auriculata	1 6 9 1213 18 2022 24 26272829 313233343536 3839 42 4445 48
Plumbago indica	1 6 18 24

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Plumbago zeylanica	9 1213 18 24 28
Plumeria rubra	18 24 28 3839 42 4445
Podalyria calyptrata	1 9 1213 18 20 24 272829 31323334 36 3839 4445
Podalyria sericea	1 3 6 9 1213 24 313233 36
Podocarpus alpinus	41
Podocarpus dacrydioides	1 3 20
Podocarpus elatus	13 18 24 28
Podocarpus elongatus	13 18 24
Podocarpus ferrugineus	16
Podocarpus macrophyllus	13 18 24
Podocarpus neriifolius	1 3
Podocarpus nubigenus	13 18 24
Podocarpus spinulosa	6 13 18 20 24 32
Podocarpus totara	13 18 20 24 28 32
Podranea brycei	36
Podranea ricasoliana	1213 18 2022 24 272829 31323334 36 3839 44 48
Polygala chamaebuxus	6 24 4748
Polygala myrtifolia	1 3 6 12 44
Polygala oppositifolia	1 3 6 12
Polygala virgata	1 3 6 12 16 20 34 36
Polygala Xdalmaisiana	12
Polygala Xpalmatus	12 22 2627 3132 34 3839 42 45
Polyosma cunninghamiana	1
Polyscias filicifolia	13 16 18
Polyscias guilfoylei	13 16 18 24
Pomaderris apetala	16 20
Populus angulata	12 33 36 39
Populus balsamifera	13 18 24
Populus canescens	10 1213 18 24 32
Populus deltoides	34 3637 39 4344
Populus nigra	1 56 10 1213 18 20 2425 27 29 31323334 36373839 43 47
Populus simonii	36 39 44
Populus tremula	1213 18 24 3233 38 42
Populus Xcanadensis	6 10 18 24 33 36 3839 4344
Populus yunnanensis	24 33 36 3839 44
Portulacaria afra	39 42 4445

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Prestonia venosa	1
Pritchardia gaudichaudii	24 28
Prostanthera incisa	36
Prostanthera lasianthos	24
Prostanthera nivea	13
Prostanthera ovalifolia	3233 36 383940 4445 47
Prostanthera rotundifclia	1213 18 24 3233
Prostanthera sieberi	18 33 36 454647
Prostanthera spinosa	12 40
Prostanthera violacea	16 20
Prostanthera Xpoorindadavidi	48
Protea barbigera	33
Protea compacta	36 40
Protea cynaroides	24 3233 40
Protea grandiceps	33
Protea latifolia	33 36 40
Protea laurifolia	33 40
Protea lepidocarpodendron	36
Protea longifolia	33 36 40
Protea mellifera	1 1213 18 20 24 2829 313233343536 383940 4445
Protea nana	1
Protea neriifolia	40
Protea pulchella	33 36
Protea subpulchella	40
Protea susannae	3233 36
Prunus armeniaca	123456 13 1718 20222324 26272829 313233343536 3839 43 45
Prunus avium	123456 13 1718 20222324 26 2829 313233343536 3839 43 45
Prunus cerasifera	13 17181920 24 26272829 31323334 36 3839 434445
Prunus cerasus	1
Prunus domestica	123456 13 17181920222324 27 2930 33343536 3839 43 45
Prunus dulcis	123456 13 1718 20222324 26272829 313233343536 3839 43
Prunus glandulosa	1213 17181920 24 26272829 31323334 36 3839 4344
Prunus ilicifolia	1 1213
Prunus insititia	27 39
Prunus japonica	18 24 38 43
Prunus laurocerasus	1 34 1213 18 20 24 28 3233 36

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Prunus lusitanica	1 1213 18 20 24 28 3233 36
Prunus mume	272829 31323334 36 3839 44
Prunus persica	123456 1213 17181920222324 26272829 313233343536 3839 434445
Prunus serotina	18 24 32
Prunus serrulata	9 13 18 24 27 313233343536 3839 4344
Prunus triloba	18 24 33 43
Prunus Xblireiana	24 272829 31323334 36 3839 4344
Prunus Xpollardii	34 38 4344
Pseuderanthemum bicolor	1 13 18
Pseuderanthemum variable	1213
Pseudopanax crassifolium	13 18 24 42
Pseudopanax lessonii	42
Pseudotsuga menziesii	13 18 20 24 3233 36 39 44
Psidium guajava	1 34 6 1213 18 20 24 282930 323334 36 3839 45
Psidium littorale	1 34 6 1213 17181920 24 272829 31323334 36 3839 42 4445 48
Psoralea aphylla	1 3 13 18
Psoralea pinnata	33 3536 3839 42 4445 48
Ptelea trifoliata	18 24
Pueraria lobata	20 29 34
Pultenaea capitata	16
Pultenaea daphnoides	16 20
Pultenaea retusa	16 20
Pultenaea stipularis	16
Pultenaea stricta	16 20
Punica granatum	1 34 6 1213 17181920222324 26272829 313233343536 3839 4142 4445 48
Pyracantha angustifolia	3334 36 3839 42 44 48
Pyracantha atalantioides	33 36 3839 42 4445
Pyracantha coccinea	1 3 12 18 2022 24 27 29 31 3334 36 3839 42 4445
Pyracantha crenulata	18 24 272829 31323334 36
Pyracantha koidzumii	24
Pyracantha rogersiana	3233 36 38 42
Pyrostegia venusta	1 1213 18 2022 24 26272829 31323334 36 3839 42 44
Pyrus communis	1234567 13 17181920222324 2627 29 313233343536 3839 43 45
Quercus agrifolia	1
Quercus bicolor	1
Quercus cerris	1 18 24

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Quercus coccinea	1		12	18		24		3233				
Quercus falcata	1					24						
Quercus glauca				18		24						
Quercus ilex	1		1213	18	20	24	28	3233	3637	39	44	
Quercus leucotricophora	1											
Quercus lusitanica				18		24		3233	36	39		
Quercus macrocarpa												
Quercus macrolepis	1											
Quercus marilandica	1											
Quercus palustris	1			18		24		33	36	39	4344	
Quercus petraea	1											
Quercus phillyraeoides						24	28					
Quercus prinus	1											
Quercus reticulata	1											
Quercus robur	1	3 5 10	121314	18	20	2425	282930	323334	3637	39		
Quercus rubra				18		24		3233	36			
Quercus suber	1		13	18	20	24		32		39		
Quercus velutina	1											
Quercus virginiana	1		12									
Quisqualis indica	1	6		18		24				39		
Randia malleifera	1											
Rapanea variabilis		9	12									
Raphiolepis indica	1		1213	18		24	28		36			
Raphiolepis umbellata			1213	18	20	24	26272829	313233343536		3839	42	4445 4748
Raphiolepis Xdelacourii										3839	42	4445 47
Regelia ciliata												46
Reinwardtia Indica	1											
Rhagodia hastata				18	20	24	28	3233	3536			
Rhagodia spinescens												46
Rhamnus alaternus	1	34 8	1213 15	18	20222324		2829	32 34				
Rhapis excelsa			13	18	20	24	272829	31323334				
Rhodochiton atrosanguineu				18	20		29					
Rhodotypos scandens				18		24						
Rhopalostylis baueri				18	20							
Rhopalostylis sapida			13	18	20							
Rhus chinensis				18								

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Rhus copallina				18								
Rhus coriaria				18								
Rhus lancea												46
Rhus lucida	1											
Rhus radicans				18								
Rhus succedanea			12	18	20	24	272829	31323334	36	3839	4445	
Rhus typhina	3		13	18		24		3233				
Rhus verniciflua				18		24						
Rhus vernix			12									
Ribes aureum	1 3 56		1213	18	20	2324	26272829	3132	34	36		
Ribes sanguineum	1 3 5		1213	18	20	24	272829	31323334	36	3839	42	44
Ribes sativum	4		13	18								
Ribes speciosum	1		1213	18	20	23	2627	29	313233343536	38	43	
Ribes uva-crispa	3456		13	17	18	19	20222324	26272829	313233343536	3839	43	45
Ricinocarpos pinifolius					20							
Ricinus communis	8		15	18	20	24	29	33				
Rivina humilis			13	18	20	24						
Robinia hispida	1 345		1213	18	20	24	27	313233				
Robinia kelseyi								323334				
Robinia pseudoacacia	1 34	10	1213	18	20	2425	272829	31323334				
Robinia Xambigua					20							
Romneya coulteri	8		15	18	20	24	26272829	31	34	39	41	
Rondeletia amoena			13							38	42	44
Rondeletia anomala				18								
Rondeletia odorata	1	9	13	18		24	28					
Rosmarinus officinalis	3456		1213	18	20	24	272829	313233343536		3839	4142	44 4748
Rothmannia globosa			12	18		24						
Rothmannia longifolia	1											
Royena lucida				18		24	28					
Royena villosa	1		13	18			28					
Rubus fruticosus				17	19	20	2324	2627	29	313233343536	38	
Rubus idaeus	1 3456		1213	17	18	19	20	24	2627	29	313233343536	3839	43	45
Rubus odoratus	34											
Rubus phoenicolasius						20						
Rubus ursinus				18	20	24	26272829	313233343536		3839	41	43 45
Rudbeckia fulgida				18	20		29					

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Rudbeckia laciniata	20 24 323334 41
Ruellia elegans	1
Ruellia herbstii	13 18 24 28
Ruellia macrantha	10 24 28
Ruscus aculeatus	18 20 24 28
Russelia equisetiformis	1 6 1213 18 20 24 26272829 31323334 36 3839 42 4445 48
Russelia Xlemoinei	1213 3233
Ruta graveolens	3 13 18 20 24 28
Sabal blackburniana	13 18 20 24 28
Sabal minor	20
Saccharum officinarum	34
Salix alba	1213 18 20 24 3233 353637 38 434445
Salix babylonica	1 3456 10 121314 18 20 2425 282930 323334 36373839 42434445 47
Salix caprea	13 24
Salix chilensis	42 44 47
Salix fragilis	1 18 24
Salix glauca	12
Salix matsudana	434445
Salix purpurea	34 18 24 41
Salix repens	41
Salix rosmarinifolius	13 18
Salix sericea	24
Salix triandra	12
Salix viminalis	1 10 25 30
Salix Xmultinervis	24
Salix Xrubra	18 24 2829 31323334
Salvia aurea	5 13 18 24 28 33
Salvia azurea	13 18 20 27 323334 41
Salvia bracteata	6
Salvia canariensis	13
Salvia candelabrum	13
Salvia coccinea	1213 15 18 20 3233 36
Salvia elegans	13 18 24 32
Salvia grahamii	13 18 20 24 27 29 31323334
Salvia ianthina	1213 18 20 24 2829
Salvia involucrata	13 18 20 24 272829 31323334 36

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Salvia leucantha	13 18 24 28 323334 41
Salvia officinalis	34 13 16 18 20 24 2728 32333435
Salvia roemerianana	13 18
Salvia splendens	1 68 1213 15 18 20 27 29 3334
Salvia uliginosa	41
Salvia Xbonfire	18 20
Sambucus nigra	1 3456 1213 18 2022 24 28 3233 39 4445
Sambucus pubens	13 24
Sambucus racemosa	16 18 24
Santalum acuminatum	16 20
Santalum album	16
Santolina chamaecyparissus	13 18 24 3233 41
Santolina neapolitana	41
Sapindus marginatus	1
Sapium sebiferum	1 29 3233343536 39 45
Saxegothaea conspicua	1
Schefflera arboricola	48
Schinus molle	1 121314 18 2022 2425 272829303132333435 36 3839 42 444546 48
Schinus polygamus	1 18 24 28
Schinus terebinthifolia	1 20 45
Schotia afra	1 18 20 24 28 36 39
Schotia brachypetala	12
Schotia latifolia	1 13 18 24 28
Sciadopitys verticillata	18 24 41
Scindapsus aureus	38 42 44 4748
Scindapsus pictus	9
Scolopia brownii	13 18
Selenicereus grandiflorus	1 4 9 13 20
Selenicereus macdonaldiae	5
Selenicereus pteranthus	13
Senecio mikanioides	13 18 20 24 28 32 38 45
Senecio serpens	41
Sequoia sempervirens	1 13 18 24 30 3233 36 39
Sequoiadendron giganteum	6 13 18 20 24 3233
Serissa foetida	1213 18 24 28 39 48
Sesbania grandiflora	1

	1850 - 1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Sesbania punicea		13	18								
Sesbania tripetti						272829	313233343536		3839		4445
Shepherdia argentea	1										
Sibiraea laevigata	1										
Skimmia japonica			18		24		33				
Smilax glauca	1	13									
Smilax glycophylla		16		20							
Solandra grandiflora		13	18		24	28					
Solandra guttata		13	18		24	28					
Solandra maxima									3839	42	4445
Solanum atropurpureum			18								
Solanum aviculare	3	13	15 18		24						
Solanum capsicastrum		1213	18	20	24	28	323334				
Solanum dulcamara	3	13	18								
Solanum giganteum	6										
Solanum hendersonii						28					
Solanum hispidum			18		24						
Solanum jasminoides	1 5	13	18		24	28	3233				47
Solanum pseudo-capsicum		13	1516 18		24						
Solanum rantonnetii		13	18	20	24	26 2829	31323334	36	3839	42	4445
Solanum robustum			15								
Solanum seaforthianum			18	20	24	272829	313233				
Solanum simile		12									
Solanum wendlandii			18	20	24	2728	313233343536		38		
Sollya heterophylla		1213	18	20	24				39		454647
Sollya parviflora			18								
Sophora japonica	1	13	18	20	24	28	323334				45
Sophora microphylla		1213	16 18	20	24	28					
Sophora secundiflora			18		24	2829	3334				
Sophora tetraptera	1 3	1213	16	20	24	28	3435		38	42	44
Sorbaria aitchisonii											
Sorbaria grandiflora		1213	18	2022	24	26272829	31323334				
Sorbaria sorbifolia	6	1213	18	20	24	28					
Sorbus aucuparia	1	13	18	20	24	29	3233343536		38	43	45
Sorbus sambucifolia											45
Sparmannia africana	1	1213	18	20	24	26272829	313233343536		39		4445

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Spartium junceum	3		13		18	20	24	26272829	3132333435	38	42	4445
Sphaeropteris cooperi			13	16	18	20		29				
Sphaeropteris medullaris		9		16								
Spiraea bella					18		24					
Spiraea blumei			13		18		24					
Spiraea cantoniensis			1213		18	2022	24	2627 29	31323334 36	3839	42	44 48
Spiraea chamaedryfolia							24					
Spiraea corymbosa	1	3456	1213		18	20	24	2627 29	31323334 36	3839		44
Spiraea densiflora												
Spiraea douglasii	1	6	1213		18	20	24	27	31			
Spiraea hypericifolia	1											
Spiraea japonica			1213		18	20	24		32			
Spiraea prunifolia	1		1213		18	20	24	28	33			
Spiraea salicifolia			13									
Spiraea thunbergii			1213						33 36			
Spiraea tomentosa	1											
Spiraea Xbumalda					18	20	24	2627 29	31323334 36	3839	42	44
Spiraea Xfontenaysii					18		24					
Spiraea Xmultiflora					18		24					
Spiraea Xsanssouciana					18		24					
Sprengelia incarnata				16	18							
Stachytarpheta mutabilis	1											
Stauntonia hexaphylla							24					
Stemona tuberosa	1											
Stenocarpus cunninghamii			13	16	18	20	24	28	313233343536	38	42	
Stenocarpus salignus			1213		18		24					
Stenocarpus sinuatus			1213							40		444546
Stephanandra hernandifolia			13									
Stephanotis floribunda	1	9	12		18	20	24	26272829	313233343536	3839	42	44
Stigmaphyllon ciliatum			13		18	20	24	272829	313233343536			
Strelitzia alba	1		1213		18		24	2829				
Strelitzia nicolai												44
Strelitzia reginae	1	6	1213		18	20	24	26272829	31323334 36	3839	42	4445 48
Streptosolen jamesonii			1213		18	20	24	272829	313233343536	39	42	4445 4748
Strobilanthes anisophyllu	1		1213		18		24	26272829	31323334	3839	4142	4445 4748
Strobilanthes dyeranus					18							48

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Strobilanthes glomeratus	1		13	18		24			34			
Strophanthus speciosus			12	18	20	24		32				
Styphelia trifolia				16	20							
Styphelia viridis				16	20							
Styrax japonicus				18		24						
Styrax obassia				18								
Sutera grandiflora								3233343536				
Sutherlandia frutescens	1 34 6		13	18		24	28					
Swainsona galegifolia			1213	18	20	24	26272829	3132	34			
Swainsona greyana				16	18	20	24					
Symphoricarpos albus			1213	18	20	24	272829	31323334	36	3839		4445
Symphoricarpos orbiculatus			13	18		24	28	323334	36	38		4445
Syncarpia glomulifera				16	18	20	29					
Syngonium angustatum				18		24						
Syngonium podophyllum												48
Synoum glandulosum	1											
Syringa emodi				18		24						
Syringa josikaea						24						
Syringa patula											41	
Syringa reticulata			1213	18		24						
Syringa villosa				18		24						
Syringa vulgaris	1 34 6		1213	18	2022	24	26272829	313233343536		3839	424344	
Syringa Xpersica	1 34 6		1213	18	20	24	26	3233	3536			
Syzygium coolminianum									36			
Syzygium floribundum			12			24		3233				
Syzygium malaccense	1											
Syzygium paniculatum		6	1213	18	20	24	2728	323334	36	39		
Tabebuia rosea					20		2627 29	31	34			
Tabernaemontana dichotoma	1 3			18								
Tabernaemontana divaricat.				18								
Tabernaemontana laurifoli.			13	18	20	24	28					
Tamarindus indica	1											
Tamarix aphylla									3536	3839	42	444546
Tamarix chinensis			1213	18	20	24	272829	313233343536		38	42	44
Tamarix gallica		10	1213	18	20	24252627282930		313233343536				
Tamarix ramosissima								33	3536	39		45

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Taxodium distichum	1 6 13 18 20 3233 3536 39
Taxodium mucronatum	1
Taxus baccata	12 56 13 18 20 24 3233 3536 39 41 4445 47
Taxus canadensis	18 24
Tecoma alata	1213 18 20 24 26272829 31323334 36 3839 42 4445
Tecoma fulva	9 13 18 24 28
Tecoma garrocha	39
Tecoma stans	1 9 1213 18 20 24 26272829 31323334 36 3839 42 4445
Tecomaria capensis	1 34 6 9 1213 18 20 24 26272829 313233343536 3839 42 4445 48
Tectaria moorei	9 13 18
Telopea speciosissima	1 16 18 20 24 29 323334 40 47
Templetonia glauca	1 9 1213
Templetonia retusa	9 1213 20 272829 313233343536 383940 42 444546 48
Tephrosia glomeruliflora	36
Tephrosia grandiflora	3 36
Ternstroemia gymnanthera	18 24 28
Tetrapanax papyrifera	20 24
Tetratheca ciliata	18
Tetratheca ericifolia	16 20
Teucrium fruticans	18 24 41
Teucrium marum	9 13 41
Thevetia peruviana	9
Thryptomene calycina	18 3233 36 3940 4647
Thryptomene Xpaynee	383940 42 4445464748
Thuja occidentalis	1 4 13 33 36 3839 4142 44
Thuja plicata	13 18 20 24 3233 36 39 47
Thuja plicata	13 18 20 24 3233 36 3839 47
Thujopsis dolabrata	13 18 20 24 3233 3536 41
Thunbergia alata	1 8 13 15 20 29 39 4748
Thunbergia coccinea	1 13 18 20 24 28
Thunbergia erecta	13
Thunbergia fragrans	1 18
Thunbergia grandiflora	18 24 28
Thunbergia gregorii	272829 31 3334 3839 4445
Thunbergia hawtayneana	9 13
Thymus herba-barona	41

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Thymus serpyllum	33 41 48
Thymus vulgaris	4 13 16 18 20 24 28 323334
Thymus Xcitriodorus	13 18 20 24 28
Tibouchina granulosa	18
Tibouchina heteromalla	1
Tibouchina urvilleana	12 18 20 24 272829 313233343536 3839 45 47
Tilia dasystyla	18
Tilia platyphyllos	4 18 24 33
Tilia tomentosa	18 24
Tilia Xeuropaea	1 3 12 18 20 24 33
Todea barbara	13 16
Toona australis	12 18 20 24 2829 33343536
Trachelospermum jasminoi	1 6 13 1718 20 272829 313233343536 3839 42 4445 48
Trachycarpus fortunei	13 18 20 24 28
Trichocereus chiloensis	1
Triplochlamys multiflora	13 18 24 28
Tristania conferta	6 12 18 20 24 29 3233343536 3839 42 4445464748
Tristania laurina	9 1213 45
Tsuga dumosa	1
Tsuga heterophylla	18
Tupidanthus calyptratus	18 24 28
Turnera ulmifolia	1
Tweedia coerulea	1 18 41
Ugni molinae	1213 18 20 24 28 41
Ulex europaeus	8 18 20
Ulmus carpinifolia	18 24 3233
Ulmus glabra	1 3 12 18 24 3233
Ulmus parvifolia	1 9 13 18 33 36 3839 42 44 48
Ulmus procera	1 3 56 10 1213 18 20 2425 282930 323334 36 3839 42434445 47
Ulmus Xhollandica	1 910 121314 18 20 2425 3233
Ulmus Xvegeta	9 13 18 24
Umbellularia californica	9 1213 20
Veronica formosa	9 13 24 28
Verticordia brownii	18 24
Verticordia densiflora	28
Viburnum carlcephalum	3233 36 3839

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Viburnum japonicum	1 9 1213 18 20 24
Viburnum lantana	18 24
Viburnum macrocephalum	1
Viburnum obovatum	1
Viburnum odoratissimum	1 9 1213 18 24 28 42
Viburnum opulus	1 9 1213 18 2022 24 26272829 313233343536 3839 4142 44 4748
Viburnum plicatum	1 18 24
Viburnum rigidum	1 9 1213 18 20 24 28
Viburnum sieboldii	9 1213 18 24
Viburnum suspensum	9 1213 18 20 24 2829 323334 42 48
Viburnum tinus	1 3 56 9 1213 18 2022 24 26272829 313233343536 3839 42 4445 4748
Viburnum Xburkwoodii	33343536 3839 42 44 4748
Vigna caracalla	13 15 18 20 24 26272829 313233343536 45 48
Viminaria juncea	16
Vinca major	1 6 13 18 20 24 3233 41 48
Vinca minor	1 3 68 1213 15 18 20 24 41
Virgilia capensis	1 3 20 272829 313233343536 3839 4445 4748
Virgilia divaricata	36 3839 45
Vitex agnus-castus	1 9 1213 18 20 24 28 32 42
Vitex lucens	36 39
Vitex negundo	13
Vitex trifolia	13 18 24 28 3233
Vitis amurensis	29 313233 3536 3839 44 47
Vitis coignetiae	18 24 28 33 3536
Vitis labrusca	1
Vitis vinifera	123456 1314 17181920222324 26272829 313233343536 3839 43 45 48
Vitis vulpina	1
Washingtonia filifera	13 16 18 2022 24 27 31 44
Washingtonia robusta	13 20 24 29 323334 48
Weigela coraeensis	9 1213 18 24 28
Weigela floribunda	18 24 38
Weigela florida	1 9 1213 18 20 24 26272829 31323334 36 3839 42 44 48
Weigela hortensis	1213 24
Weigela middendorffiana	9 1213
Weigela praecox	18 24 32
Weigela Xbristolruby	39

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 - 1960 - 1970
Weigela Xwagneri	9 1213 18 24
Westringia fruticosa	47
Westringia rosmariniformis	9 1213 18 24 28 48
Widdringtonia cupressoides	13 24 33
Widdringtonia dracomonta.	33
Widdringtonia juniperoide1	33
Wigandia caracasana	9 1213 18 20 24 28 32
Wigandia urens	9 13 18 24 28
Wisteria floribunda	18 24 28 31323334 36 39
Wisteria frutescens	3 13 18 24 28
Wisteria megasperma	13 18 20 24
Wisteria sinensis	1 345 13 18 2022 24 26272829 31323334 36 3839 44 47
Woodwardia orientalis	13 16 18 20
Woollsia pungens	16
Xanthoceras sorbifolium	18 24 3233
Xanthorrhoea australis	16 20
Xylomelum pyriforme	16 20
Yucca aloifolia	1 3 5 9 1213 18 20 24 28
Yucca filamentosa	1 3 6 9 1213 18 20 24 28 3233 42 44
Yucca gloriosa	1 3 6 9 1213 18 20 24 28 3233
Yucca recurvifolia	12
Ziziphus jujuba	4
Ziziphus paliurus	1 3

Appendix 3(a) List of catalogues and sources used to gauge Melbourne's history of woody ornamental planting

1. Macarthur, William	General Catalogues (N = 651)	1843,1847 1850,1857
2. Bunce, Daniel	The Australian manual of horticulture with synopsis of indigenous plants and hints for their culture. 3rd ed. Melbourne, Daniel Harrison. (N = 36)	1851 SL (VIC)
3. Rule, J.J.	Catalogue of plants cultivated for sale Victoria Nursery, Church St., Richmond (N = 471)	1857 SL (NSW)
5. Handasyde, McMillan & Co.	Catalogue of ornamental trees, shrubs, fruit trees, herbaceous plants and culinary plants and roots. 60 Elizabeth St. and adjoining Gardiner's Creek Road Station of the Melbourne railway. (N = 444)	1864 SL (VIC)
6. Law, Somner & Co	Seed and plant catalogue.(N = 598) Cremorne Nursery, Richmond.	1865 Herb (VIC)
7. Harris, Joseph	General catalogue of fruit trees, shrubs ornamental trees, plants etc- (N = 605) South Yarra Nurseries, Melbourne.	1873 SL (VIC)
8. Taylor, W.	Catalogue of plants, trees, shrubs, etc. Toorak, Melbourne. (N = 280)	1865 Herb (VIC)
9. Brunning, G.	Catalogue of hardy ornamental trees etc. St. Kilda, Melbourne. (N = 441)	1873 SL (NSW)
10. Cole, John C.	Descriptive catalogue of fruit trees, vines etc. Richmond Nursery, Melbourne. (N = 43)	1873
10. Cole, John C.	Supplementary catalogue of new fruits for 1874. Richmond Nursery, Melbourne. (N = 309)	1874
11. Perry	General catalogue of coniferae, hardy and ornamental shrubs, greenhouse plants, camellias, fruit trees, vines etc. Oranges & lemons. Fulham Grange Nurseries, Alphington. (N = 82)	1878 SL (VIC)
11a Purves	General catalogue. Wholesale & Retail Seedsman. 128 Swanston St., Melbourne.(n = 25)	1878 VSL
12. Adamson, William	Seed catalogue. (N = 82)) 71 Collins St., West Melbourne.	1880. Herb (VIC)
14. Law, Somner & Co.	Catalogue of plants and fruit trees. Melbourne (N = 57)	1886 Herb (VIC)
17. Adamson, William	Illustrated and descriptive seed catalogue. 47½ Collins St., Melbourne. (n = 127)	1891/92
18. Brunning, George & Sons	Descriptive catalogue of plants, trees, shrubs, and florists flowers, Melbourne. (N = 494)	1898 SL(Vic)
19. Cole, H.U.	Catalogue of fruit trees, vines etc. Tooronga Rd., Upper Hawthorn, Melbourne.	1895/96 Herb(VIC)
20. Cremorne Nurseries	Catalogue of plants. (N = 683) Richmond, Melbourne.	1901 SL (NSW)
21. Law, Somner & Co	Plant catalogue. (N = 517) 139+141 Swanston St., Melbourne.	1904 SL (NSW)
22. Cremorne Nurseries	Catalogue of plants. (N = 683) Richmond, Melbourne.	1905 Herb(VIC)

23.	Brunning, George & Sons	Catalogue of ornamental trees, shrubs, florists flowers, fruit trees etc. St. Kilda, Melbourne. (N = 474)	1906 Herb (VIC)
24.	Cheeseman	Descriptive catalogue of plants, seeds, bulbs etc. Brighton, Melbourne. (N = 549)	1910/11 SL (NSW)
25.	Brunning, George & Sons	Catalogue of ornamental trees, shrubs, florists flowers, fruit trees etc. (N= 595)	1913 SL (NSW)
26.	Brunning, George & Sons	Catalogue of ornamental trees, shrubs, fruit trees, florists flowers etc. 5 Brighton Rd., St. Kilda. (N = 645)	1916 Herb (VIC)
27.	Hodgins, R.W. & Son	Catalogue of trees, plants, shrubs and roses. Moreland Rd., Essendon. (N = 456)	1922 SL (NSW)
28.	Railton, James	Seed and plant catalogue. 273 Swanston St., Melbourne. (N = 445)	1923 SL (NSW)
29.	Gill & Searle Pty. Ltd.	General catalogue (N = 531) 73 Elizabeth St., Melbourne and Grendon Nursery, 550 Hampton St., North Brighton.	1928 SL (NSW)
30.	Cheeseman R. & Sons	Wholesale price list. (N = 213) Brighton Nurseries, Hawthorn Rd., Brighton.	1928/29 SL(NSW)
31.	Hodgins Nurseries Pty. Ltd.	Handbook of trees, shrubs and hardy plants Essendon. (N = 603)	1930/31 SL (VIC)
32.	Nobelius, C.A. & Sons	General catalogue. (N = 244) Gembrook Nurseries, Emerald.	1931 SL (NSW)
33.	Law, Somner Pty. Ltd.	General catalogue. (N = 721) 21-23 Elizabeth St., Melbourne.	1937 SL (NSW)
34.	Rimington, G.	Cultural hints and catalogue of plants. Parkhill Nurseries, Mount Victor Rd., Kew. (N = 353)	1939 SL (NSW)
35.	Hodgins Nurseries Pty. Ltd.	Handbook of trees, shrubs and hardy plants. Essendon. (N = 660)	1941 Duxsworth collection
36.	Nobelius, C.A. & Sons	General catalogue. (N = 558) Gembrook Nurseries, Emera	1941 SL (NSW)
37.	Hodgins Nurseries Pty. Ltd.	Trees, shrubs and hardy plants. (N = 421) Moreland Rd., Essendon.	1947 SL (NSW)
38.	Associated Nurseries P/L.	General catalogue. (N = 314) 366 St. Kilda Rd., Melbourne.	1947 Swinbourne collection
39.	Associated Nurseries P/L.	General catalogue. (N = 283) 366 St. Kilda Rd., Melbourne.	1950's Herb (VIC)
40.	Law, Somner Pty. Ltd.	Centenary catalogue 1850-1950. 21 Elizabeth St., Melbourne and Orrong Rd., Toorak. (N = 479)	1950 SL (VIC)
41.	Nobelius, C.A. & Sons S.L. & I. Linton (Proprietors)	General catalogue. (N = 265) Gembrook Nurseries, Emerald.	1956 SL (NSW)
42.	Sparks & McAlpine	General catalogue. (N = 345) Shannon St., Box Hill.	1957/58 Herb (VIC)
43.	Cheeseman R. & Sons	Wholesale price list. (N = 107) Hawthorn Rd., Brighton.	1962 SL (NSW)
44.	Forests Commission Victoria.	Tree price list. (N =144)	1967

45.	Din San Drive-In Garden Centre	Tree and shrub catalogue. (N = 1201)	Late 60's Early 70's
46.	Van Berthel Bros.	General catalogue. (N = 31) Silvan Rd., Monbulk.	1964
47.	Rimington's Nurseries	Stock list. (N = 100) South Oakleigh.	1973 Herb (ADL)
48.	Paramount Nurseries	Price list (N = 301)	1973 Herb (ADL)
49.	Charman Road Nurseries	General catalogue. (N = 234)	1975 Herb (VIC)
50.	Facey's Nursery	Stock list. (N = 246)	1979 Herb (VIC)

(N = 221) = Number of identifiable woody plants in catalogue

SL(NSW) = Catalogue housed in the State Library of New South Wales

SL (Vic) = Catalogue housed in the State Library of Victoria

ANU = Catalogue housed at the Australian National University

NLA = Catalogue housed in the National Library of Australia

Vic(herb) = Catalogue housed in the National Herbarium - Melbourne

SA (herb) = Catalogue housed in the South Australian Herbarium

APPENDIX 3b: STOCK LISTS OF THE MELBOURNE NURSERIES STUDIED: 1845 - 1980

Note: Numbers in table correspond to numbering of nurseries in Appendix 3(a)

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
+Laburnocytisus adamii	67 9 18 24 31 36 46
Abarema sapindoides	7 22
Abelia chinensis	1 3567 9 18 20 22 23242526 29 31 33343536 383940414243 46474849
Abelia floribunda	1 35 40 46
Abelia schumannii	33 36 3839 414243 4647
Abelia uniflora	67 9 18 242526272829 31 33 3536
Abelia Xgrandiflora	46 50
Abelmoschus manihot	1 3
Abies alba	56789 11 18 2021 242526 2829 313233 3536
Abies amabilis	12 17
Abies balsamea	1 67 9 17 2122 242526 28 33 36 46
Abies cephalonica	1 3 7
Abies concolor	17 21 36 42 46
Abies fraseri	9 11 18
Abies grandis	17
Abies jezoensis	46
Abies nordmanniana	67 9 18 2021 242526 31323334 36 42 46
Abies pindrow	3 9
Abies pinsapo	1 7 9 18 20 2425 36 46
Abies procera	1 7 9 17
Abies religiosa	1
Abies spectabilis	1 67 9 11 18 20 2425
Abrus precatorius	1
Abutilon bedfordianum	1 35 79
Abutilon darwinii tessela	6 18 20 22 2526 29
Abutilon golden fleece	18 20 22 25262728 37 46
Abutilon hybridum	20 2223 2526272829 31 33343536373839 4243 46
Abutilon megapotamicum	6 9 18 22 27 31 33343536 40 46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Abutilon pictum	356789 11 18 20 22 2526272829 31 3536373839 46
Abutilon sellovianum	22 24
Abutilon venosum	35678
Abutilon vesuvius	2526 29 37 46
Abutilon vitifolium	40
Abutilon XboutedeNiege	6 18 20 22 2526272829 31 35 46
Acacia accola	40 46
Acacia acinacea	20 22 2526 33 40 46 50
Acacia acuminata	33
Acacia adunca	33
Acacia aneura	33
Acacia armata	3 11A12 17 24 33
Acacia baileyana	18 2021222324252627282930 31 33343536373839404142434446 484950
Acacia boormanii	29 46
Acacia buxifolia	33 35 40 46 48
Acacia calamifolia	23 44 46
Acacia cardiophylla	33 40 46 48
Acacia conferta	33
Acacia cottinua	46
Acacia cultriformis	3 9 18 2021 232425262729 31 33 3536 46 4849
Acacia cyanophylla	12 25 47 33 40 46
Acacia dealbata	6 12 17 202122 24 26272829 31 333435 40 46 48
Acacia deanei	33 46
Acacia decora	33 35 40
Acacia decurrens	6 12 17 202122 24 26272829 31 3334353637383940 46 48
Acacia dentifera	29
Acacia drummondii	33 35 40 44 46 49
Acacia elongata	27 29
Acacia falcata	33
Acacia farnesiana	1 46
Acacia fimbriata	33 46
Acacia flexifolia	46
Acacia floribunda	1 12 26272829 31 33 35 40 44 46 484950

	1850 -	1870 -	1880 -	1890 -	1900 -	1910 -	1920 -	1930 -	1940 -	1950 -	1960 -	1970
Acacia glaucescens								33		40		48
Acacia gracilifolia											46	
Acacia hakeoides								33			46	
Acacia havilandii								33				
Acacia horrida					20 22							
Acacia howittii							2829	33		40	44 46	
Acacia implexa					22							
Acacia iteaphylla					22			33			46	50
Acacia jonesii									36			
Acacia juniperina					20 22			33				
Acacia kettlewelliae										40		
Acacia leprosa			12		22	27		33			46	
Acacia lineata											46	
Acacia linifolia	1							33		40	46	48
Acacia longifolia					2122	242526	272829 31	33	35	37383940	44 46	484950
Acacia longissima						2627						
Acacia lunata					2122							
Acacia macradenia					22							
Acacia maidenii					2122	26						
Acacia mearnsii			12			2526					46	48
Acacia melanoxylon				17	202122	24 26272829		31 33	353637	40	44 46	
Acacia myrtifolia					22	26272829		33	35	40	44 46	48
Acacia panniculata	1				22	26 29		3334				
Acacia pendula	1 3										44 46	48
Acacia penninervis							29	33				
Acacia podalyriifolia						242526	29 31	33343536		383940	44 46	4950
Acacia polybotrya										40		
Acacia pravissima										41	44 46	484950
Acacia prominens					212223	2526272829		31 3334353637		383940	44 46	4849
Acacia pruinosa						272829		31 333435			44 46	48
Acacia pulchella								33		40	46	48
Acacia pycnantha				17	212223	242526272829		31 3334353637		383940	44 46	48
Acacia retinodes					22		29	33			44 46	48

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Acacia riceana	46
Acacia rubida	1 33 48
Acacia rupicola	33
Acacia salicina	22
Acacia saligna	17 22 242526272829 31 3334353637383940 44 46 48
Acacia spectabilis	27 29 31 333435 40 46 48 50
Acacia steedmanii	33 40
Acacia stricta	2526 33
Acacia suaveolens	1 3 26 33 40 46 48
Acacia suberosa	46
Acacia sublanata	46
Acacia terminalis	33 44 46
Acacia undulifolia	46
Acacia vestita	3 9 46 48
Acer barbatum	31
Acer buergeranum	46
Acer campestre	5678 21 33 44 46
Acer cappadocicum	36 46
Acer davidii	41 46
Acer ginnala	33 46
Acer grosseri	46
Acer hookeri	46
Acer japonicum	18 2728 333436 4142 46
Acer monspessulanum	7
Acer negundo	1 3 6 2223 27 29303132 343536373839 4142 44 4647 49
Acer opalus	32 36
Acer palmatum	18 20 2223242526 303132333435363738394041424344 4647
Acer platanoides	1 5 3334 36 42 46
Acer pseudoplatanus	12 5678 18 252627 313233 353637 44 4647
Acer rubrum	28 31 42 46
Acer rufinerve	46
Acer saccharinum	1 78 313233343536 46
Acer saccharum	32 353637 46

	1850 -	1870 -	1880 -	1890 -	1900 -	1910 -	1920 -	1930 -	1940 -	1950 -	1960 -	1970
Acer tararicum								32				
Acer tegmentosum												46
Acmena smithii	1	3 5 6 8 9	11		18	20 21	22 23 24 25 26 27	29 30 31 32 33 34 35 36 37 38 39 40		42		46 48
Acokanthera oblongifolia		6			18	20	22 23 24 25 26	31	34 35 36	38		46
Acradenia frankliniae												46
Actinidia chinensis									36			46 48
Actinostrobus pyramidalis		9										46
Adansonia digitata	1											
Adenandra fragrans												46
Adenandra uniflora	1				18	20	23 24 25 26 27		36		42 43	46 48
Adenanthera pavonia	1											
Adenanthos obovatus												50
Adenanthos sericea												46
Aeschynanthus boschianus	1											
Aeschynanthus longiflorus	1											
Aeschynanthus marmorata	1											
Aeschynanthus parasiticus	1											
Aeschynanthus pulcher	1	3										
Aesculus californica					22							
Aesculus hippocastanum	1	2 3 6 9 10 11			18	20 21 22	24 25 26 27 28 29	31 32 33 33 34 35 36 37 38 39			44	46
Aesculus Xcarnea	1							32	34 35 36	38	42	46
Agapetes serpens								33	35 37	40		46
Agathis australis	1	3 7							36			46
Agathis moorei		7 9										
Agathis robusta		6 7 8 9	11		18		29		35			
Agathosma capensis								31	35	38 39		48
Agathosma pulchella								31	34 35 36 37 38 39		41 42 43	46
Agave americana	1	3 5 6 7 8 9	11		18	20	22 23 24 25 26 27					49
Agonis flexuosa		6			18	20	22 23 24 25 26 27 28 29 30 31	33 34 35 36 37 38 39 40 41 42 43 44				46 48 49 50
Agonis juniperina											44	46 48
Agonis marginata												46
Agonis parviceps												46
Agonis spathulata												46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Ailanthus altissima	1 356789 11 18 2021222324252627 29 3334
Akebia quinata	7 202122 24 27 29 31 333435 37 4142 46
Akebia trifoliata	27 31 35 37 40
Alberta magna	37 46
Albizia distachya	1 20 24 26 3334 46 48
Albizia julibrissin	46
Alectryon excelsus	5 7 18 20 2223242526 36
Allamanda cathartica	1 3 24
Allamanda neriifolia	1 5 78 11 24
Allamanda violacea	5
Alnus glutinosa	6 11 32 36 42 46
Alnus incana	42 46
Alnus jorullensis	44 46 49
Alocasia macrorhiza	20
Aloe arborescens	356
Aloe saponaria	56
Aloysia triphylla	1 356789 11 18 202122232425262728293031 33343536373839 4142 46
Alpinia zerumbet	24
Alsophila australis	6 20 22
Alsophila cunninghamii	6 22
Alsophila excelsa	22
Alsophila smithii	6
Alsophila tricolor	22
Alstonia scholaris	1 3
Alyogyne huegelii	5 8 46
Alyxia buxifolia	46
Amelanchier canadensis	1 343536 46
Amelanchier laevis	46
Amelanchier sanguinea	35 37
Amicia zygomeris	1
Amorpha canescens	32
Amorpha fruticosa	1 567
Ampelopsis brevipedunculata.	20 22 27 35 37 42 46

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Anemopaegma chamberlaynii	3 7	11										
Angophora cordifolia	1										46	
Angophora costata						2728	3031	33 35	37	40	44 46	4950
Angophora floribunda					20						46	
Angophora subvelutina								33		40		
Annona cherimola	1 3 7											
Annona glabra	1											
Anopterus glandulosus	56 9	11			20 22						46	
Anredera cordifolia						23242526						
Anthyllis barba-jovis	1				20 22							
Antigonon leptopus											46	
Aotus gracillima												
Aphanopetalum resinosum	567 9			18		23 2526		29				
Aphelandra squarrosa												49
Aphelandra tetragona	1											
Aralia spinosa	6											
Araucaria angustifolia	1 3 6											
Araucaria araucana	1 3 67 9	11		18	2021	24 26	28	313233			46	
Araucaria bidwillii	1 356 89	11		18	2021	242526		33	3536		46	
Araucaria columnaris	1 35 789			18					35			
Araucaria cunninghamii	1 356789	11		18	2021	2324			35		46	
Araucaria heterophylla	1 356789	11		18	2021	242526	2829	3132333435	37383940	42	46	
Araujia sericifera						23242526	2829	31			46	
Arbutus andrachne	1 3 9					23 2526		31			46	
Arbutus canariensis	67 9				20212223242526							
Arbutus menziesii			12	17	21			33				
Arbutus unedo	1 356789	11		1718	2021222324252627	2829	313233343536	37383940	4142434446			49
Archontophoenix alexandr.	67 9	11				23 2526						
Archontophoenix cunningh.	1				20212223	2526	28					
Ardisia crenata	1 356789	11		14 18	20 22				35 37	42		
Ardisia crispa	5 7											
Arecastrum romanzoffianum	6				2021222324							
Aristolochia durior	6								37		46	

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Aristolochia fimbriata		7										
Aristolochia sempervirens	1 3	7										
Aristolochia trilobata		7		18								
Aristotelia racemosa									36			46
Aronia arbutifolia												46
Aronia prunifolia									36			
Artabotrys hexapetalus	1											
Artemisia abrotanum	1					24						46
Arundinaria hookeriana									35			
Arundinaria simonsii								31	35			
Arundinaria variegata		67 9		18		22232425262728		31				
Arundo donax		56789	11			21222324252627	29					
Asarina barclaiana	1	3567 9	1111a12	18		20212223 25262728		33				
Asarina erubescens	1	35678	11 12	18		202122232425262728						
Asclepias fruticosa	1	7					3031	33				
Asimina triloba	1											
Asparagus asparagoides	1	7		14 18		2122232425262728		33				46
Asparagus densiflorus						202122232425262728293O		33				46 49
Asparagus officinalis	23	7 10	11A12141718			21 2324 26272829	31		35	40		
Asparagus scandens						24						
Asparagus setaceus				14 18		202122232425262728293O		33				46
Asparagus virgatus				14 18		202122 24						
Astartea fascicularis		6										46
Asterolasia asteriscophora												46
Asterolasia mollis												46
Astroloma ciliatum										40		
Astroloma conostephioides												46
Astroloma macrocalyx								33				
Astroloma pinifolium												46
Astroloma prostratum										40		
Asystasia scandens	1											
Atherosperma moschatum	1											46
Athrotaxis cupressoides		5										

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Athrotaxis selaginoides	5 46
Atriplex nummularia	46
Aucuba japonica	1 356789 11 18 20 22232425262728293031323334353637383940414243 46 4849
Austrocedrus chilensis	678
Azara integrifolia	46
Azara lanceolata	46
Azara microphylla	6 20 2223 252627 2930 35 37 46
Backhousia myrtifolia	5 7 18 23 2526 29 36 42 46
Baeckea astarteoides	46 50
Baeckea linifolia	202122 24 2627 33 46 50
Baeckea ramosissima	46
Baeckea virgata	353637 50
Baloghia lucida	1 20 22 27
Bambusa arundinacea	1 35 9 11 37
Bambusa glaucescens	35 37
Banksia baueri	46 4849
Banksia baxteri	33 46 4849
Banksia caleyi	48 50
Banksia coccinea	5 33 46
Banksia collina	33 35 37 40 42 46 4950
Banksia ericifolia	6 20 22 33 40 46 484950
Banksia grandis	5 8 29 40 46 50
Banksia integrifolia	46 4950
Banksia lehmanniana	33
Banksia littoralis	40
Banksia marcescens	48
Banksia marginata	40 46 4950
Banksia media	484950
Banksia menziesii	33 46
Banksia occidentalis	33 40 46 50
Banksia prionotes	40 46
Banksia robur	50
Banksia serrata	46 50

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Banksia speciosa	33 40 46 48 50
Banksia spinulosa	5 42 48 50
Banksia verticillata	29
Banksia victoria	33
Barklya syringifolia	5 9
Barleria cristata	567 11 18 20 2223 252627 29
Barleria strigosa	1
Bauera rubioides	1 6 27 37 40 46 48 50
Bauera sessiliflora	27 35 37383940 46 4950
Bauera Xrubiodes-sessifl.	
Bauhinia racemosa	1 3
Bauhinia scandens	1 3 46
Bauhinia tomentosa	1
Bauhinia variegata	3 18 22
Beaucarnea gracilis	18
Beaucarnea recurvata	1
Beaufortia decussata	33 40
Beaufortia orbifolia	46
Beaufortia purpurea	46
Beaufortia sparsa	7 35 37 40 46 4849
Beaufortia squarrosa	40 46
Beaumontia grandifolia	1 3 8
Begonia albo-picta	20
Begonia coccinea	35 7
Begonia corallina	28
Begonia dipetala	1
Begonia foliosa	1 35 7 11 20 22
Begonia grandis	3 7
Begonia maculata	1 3 8 11 20 22
Begonia metallica	20 22
Begonia odorata	1
Begonia reniformis	1
Begonia sanguinea	1 35 7

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Begonia stipulacea	1 11
Begonia undulatum	11 20 22
Begonia Xcredneri	20 22
Begonia Xsemperflorens-cul	3
Begonia Xweltoniensis	20 22
Berberidopsis corallina	33 46
Berberis aggregata	29 3132 36
Berberis brachypoda	31
Berberis buxifolia	5 7
Berberis darwinii	1 356789 11 18 20 22 2425262728293031323334353637383940414246
Berberis dictyophylla	42
Berberis dielsiana	35
Berberis dulcis	1
Berberis floribunda	24
Berberis gilgiana	31
Berberis hookeri	1 3
Berberis pruinosa	46
Berberis sargentiana	31 33 353637 4142 46
Berberis taylorii	36
Berberis thunbergii	20 2930313233343536373839404142 46
Berberis vernae	31
Berberis virescens	36
Berberis vulgaris	1 356789 11 14 18 20212223242526 2829303132333435363740 42 44 46 48
Berberis wilsoniae	2829303132333435363740 46
Berberis Xstenophylla	6 18 20 22 3031 46
Betula alleghaniensis	46
Betula ermanii	46
Betula maximowicziana	46
Betula nana	46
Betula papyrifera	36 46
Betula pendula	6 20212223 2526 2829 313233343536373839404142434445464749
Betula pubescens	33
Betula schmidti	46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Billardiera cymosa	5 7 40
Billardiera longifolia	22 33 40 46
Billardiera scandens	6 40
Bixa orellana	1
Boronia anemonifolia	1 46 50
Boronia cymosa	33
Boronia denticulata	383940 46 48 50
Boronia elatior	6 18 202122232425262728 29 36 4041 46 48
Boronia filifolia	46 50
Boronia floribunda	40
Boronia fraseri	46
Boronia heterophylla	6 32 40 46 484950
Boronia ledifolia	1 6 46
Boronia megastigma	56789 11 12 1718 202122232425262728 29 313233343536373839404143 46 484950
Boronia microphylla	1
Boronia mollis	46
Boronia muelleri	40 46
Boronia pinnata	1 6 18 20212223242526 36 40 46
Boronia purdieana	33 46
Boronia serrulata	1 3 11 17 33 40 46
Boronia spathulata	46
Bosea amherstiana	67 9 11 18 20 2223242526272829 3334
Bougainvillea glabra	6 9 18 202122232425262728293031 3334353637 4041 43 46 48 50
Bougainvillea refulgens	202122232425262728
Bougainvillea spectabilis	1 356789 11 18 20212223242526 28293031 35
Bougainvillea Xbuttiana	33 353637 46
Bouvardia ternifolia	1
Bouvardia Xdavonsii	18
Bouvardia Xpresident gar.	37
Bowkeria triphylla	20 22
Brachychiton acerifolius	1 356789 11 1718 20212223242526 28293031 3334353637383940 4243 46 49
Brachychiton discolor	18 20 222324 2728 40 46
Brachychiton diversifolium	567 9 11 18 29 32 40

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Brachychiton gregorii	33
Brachychiton populneus	1 7 20 22232425262728293031 33343536373839 40 42 46
Brachychiton rupestris	1 46
Brachychiton Xhybridus	35
Brachycome multifida	50
Brachyglottis purpurea	33 36 38 46
Brachysema lanceolatum	293031 333435 3738 40 43 46 484950
Brachysema latifolium	46 49
Brassaia actinophylla	46 49
Breynia disticha	6
Broussonetia papyrifera	567
Browallia speciosa	2425 33
Brugmansia arborea	1 35 7 9 20212223242526272829 30 333435 46
Brugmansia sanguinea	1 202122 242526 2829 33 35 46
Brugmansia suaveolens	1 28
Brunfelsia acuminata	1 3 8
Brunfelsia hydrangeiformi	1 3 8
Brunfelsia latifolia	1 3 6 8 35 46
Brunfelsia pauciflora	1 3 6 8
Brunfelsia uniflora	1 3 8 24
Buckinghamia celsissima	26
Buddleia alternifolia	33 35 37 46
Buddleia colvilei	3334353637 42
Buddleia crispa	1 3 67 9 11 18 20212223242526272829 30 33 46
Buddleia davidii	252627282930313233343536373839404142 46
Buddleia globosa	1 3567 9 11 18 20212223242526272829 3031 333435 37 40 46
Buddleia lindleyana	1 35 7 11 20 22 27
Buddleia madagascariensis	1 5 7
Buddleia pulchella	22
Buddleia salvifolia	1 35 7 31 333435 37383940 42 46
Burchellia bubalina	1 35 7
Bursaria spinosa	7
Butia capitata	202122

	1850	- 1870	- 1880	- 1890	- 1900	- 1910	- 1920	- 1930	- 1940	- 1950	-1960	- 1970
Buxus balearica	5			18		2526			36			
Buxus microphylla	7											
Buxus sempervirens	1	356 89	11	18	20	21222324	25262728	29 31	33	34353637	38394041	42 44 46 4849
Bystropogon origanifolius												46
Caesalpinia gilliesii		67 9		18	20	2122 24	2526 28	29 30 31	33	34	40	42 46
Caesalpinia pulcherrima	3	7				24						
Caesalpinia tara					20	2223						
Calceolaria bicolor	1											
Calceolaria integrifolia					21	24	27	29 31	33	37		46
Calliandra portoricensis									33	35 37		46
Calliandra tweedii		7								35		46
Callicarpa bodinieri								32		35 36	42	46
Callicarpa dichotoma									33	35		
Callicarpa japonica												46
Callicarpa rubella												46
Callicoma serratifolia												46
Callistemon acuminatus										40		
Callistemon brachyandrus					20	2223		29		37		46
Callistemon citrinus						22		27 28 29	32	33 34 35 36	38 39 40	44 46 484950
Callistemon comboynensis												50
Callistemon lilacinus												46 50
Callistemon linearis		7		18	20	2223	2526		33			46 48
Callistemon macropunctatus		567		18	20	21222324	25262728	29 31	33	34 35 37	40	
Callistemon pallidus											40	46
Callistemon paludosus							27	31	33	35		
Callistemon phoeniceus					20	22	27		33			46 48
Callistemon rimifolius											40	46 50
Callistemon rigidus		356789	11	1718	20	21222324	25262	29	33			46
Callistemon salignus	1	3			20	22	25262728	29 31				46 48 50
Callistemon speciosus	1									35		46 48 50
Callistemon viminalis												46 484950
Callistemon violaceus												50
Callistemon Xharkness												50

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Callitris columellaris	7 46
Callitris endlicheri	1 5 33 40
Callitris gunnii	1 35 789 11 20 2324 2829
Callitris macleayana	7 9
Callitris muelleri	33 40
Callitris oblonga	2526
Callitris preissii	9 18 29 31 33 36 46
Callitris rhomboidea	1 356789 11 18 20 242526 2829 31 333435 3839 44 46
Calluna vulgaris	6 9 202122 2526 2829 31 33 3536 3839 46 48 50
Calocedrus decurrens	56 12 17 2021 24 33 35 46
Calocephalus brownii	46 48
Calodendrum capense	18 20 22232425262728293031323334353637383940 4243 46
Calonyction aculeatum	20 40
Calothamnus homalophyllus	46
Calothamnus quadrifidus	5 7 37 46 48
Calothamnus rupestris	46
Calothamnus sanguineus	46 4849
Calothamnus torulosus	46
Calothamnus validus	35 37 46
Calothamnus villosus	46 48
Calycanthus floridus	1 3 67 9 11 18 20 222324252627 29 313233 35 3738 46
Calycanthus occidentalis	6 18 20 22 33 40
Calycotome spinosa	1 5
Calystegia hederacea	3 7
Calystegia sepium	7
Calytrix alpestris	46
Calytrix angulata	46
Calytrix glutinosa	40 46
Calytrix sullivanii	23 2526 3031 33 35 40 46
Calytrix tetragona	23 2526 29 31 40 42 46
Camellia japonica	1 3567 9 11 18 20 2223 252627 29 31 33 353637383940414243 4849
Camellia maliflora	1
Camellia oleifera	1

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                    1850 - 1870 - 1880 - 1890 - 1900  - 1910 - 1920 - 1930 - 1940 - 1950  -1960  - 1970

Camellia reticulata      1
Camellia sasanqua        1          11                  22          282930313233  3536373839  414243         4849
Camellia sinensis        1 3567 9   11          18  202122  24                                  41
Campsidium filicifolium                          202122232425262728  30    33
Campsidium valdivianum                           20212223  2526272829  31  333435  37         42
Campsis grandiflora      1 356789   11          18  2021222324252627282930313233343537    40          46
Campsis radicans         1 356789   11          18  202122232425262728293031  3334                    46
Campsis Xguilfoylei                              18  20212223242526272829303132333435
Canavalia  bonariensis      567 9                18  20  222324
Cantua bicolor                                                                                        46
Cantua buxifolia           3 67 9   11          18  2021222324252627282930313  333435  37383940          46
Cantua pyrifolia         1 3 67 9                   20212223242526    29
Capparis mitchellii      1  5 7
Capparis spinosa         1  5                17      21
Cardiospermum halicacabum                          21
Carica papaya              5
Carissa bispinosa           6789                18
Carmichaelia arborea     1
Carpentaria californica                      18        23  2526    29  31            38
Carpinus betulus                                                  3233              41          46
Carpinus caroliniana                                                        36
Carya illinoinensis                                                                   42        46
Carya laciniosa                                  20  2223
Carya tomentosa          1                                                33    36          41
Caryopteris clandonensis                                                                              46
Caryopteris incana                               20  2223  25262728293031  3334353637383940          46
Caryota mitis                                      23
Caryota urens              56
Cassia artemisioides                                                                  40          46
Cassia australis                                   22                                             46
Cassia bicapsularis                                          2728    31  333435363738394041 42    46    49
Cassia corymbosa                                 20  2223242526    29                             46
Cassia didymobotrya                                                                               46
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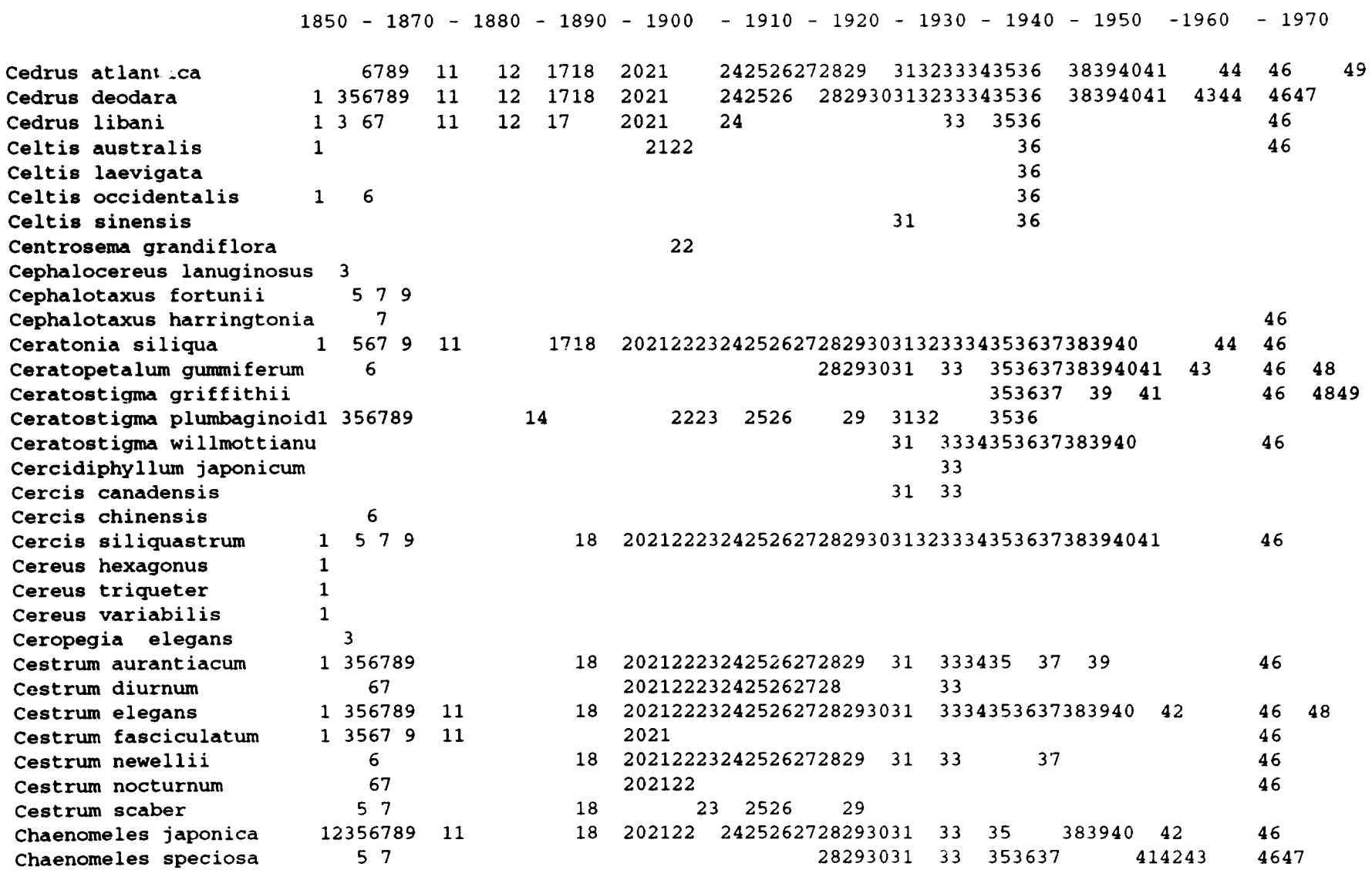
	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Cassia eremophila	46
Cassia floribunda	18 202122 24 2728
Cassia laevigata	23242526 2930
Cassia planiticola	2526 2930
Cassia tomentosa	27 353637 46
Castanea sativa	12356 891011 14 18 20212223242526272829 3132 3536 4142 4647 49
Castanospermum australe	1 3567 9 12 18 20 222324252627 34 46 48
Casuarina cunninghamiana	29 33 40 44 46 48 50
Casuarina equisetifolia	2
Casuarina glauca	33 40 44 46 50
Casuarina littoralis	33 46 50
Casuarina nana	33 40
Casuarina stricta	12 17 20212223 2526272829 31 33 35 40 44 46 48 50
Casuarina torulosa	21 33 40 46 484950
Catalpa bignonioides	1 3 67 9 18 20212223242526 2829 3132 343536373839 41 44 46
Catalpa ovata	5 35 37
Catalpa speciosa	6 3233
Catalpa Xhybrida	32
Cavendishia acuminata	1 3 20 22 3435 37 46
Ceanothus americanus	5 7
Ceanothus coeruleus	678 32 36
Ceanothus dentatus	36 39 48
Ceanothus impressus	46
Ceanothus leucodermis	1 67 9 11 18 20212223242526 2829 313233 3637 40
Ceanothus papillosus	9
Ceanothus rigidus	38 40 46
Ceanothus thyrsiflorus	5 9 46
Ceanothus veitchianus	6 18 23242526 2829 31323334353637 46
Ceanothus Xburkwoodii	33 36
Ceanothus Xdelilianus	18 20 2223242526 29 33 3536 41
Ceanothus Xedwardsii	31 333435363738394041 48
Cedrela sinensis	343536373839 41 4647 50
Cedronella canariensis	3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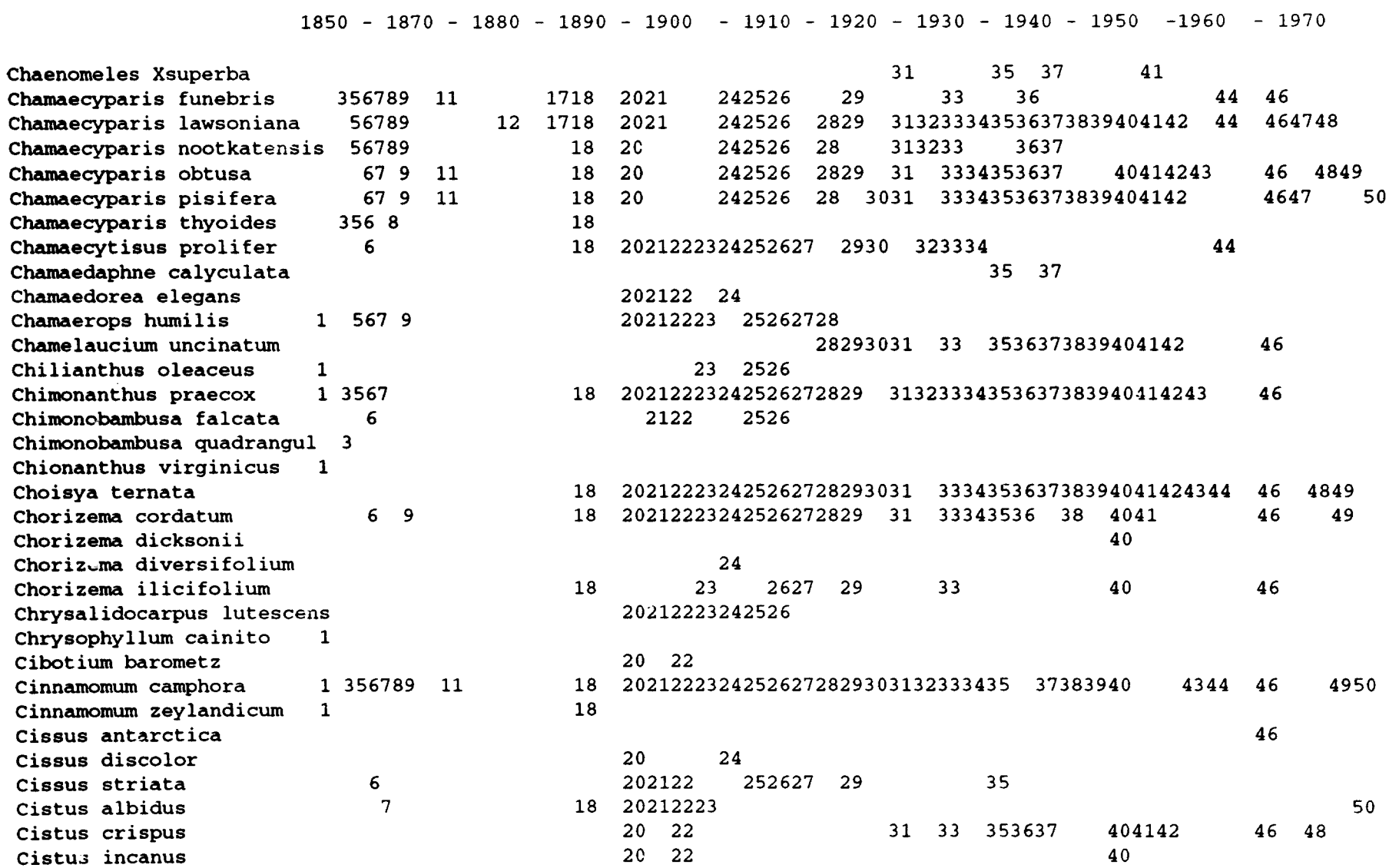
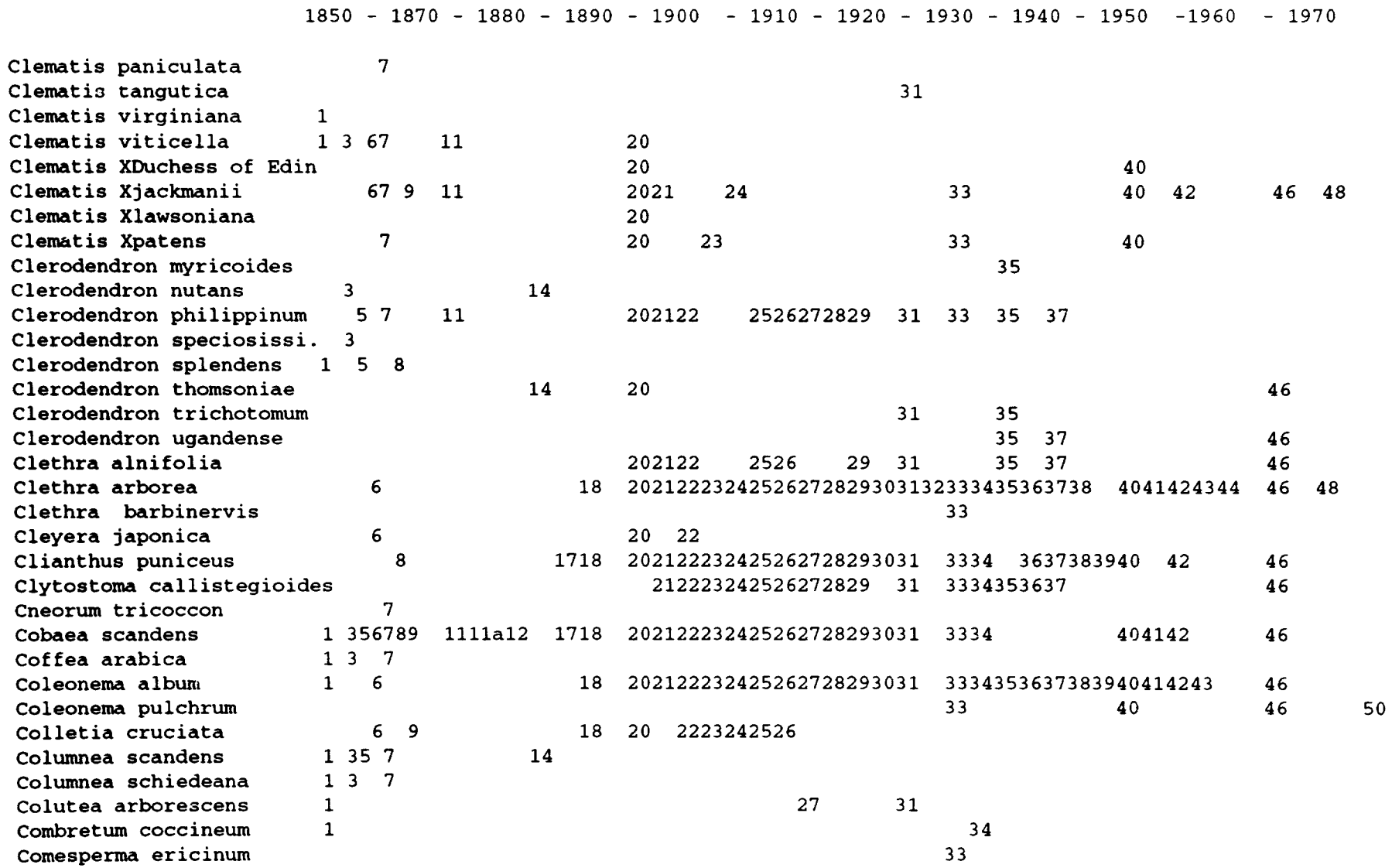
Cedrus deodara 1 356789 11 12 1718 2021 242526 28293031323334353637383940 41 4344 4647
Cedrus libani 1 3 67 11 12 17 2021 24 33 3536 46
Celtis australis 1 2122 36 46
Celtis laevigata 36
Celtis occidentalis 1 6 36
Celtis sinensis 31 36
Centrosema grandiflora 22
Cephalocereus lanuginosus 3
Cephalotaxus fortunii 5 7 9
Cephalotaxus harringtonia 7 46
Ceratonia siliqua 1 567 9 11 1718 20212223242526272829303132333435363738394041 44 46
Ceratopetalum gummiferum 6 28293031 33 353637383940 41 43 46 48
Ceratostigma griffithii 353637 39 41 46 4849
Ceratostigma plumbaginoid 1 356789 14 2223 2526 29 3132 3536
Ceratostigma willmottianu 31 3334353637383940 46
Cercidiphyllum japonicum 33
Cercis canadensis 31 33
Cercis chinensis 6
Cercis siliquastrum 1 5 7 9 18 202122232425262728293031323334353637383940 41 46
Cereus hexagonus 1
Cereus triqueter 1
Cereus variabilis 1
Ceropegia elegans 3
Cestrum aurantiacum 1 356789 18 20212223242526272829 31 333435 37 39 46
Cestrum diurnum 67 202122232425262728 33
Cestrum elegans 1 356789 11 18 2021222324252627282930 31 3334353637383940 42 46 48
Cestrum fasciculatum 1 3567 9 11 2021 46
Cestrum newellii 6 18 20212223242526272829 31 33 37 46
Cestrum nocturnum 67 202122 46
Cestrum scaber 5 7 18 23 2526 29
Chaenomeles japonica 12356789 11 18 202122 2425262728293031 33 35 383940 42 46
Chaenomeles speciosa 5 7 28293031 33 353637 414243 4647


1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Chaenomeles Xsuperba
Chamaecyparis funebris
Chamaecyparis lawsoniana
Chamaecyparis nootkatensis
Chamaecyparis obtusa
Chamaecyparis pisifera
Chamaecyparis thyoides
Chamaecytisus prolifer
Chamaedaphne calyculata
Chamaedorea elegans
Chamaerops humilis
Chamelaucium uncinatum
Chilianthus oleaceus
Chimonanthus praecox
Chimonobambusa falcata
Chimonobambusa quadrangul
Chionanthus virginicus
Choisya ternata
Chorizema cordatum
Chorizema dicksonii
Chorizema diversifolium
Chorizema ilicifolium
Chrysalidocarpus lutescens
Chrysophyllum cainito
Cibotium barometz
Cinnamomum camphora
Cinnamomum zeylandicum
Cissus antarctica
Cissus discolor
Cissus striata
Cistus albidus
Cistus crispus
Cistus incanus

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Cistus ladanifer	20 22232425262728 33 37 484950
Cistus laurifolius	20 2223 2526 29 33 46
Cistus lusitanicus	24 41
Cistus monspeliensis	1 23 2526 29 33
Cistus psilosepalus	1 5 20 22
Cistus salviifolius	46
Cistus Xcanescens	9 23 2526 29
Cistus Xcyprius	32 36 4142 46
Cistus Xpurpureus	353637 40 4243 46 484950
Cistus Xsilver pink	36 4041 46
Cistus Xstenophylla	46
Cistus Xwintoniensis	35
Citharexylum fruticosum	7 18 23 2526
Citharexylum quadrangular	46
Citrus aurantiifolia	1235 78 1011 14 22 3132 36
Citrus aurantium	1 10 14 18 2223 26 31
Citrus limon	1 35 7891011 14 18 21222324 2627 2930313233 3536 383940414243 49
Citrus maxima	1 5 7891011 14 2223 26 32 36
Citrus medica	1 5 89 2223 26
Citrus reticulata	1 3 7891011 14 2223 26 29 3132 3536 4142 49
Citrus sinensis	1235 7891011 14 18 21222324 2627 29303132 3536 3839 4142 49
Citrus Xparadisi	29 3132 3536 3839 4142 49
Cladrastis lutea	56
Clausena lansium	1
Clematis aristata	40 46
Clematis armandii	33 35 37
Clematis campaniflora	1
Clematis flammula	1 67 9 12 17 21 24 29 33
Clematis florida	1 20 33
Clematis heracleifolia	1 35
Clematis lanuginosa	20 33
Clematis montana	1 3 67 20 24 2728293031 333435 37 40 46 49
Clematis orientalis	27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Clematis paniculata 7
Clematis tangutica 31
Clematis virginiana 1
Clematis viticella 1 3 67 11 20
Clematis XDuchess of Edin 20 40
Clematis Xjackmanii 67 9 11 2021 24 33 40 42 46 48
Clematis Xlawsoniana 20
Clematis Xpatens 7 20 23 33 40
Clerodendron myricoides 35
Clerodendron nutans 3 14
Clerodendron philippinum 5 7 11 202122 2526272829 31 33 35 37
Clerodendron speciosissi. 3
Clerodendron splendens 1 5 8
Clerodendron thomsoniae 14 20 46
Clerodendron trichotomum 31 35
Clerodendron ugandense 35 37 46
Clethra alnifolia 202122 2526 29 31 35 37 46
Clethra arborea 6 18 20212223242526272829303132333435363738 4041424344 46 48
Clethra barbinervis 33
Cleyera japonica 6 20 22
Clianthus puniceus 8 1718 202122232425262728293031 3334 3637383940 42 46
Clytostoma callistegioides 212223242526272829 31 3334353637 46
Cneorum tricoccon 7
Cobaea scandens 1 356789 1111a12 1718 202122232425262728293031 3334 404142 46
Coffea arabica 1 3 7
Coleonema album 1 6 18 20212223242526272829303133343536373839404142 43 46
Coleonema pulchrum 33 40 46 50
Colletia cruciata 6 9 18 20 2223242526
Columnea scandens 1 35 7 14
Columnea schiedeana 1 3 7
Colutea arborescens 1 27 31
Combretum coccineum 1 34
Comesperma ericinum 33

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Comesperma volubile	7											
Convolvulus cneorum							31	35	37		46	50
Convolvulus mauritanicus	7			1718	21	22324252627	29	31	33	3637	42	46
Coprosma hirtella					20	2223						
Coprosma lucida	67	9	11	18	20	212223242526272829	30	34				
Coprosma quadrifida	9											
Coprosma repens	6	9		18	20	2223242526272829	31	33	34353637383940		42	46
Coprosma robusta						25						
Coprosma Xkirkii												48 50
Cordyline australis	1	3567	89	18	20	212223242526272	8	33				47484950
Cordyline indivisa	5	7	9 11			25						48
Cordyline stricta	5	7	11			24						
Cordyline terminalis	5	78			202122	2526	28					
Coriaria myrtifolia	7											
Cornus alba							30	32	33343536			
Cornus capitata	567			18	20	212223242526272829	31	33	343536373839	4041424344	46	48
Cornus florida								3233	35363738	42	46	
Cornus kousa							31				46	
Cornus mas									36		46	
Cornus nuttallii											46	
Cornus sanguinea							31		35			
Cornus sericea							31		353637	4142	46	
Corokia cotoneaster	6								3536	42	46	49
Corokia macrocarpa											46	
Coronilla emerus						24 26	31					
Coronilla juncea	1	3		18								
Coronilla montana					22							
Coronilla valentina	1	6789	11	18	20	222324252627						
Correa aemula										40		
Correa alba	3									40	46	
Correa baeuerlenii										40	46	49
Correa decumbens									35	40	46	
Correa lawrenciana	6				20	22					46	

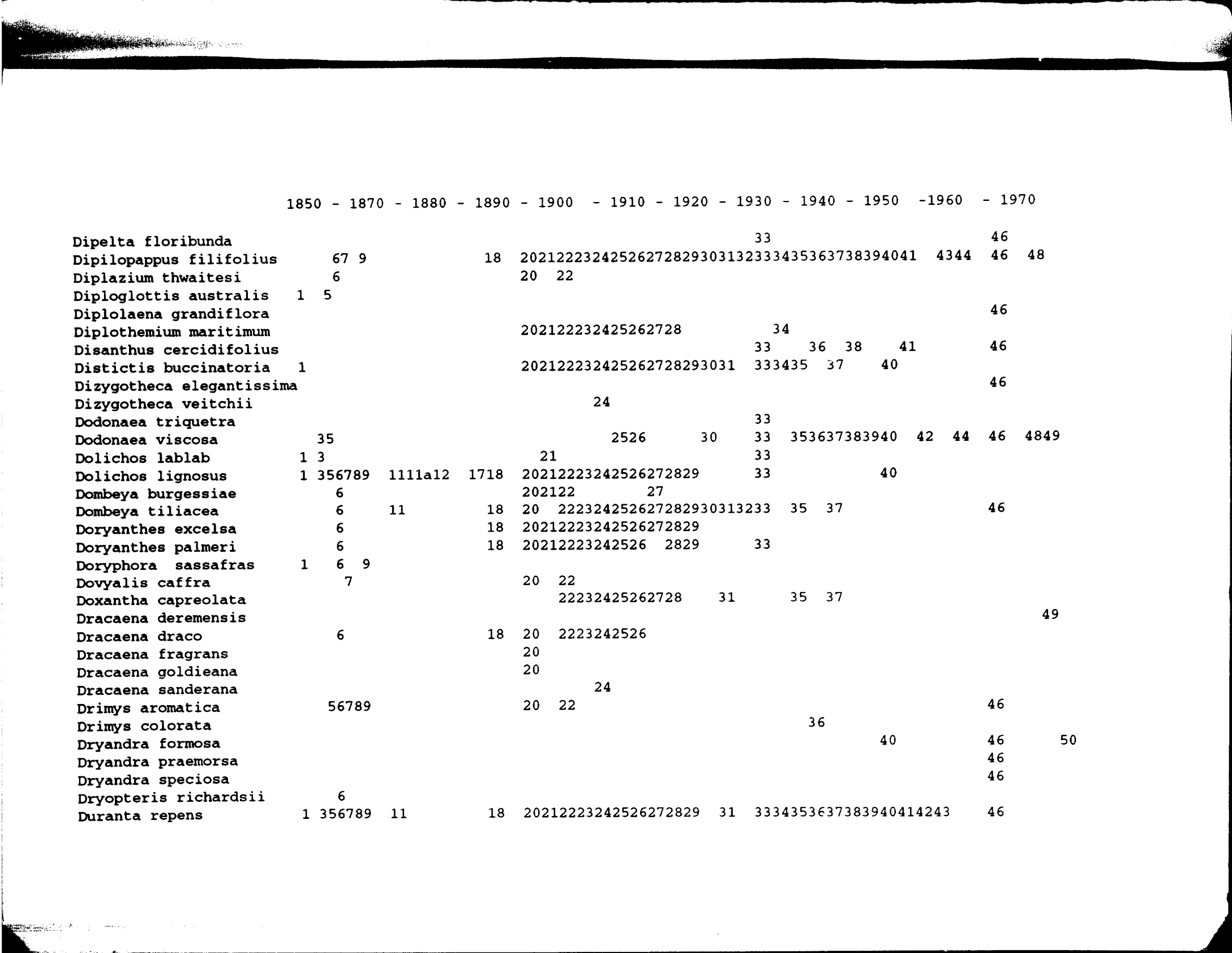
	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Correa pulchella	46
Correa reflexa	3 6 46
Correa schlechtendalii	46
Correa Xduskybells	50
Correa Xmanii	46 50
Cortaderia selloana	567 9 11 18 2122232425262728 484950
Corylopsis spicata	46
Corylus avellana	12356 91011 14 18 222324 26 29 31 34 373839 4142 46 49
Corynocarpus laevigata	1 356789 11 18 20212223242526272829 30 33 353637 46
Corypha umbraculifera	6
Cotinus coggygria	1 78 202122 2728 31 3334 3637383940414243 4647
Cotoneaster adpressus	31 46 48
Cotoneaster affinis	6
Cotoneaster bullatus	36 38 404142 46
Cotoneaster buxifolius	7 18 28
Cotoneaster congestus	31 3536 38
Cotoneaster dammeri	35 46 48 50
Cotoneaster dielsianus	36
Cotoneaster franchetii	31 3334353637 404142 46
Cotoneaster frigidus	31 36
Cotoneaster glaucophyllus	31 343536373839404142 46
Cotoneaster harrovianus	46
Cotoneaster horizontalis	31 33343536373839404142 43 464748 50
Cotoneaster hupehensis	31
Cotoneaster lacteus	46
Cotoneaster microphyllus	567 9 20 2223 25262728293031 333435363738 40414243 4647484950
Cotoneaster pannosus	29 31 33343536 3839404142 46 49
Cotoneaster rotundifolius	3 7 18 24 3334 40 46
Cotoneaster rugosus	31 36
Cotoneaster salicifolius	42 46
Cotoneaster simonsii	18 20 22232425262728293031 33343536373839404142
Cotoneaster Xcornubius	46
Cotoneaster Xwatereri	36 42 46 48

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Cotyledon orbiculata	1 3 6
Crassula albifolia	1
Crassula ciliata	1
Crassula falcata	3
Crassula tetragona	567 20 22
Crataegus arkansana	31
Crataegus arnoldiana	31 35 42
Crataegus azarolus	1 6 36
Crataegus canbyi	31
Crataegus chlorosarca	32
Crataegus coccinoides	36
Crataegus crus-galli	78 34 36 42
Crataegus douglasii	56 32 36 46
Crataegus dubrobrivensis	31 35
Crataegus laevigata	1 356789 18 2021222324252627282930313233343536373839404142 46
Crataegus mexicana	2829 3132 343536373839404142 46
Crataegus monogyna	11a12 21
Crataegus pedicellata	31 35 46
Crataegus phaenopyrum	212223 25 2829 313233343536373839404142 46
Crataegus pinnatifida	32 3637 4142 46
Crataegus tanacetifolia	3 7 29 313233343536 41 46
Crataegus uniflora	35 37 4142 46
Crataegus wilsonii	36
Crataegus Xgrignonensis	46
Crataegus Xlavallei	18 202122 242526272829 31 33 35 37383940 42 46
Crataegus Xprunifolia	33
Crinodendron hookerianum	33 36 38 41 46
Crotalaria capensis	20 22 31 35
Crotalaria cunninghami	33
Crotalaria laburnifolia	2829 3334 37383940 42 46
Crotalaria semperflorens	46
Crowea exalata	46 48
Crowea saligna	1 6 33 40 46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Crowea Xexalta-saligna	50
Cryptomeria japonica	1 356789 11 1718 2021 242526 28293031323334353637 4142 44 464748
Cunninghamia lanceolata	1 35 789 46
Cunonia capensis	46
Cuphea cyanea	35 7
Cuphea hyssopifolia	46 484950
Cuphea ignea	1 356789 18 20 2223242526272829 3435363738394041 43 46 484950
Cuphea jorullensis	1 6 9 18 20 2223242526272829 33 35
Cuphea micropetala	37 46
Cuphea Xpurpurea	35
Cupressus arizonica	31 343536373839404142 44 46 48 50
Cupressus cashmeriana	46
Cupressus glabra	46
Cupressus goveniana	567 9 11 12 1718 2021 242526 2930
Cupressus lusitanica	1 356789 11 1718 2021 242526 29 343536 3839 44 46
Cupressus macnabiana	7
Cupressus macrocarpa	1 356789 11 12 1718 2021 24252627282930313233343536373839404142434 46 48 50
Cupressus sempervirens	1 3567 9 11 1718 20 242526 2829 31323334353637 4041424344 46 48 50
Cupressus torulosa	1 356789 11 2021 2425262728293031 33343536373839 42 46 48 50
Cussonia spicata	18 222324 26 46
Cussonia thyrsiflora	1
Cyathea cunninghami	22
Cyathodes acerosa	31 36
Cycas media	6
Cycas revoluta	6 14
Cydonia chinensis	7 3
Cydonia oblonga	1235 91011 14 1819 2324 26 29 3134 343537 4142 49
Cyperus alternifolius	7 18 2021222324 26
Cyperus papyrus	20 2324 48
Cyphomandra betacea	18 2324 2627 42 46
Cyrilla racemiflora	46
Cytisus albus	56789 11 202122 24252627282930313233 42 47
Cytisus austriacus	1 6

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Cytisus battandieri	46
Cytisus canariensis	1 3 7 9 20 22 24252627 29 33
Cytisus fragrans	282930 3334 3839 42
Cytisus hirsutus	1
Cytisus linifolius	1 46
Cytisus multiflorus	4647
Cytisus nigricans	1 20 22
Cytisus purpurea	1
Cytisus racemosus	1 3 46 4950
Cytisus scoparius	5 8 12 17 20212223242526272829303132333435 37 40 42 47
Cytisus spachianus	1 56 18 23 2526
Cytisus Xburkwoodii	3536 42 46
Cytisus Xdallimorei	31
Cytisus Xlilacti.e	31 33 353637 40 42 47
Cytisus Xpraecox	353637 43 47
Daboecia azorica	46
Daboecia cantabrica	1 5 89 18 2021222324252627282931 32 3536373839 4243 46
Dacrydium cupressinum	7 9 3132 3637 46
Dacrydium franklinii	1 7 9 11 18 20 242526 2829 31 33 37 46
Dais cotinifolia	22 4142 4647 49
Dampiera diversifolia	46 484950
Dampiera rosmarinifolia	46
Daphne cneorum	46
Daphne collina	7
Daphne genkwa	1
Daphne laureola	1 35
Daphne mezereum	3 7
Daphne odora	1 356789 11 18 20212223242526272829 31 33 3536373839404142 46 49
Daphne Xburkwoodii	46
Daphne Xhybrida	1 3 789 11
Darwinia citriodora	22
Darwinia homoranthoides	50
Darwinia lejostyla	33

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Dasylirion arostrichum	18 23 2526
Dasylirion serratifolium	20 222324252627
Daubentonia longifolia	1
Davidia involucrata	33 46
Delonix regia	1 5 22
Dendrocalamus strictus	1 22
Dendropanax trifidus	6
Desfontainea spinosa	33 42 46
Deutzia corymbosa	3 67
Deutzia crenata	67 9 11 18 202122232425262728293 32 36
Deutzia gracilis	1 356789 11 18 202122232425262728293031 333435363738394041 43 46 50
Deutzia longifolia	31 35
Deutzia scabra	1 356789 11 18 20212223242526 2829 31
Deutzia setchuenensis	32
Deutzia vilmoriniae	35
Deutzia Xkalmiiiflora	42 46
Deutzia Xlemoinei	23 25262728293031 33 35
Deutzia Xmagnifica	46
Deutzia Xrosea	30 46
Dichroa febrifuga	1
Dicksonia antarctica	6 20 22 28
Dicksonia squarrosa	6 20 22
Dicksonia youngiae	20 22
Diervilla Xsplendens	36 41
Dillwynia ericifolia	33
Dillwynia floribunda	33
Dillwynia juniperina	33
Dioscorea discolor	7
Diosma ericoides	1 3 7 9 11
Diospyros ebenum	
Diospyros kaki	1 6 11 14 1819 2324 2627 29 3132 3536 4142 46 49
Diospyros lotus	1 33
Diospyros virginiana	67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Dipelta floribunda
Dipilopappus filifolius
Diplazium thwaitesi
Diploglottis australis
Diplolaena grandiflora
Diplothemium maritimum
Disanthus cercidifolius
Distictis buccinatoria
Dizygotheca elegantissima
Dizygotheca veitchii
Dodonaea triquetra
Dodonaea viscosa
Dolichos lablab
Dolichos lignosus
Dombeya burgessiae
Dombeya tiliacea
Doryanthes excelsa
Doryanthes palmeri
Doryphora sassafras
Dovyalis caffra
Doxantha capreolata
Dracaena deremensis
Dracaena draco
Dracaena fragrans
Dracaena goldieana
Dracaena sanderana
Drimys aromatica
Drimys colorata
Dryandra formosa
Dryandra praemorsa
Dryandra speciosa
Dryopteris richardsii
Duranta repens

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Eccremocarpus scaber	3567 9 17 212223 27
Echites andrewsii	1
Echium candicans	6 9 18 2021222324 272829 46
Echium fastuosum	46
Edgeworthia papyrifera	1 3
Ehretia tinifolia	1
Elaeagnus angustifolia	6
Elaeagnus commutata	7
Elaeagnus latifolia	22
Elaeagnus multiflora	32 42
Elaeagnus pungens	29 36373839 46 4849
Elaeagnus umbellata	67 9 18 2122232425262728 32 3536 404142
Elaeocarpus grandis	5
Elaeocarpus reticulatus	7 21 23 2526 30 33 40
Embothrium coccineum	33 36
Enkianthus campanulatus	33 3536 38 40 46
Enkianthus cernuus	36 46
Ensete ventricosum	2324252627 30
Entelea arborescens	567 18 20 2223 2526 28 46
Epacris impressa	9 46
Epacris longiflora	1 6 9 23 46 50
Epiphyllum phyllanthus	1 3 11 20
Eranthemum pulchellum	567
Ercilla spicata	1
Eremaea beaufortioides	46
Eremophila alternifolia	46
Eremophila divaricata	50
Eremophila gibbifolia	46
Eremophila longifolia	46
Eremophila maculata	3 46 48
Eremophila scoparia	48
Erica abientina	46
Erica arborea	6 9 18 202122 242526

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Erica baccans	1 3 6 9 202122 242526 2829 31 36 46
Erica bauera	1 3 6 9 18 202122 242526 2829 31 46 50
Erica canaliculata	46 49
Erica carnea	33 35 46 48
Erica cerinthoides	6 9 18 202122 242526 29
Erica ciliaris	6
Erica cinerea	35 46
Erica colorans	46
Erica concinna	46
Erica cruenta	6 9 18 202122 2526 2829 31 3536 46
Erica dawn	3536373839 41
Erica formosa	6 242526 29
Erica gracilis	40
Erica holosericea	2122 2526 29 36 46 50
Erica hyemalis	6 9 18 202122 242526 29
Erica jubilee	2122 242526 28 31
Erica lateralis	46
Erica linnaeoides	6 18 202122 242526 29 31 353637 46 48 50
Erica lusitanica	242526 29
Erica mackinnoniae	18 202122 2526 29
Erica mammosa	1 6 9 18 202122 242526 29 46
Erica mediterranea	36 40 48
Erica melanthera	6 18 202122 242526 2829 31 34353637 40414243 48 50
Erica multiflora	1 9 31 35 37 46
Erica nudiflorum	1
Erica oatesi	36 40 46
Erica parviflora	1
Erica persoluta	6 9 202122 24 36 46
Erica perspicua	46
Erica peziza	46
Erica pinea	1 46
Erica pyramidalis	6 18 202122 242526 29 31 37
Erica regerminans	202122 242526 29

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Erica regia	46
Erica rubens	6 9 18 202122 242526 29 50
Erica taxifolia	46
Erica tetralix	6 9 18 202122 242526 29 31 33 35
Erica tricolor	6
Erica vagans	6 33 46
Erica ventricosa	3 6 9 18 202122 242526 29 36 39
Erica verticillata	1 3 6
Erica vestita	2122 242526 29 46
Erica Xaurora	40 46 50
Erica Xautuminalis	6 9 13 202122 242526 29 31 3536373839 41 46
Erica Xcavandishii	6 9 18 202122 242526 29 46
Erica Xdarleyensis	35 3738 46 4950
Erica Xintermedia	2122 242526 2829 31 35
Erica Xlambertiana	2526 29
Erica Xormondi	46
Erica Xwebbleyiana	18 202122 242526 2829 31 3536 46
Erica Xwilmorei	6 9 18 202122 242526 29 31 3536373839 41 46
Eriobotrya japonica	1 3567891011 14 1819202122324252627 29 31 333435 4142 46 49
Eriocephalus africanus	22 35 42 46
Eriostemon buxifolium	3 40
Eriostemon lanceolatus	40
Eriostemon myoporoides	6 18 2021222324252627282930313233343536373839404142 43 46 484950
Eriostemon obovalis	2829 31 33 35 40
Eriostemon verrucosus	46
Eriostemon Xstardust	49
Erythrina acanthocarpa	23 2829 31 33 35 37 46
Erythrina blakeii	1 3 2526 28293031 3334353637
Erythrina caffra	1 3 18 20 22 31
Erythrina corrallodendrum	1 3 9 35
Erythrina crista-galli	1 356789 11 18 202122324252627282930313 333435 37383940 42 46
Erythrina herbacea	1 3 31
Erythrina humeana	1 2425262728293031 3435 37

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Erythrina secundifolia		7										
Erythrina speciosa				18	20212223							
Erythrina subumbrans	1											
Erythrina variegata	1			18			30	33				
Erythrina vespertilio	1											
Erythrina Xbidwillii	1											
Erythrina Xhendersoni					23	25						
Escallonia bifida	1	567	9 11	18	20212223	24252627	28293031		3536			46
Escallonia laevis	1	3 67	9		202122	27	293031					46
Escallonia rosea									36		43	49
Escallonia virgata												46
Escallonia Xexoniensis				18	20212223	24252627	282930	33	36			
Escallonia Xlangleyensis						27	29 31	33	353637		42	46
Escallonia Xrockii							31	333	4353637	383940	42	46
Eucalyptus acmenoides						26						
Eucalyptus aggregata												48
Eucalyptus alpina					24	2627		31	33	35	44	
Eucalyptus amygdalina			12	17	2021	24	26272829	31	33	35	40	
Eucalyptus astringens											44	
Eucalyptus bicostata											44	46 48 50
Eucalyptus bosistoana						26					40	44
Eucalyptus botryoides					21	24252627	28293031	32333435	3637	38394041		44 46 48 50
Eucalyptus bridgesiana		11		17	202122	24	2627 29	31	33		40	
Eucalyptus burdettiana											40	
Eucalyptus caesia								31	33	35	383940	44 46 4849
Eucalyptus calophylla		6		18	20212223	24252627	28293031	32333435	3637	38394041		44 46 48 50
Eucalyptus camaldulensis			11a12	17	202122	24	2627	31	33	35	383940	44 46 48 50
Eucalyptus capitellata									33		40	
Eucalyptus cinerea											40	48
Eucalyptus citriodora		6		1718	20212223	242526272829		31323334	35363738	394041	4344	46 48 50
Eucalyptus cladocalyx				1718	20212223	24252627	28293031	32333435	3637	38394041	44	46 48 50
Eucalyptus cneorifolia					20							
Eucalyptus coccifera												46

	1850	- 1870	- 1880	- 1890	- 1900	- 1910	- 1920	- 1930	- 1940	- 1950	-1960	- 1970
Eucalyptus cordata												48
Eucalyptus cornata				1718	21	2324252627		3031	33	35	40	44	48
Eucalyptus cosmophylla										35	40	44
Eucalyptus crebra					21	24			33		40	44
Eucalyptus crenulata												44	46	50
Eucalyptus crucis								31		35	40		46
Eucalyptus delegatensis								31				
Eucalyptus desmondensis											40		46
Eucalyptus diversicolor					21	24	26		33	35			
Eucalyptus diversifolia				17									
Eucalyptus dives									33		40		48
Eucalyptus elata												44		50
Eucalyptus eremophila						23	27	29	31		40		46	48
Eucalyptus erythrocorys								29	31	33	40		46	48
Eucalyptus erythronema										33	40		46	48
Eucalyptus eximia											40			
Eucalyptus fastigata										33	40			
Eucalyptus fibrosa				17	21	24	2627			33				
Eucalyptus ficifolia					2021222324252627282930313 2									
Eucalyptus ficifolia	6			1718	2021222324252627282930313233343536373839404 1							4344	46	4849
Eucalyptus forrestiana										35	40	44	46	4849
Eucalyptus globulus	56789	1111a12		1718	202122232425262728293 1				33343536	38394041			46	48	50
Eucalyptus gomphocephala					21	24	27	3031	333435	37383940		44	46		
Eucalyptus goniocalyx				17	21	24									
Eucalyptus goniocalyx				17	2021	24									
Eucalyptus grossa									33				46		
Eucalyptus gummifera				17	21	24	27	29	33		40		46		
Eucalyptus gunnii				17	21	24	26		33						50
Eucalyptus haemastoma					21	24			33				46		
Eucalyptus incrassata									33						
Eucalyptus intertexta											40				
Eucalyptus kitsoniana												44	46		
Eucalyptus kruseana													46	48	

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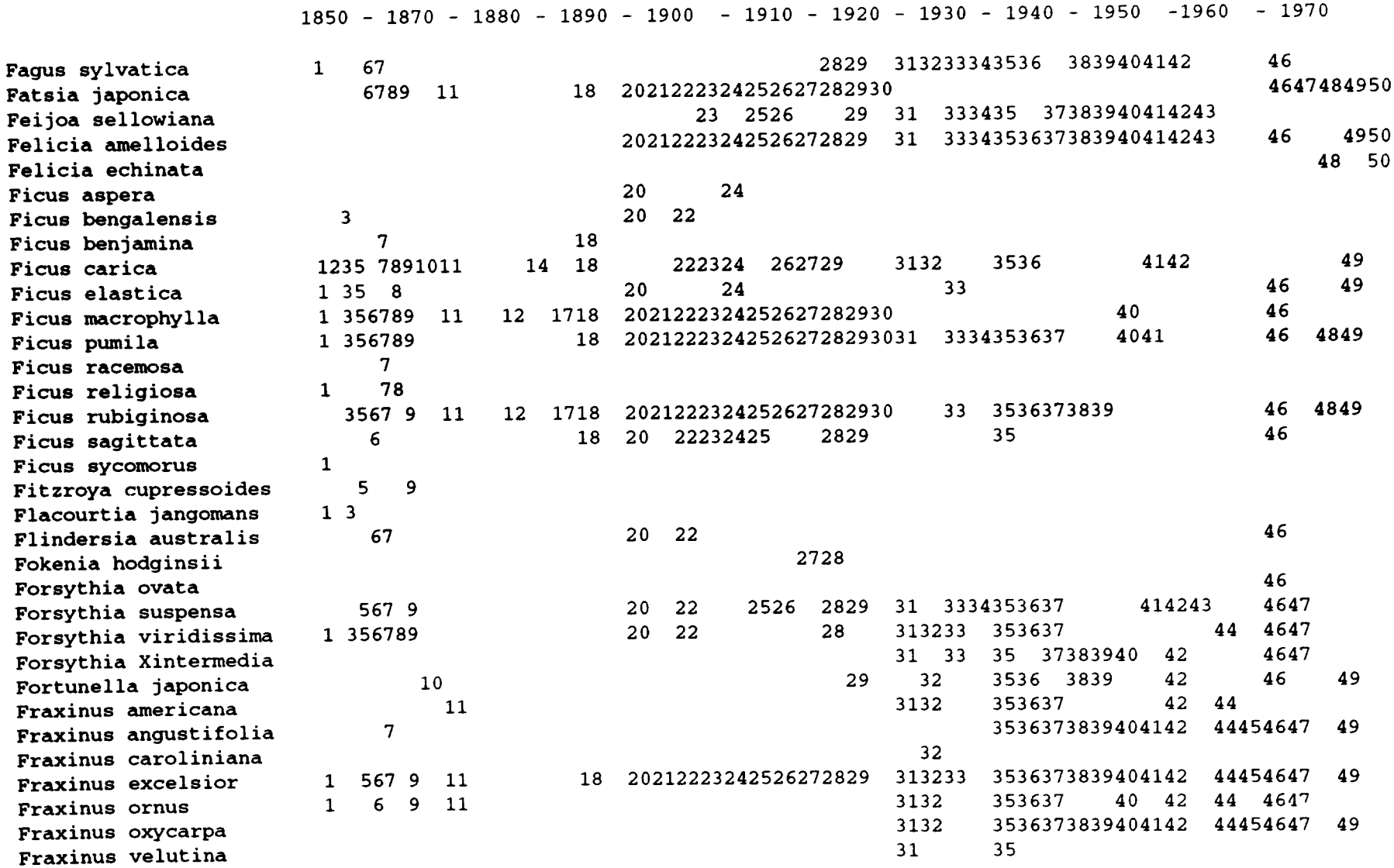
Eucalyptus lansdowneana	46
Eucalyptus largiflorens	17 21 24
Eucalyptus lehmannii	202122 24 26272829 31 333435 40 46 48
Eucalyptus leucoxylon	6 12 1718 212223242526272829 31 333435 40 44 46 48
Eucalyptus linearis	46 48
Eucalyptus longifolia	21 24 29 33 40
Eucalyptus macarthurii	33 35 40
Eucalyptus macrocarpa	2829 31 33 35 383940 46
Eucalyptus macrorhyncha	24 33 40
Eucalyptus maculata	2627 31 33 35 37 40 44 46 484950
Eucalyptus maidenii	29 33 48 50
Eucalyptus mannifera	48
Eucalyptus marginata	67 11 12 1718 21 2324252627 33 40
Eucalyptus megacarpa	35 46 48
Eucalyptus melanoxylon	30
Eucalyptus melliodora	21 24 26 31 33 35 40 44 46 48 50
Eucalyptus microcorys	27 31 33 35 40
Eucalyptus mitrata	48
Eucalyptus moluccana	21 24 33 40 44
Eucalyptus moorei	48
Eucalyptus muelleriana	24 26 29 33 35 40 44
Eucalyptus nicholii	44 46 484950
Eucalyptus nutans	40 46 48
Eucalyptus obliqua	12 17 21 24 27 29 31 33 40 44
Eucalyptus obtusifolia	21 24
Eucalyptus occidentalis	27 44 48
Eucalyptus oldfieldii	33 40 46 48
Eucalyptus orbifolia	8 46
Eucalyptus ovata	11a 46 48 50
Eucalyptus paniculata	24 33 40
Eucalyptus patens	29
Eucalyptus perriniana	44 46 48 50
Eucalyptus pilularis	21 24 27 29 31 33 35 40

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Eucalyptus piperita	11a 21 24
Eucalyptus platypus	29 33 35 40 48
Eucalyptus polyanthemos	17 21 24 33 35 40 44 48
Eucalyptus populnea	33 40
Eucalyptus preissiana	29 31 333536 3940 46
Eucalyptus punctata	21 29 33 40
Eucalyptus pyriformis	29 33 40 46
Eucalyptus radiata	31 46
Eucalyptus regnans	21 24 31 33 35 40 46
Eucalyptus resinifera	12 21 24 33 40
Eucalyptus rhodantha	48
Eucalyptus risdonii	29 35 46 48
Eucalyptus robusta	21 24 27 29 31 33 35 37 40 44 46
Eucalyptus rubida	27 29 44
Eucalyptus saligna	21 27 29 33 40 48 50
Eucalyptus salmonophloia	46
Eucalyptus scoparia	48 50
Eucalyptus sepulcralis	46 48
Eucalyptus sideroxylon	26 31 33 35 40 44 46 48 50
Eucalyptus sieberi	21 24 2627 29 31 33
Eucalyptus smithii	27 29
Eucalyptus spathulata	44 46 48 50
Eucalyptus steedmanii	33
Eucalyptus stellulata	48
Eucalyptus stoatei	40 46 48
Eucalyptus stricklandii	31 33 3536 40 46 48
Eucalyptus stricta	9 35
Eucalyptus tereticornis	33 40
Eucalyptus tetragona	20 33 40 46
Eucalyptus tetraptera	31 33 35 40 46
Eucalyptus torquata	2728293031 33 3536 38 44 46 48
Eucalyptus viminalis	17 21 24 2627 29 31 33 35 44 46 48 50
Eucalyptus virdis	46 50

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Eucalyptus woodwardii	46
Eucryphia glutinosa	33
Eugenia brasiliensis	18 23 2526
Eugenia eucalyptoides	6 18 2021222324252627 29
Eugenia uniflora	1 7
Euonymus alatus	33 353637 46
Euonymus europaea	1 356 313233343536373839 40 42 46
Euonymus fimbriata	18 20 2223 2526
Euonymus fortunei	67 9 18 20 2223 2526 29 31 3536 46 48 50
Euonymus hamiltoniana	35 37 46
Euonymus japonicum	1 3567 9 11 18 20212223 2526 2829 31 33343536373839404142 43 46 48 50
Euonymus latifolia	6 9 18 20212223 2526 2829 32 34
Euonymus obovata	23 2526
Eupatorium megalophyllum	35
Eupatorium riparium	18 20 222324252627 29
Eupatorium sordidum	1 35 46
Euphorbia fulgens	1 3 678 46
Euphorbia milii	46
Euphorbia pulcherrima	5 78 11 2829 31 33 35 41 46
Euphorbia splendens	1 356789 11 18 2021222324252627282930 33 35 37
Euphorbia wulfenii	3031 3435 37 46
Eupomatia laurina	1 7 46
Eurya japonica	3
Euryops athanasiae	46
Euryops pectinatus	5 46
Eutaxia empetrifolia	23 2526 293031 33 35 4243
Eutaxia microphylla	40 46
Eutaxia myrtifolia	20 22 33
Eutaxia obovata	46
Euterpe edulis	202122
Exochorda racemosa	29 31 3435 37 46
Fabiana imbricata	6789 18 212223242526272829 33 3536 41
Fagelia bituminosa	1 35 7


1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Fagus sylvatica
Fatsia japonica
Feijoa sellowiana
Felicia amelloides
Felicia echinata
Ficus aspera
Ficus bengalensis
Ficus benjamina
Ficus carica
Ficus elastica
Ficus macrophylla
Ficus pumila
Ficus racemosa
Ficus religiosa
Ficus rubiginosa
Ficus sagittata
Ficus sycomorus
Fitzroya cupressoides
Flacourtia jangomans
Flindersia australis
Fokenia hodginsii
Forsythia ovata
Forsythia suspensa
Forsythia viridissima
Forsythia Xintermedia
Fortunella japonica
Fraxinus americana
Fraxinus angustifolia
Fraxinus caroliniana
Fraxinus excelsior
Fraxinus ornus
Fraxinus oxycarpa
Fraxinus velutina

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Fraxinus xanthonyloides	3031
Fremontodendron californicum	46
Furcraea bedinghausii	2122
Furcraea foetida	1 35 7 24
Gamolepis euryopoides	20
Gardenia devoniana	1 3
Gardenia jasminoides	1 356789 11 18 202122232425262728293536373839404142 46 48 50
Gardenia lucida	1 3
Gardenia thunbergia	1 35678 11 18 20212223242526272829303536 46
Garrya elliptica	67 11 18 20 2223242526272829 313233 353637383940414243 46 484950
Garrya Xthuretti	24
Gaultheria hispida	46
Geitonoplesium cymosum	3
Gelsemium sempervirens	1 3567 9 11 18 20212223242526272829303536 37 42 46 484950
Genista aethnensis	272829303132 3536
Genista anglica	1
Genista ephedroides	20 23 2526 2829 33
Genista monosperma	23 2526 293031 3334 3637383940 46 4849
Genista monspessulana	18 22
Genista tinctoria	202122 31 35 37
Ginkgo biloba	1 3567 9 18 20 242526 28293031323334353637383940 4142 4647
Gleditsia japonica	7
Gleditsia sinensis	1 3
Gleditsia triacanthos	1 5 7 202122 28 3536 46
Glochidion ferdinandi	7
Gloriosa superba	6
Gmelina asiatica	1
Gompholobium grandiflorum	33 40
Gompholobium latifolium	33
Goodenia macmillanii	7
Goodia lotifolia	8 18 20 23 2526 28293031 33 40
Gordonia axillaris	20 22 2829 31 333435363738394041424 3 46 48
Gossypium arborea	5

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Gossypium sturtianum	7 46
Graptophyllum pictum	1 3
Grevillea acanthifolia	40 50
Grevillea alpina	6 18 202122 24252627 29 33 36
Grevillea aquifolium	46 48
Grevillea aspleniifolia	252627 31 3334353637 40 46
Grevillea audrayae	48
Grevillea banksii	6 9 40 46 48 50
Grevillea barklyana	46 484950
Grevillea bipinnatifida	33 46
Grevillea biternata	46 484950
Grevillea bractosa	33 40
Grevillea brevicuspis	484950
Grevillea buxifolia	3 33 40
Grevillea caleyi	1 34
Grevillea capitellata	46 48 50
Grevillea concinna	3
Grevillea confertifolia	46 50
Grevillea crithmifolia	50
Grevillea diminuta	46 48 50
Grevillea dimorpha	6 18 20 22 46
Grevillea endlicheriana	46 48 50
Grevillea excelsior	33 40
Grevillea fasciculata	46
Grevillea glabella	484950
Grevillea glabrata	46 48 50
Grevillea hilliana	67 9 11 21 2526 29 3334 40
Grevillea hookerana	46 4950
Grevillea ilicifolia	42 50
Grevillea jenkinsii	36 40 42 50
Grevillea jephcottii	50
Grevillea johnsonii	
Grevillea juniperina	18 2526 37 46 484950

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Grevillea lanigera	50
Grevillea laurifolia	46 4950
Grevillea lavandulacea	46 484950
Grevillea leucopteris	38
Grevillea linearifolia	28 31 35 37 46 50
Grevillea longifolia	7
Grevillea longistyla	46
Grevillea miqueliana	46 48
Grevillea montana	33
Grevillea oleoides	27 353637 42 46 50
Grevillea polybotrya	33 40
Grevillea punicea	27 40 46 4849
Grevillea repens	46 484950
Grevillea rivularis	50
Grevillea robusta	1 356789 11 12 1718 202122232425262728 29 31 33343536373839404142 4344 46 484950
Grevillea rosmarinifolia	3 272829 31 3334353637 4041424344 46 484950
Grevillea sericea	3 46 48 50
Grevillea shiressii	484950
Grevillea speciosa	50
Grevillea thelemanniana	31 3536 46 48 50
Grevillea tridentifera	46
Grevillea trinervis	50
Grevillea triternata	50
Grevillea victoriae	46 48
Grevillea williamsonii	3637
Grevillea wilsonii	33 40
Grevillea Xclearviewdavid	46 484950
Grevillea Xclearviewrobin	50
Grevillea Xcrosbie morris	46 484950
Grevillea Xgaudichaudii	48 50
Grevillea Xivanhoe	46 4849
Grevillea Xolympic flame	46
Grevillea Xpink pearl	46 48 50

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Grevillea Xpoorinda alice	46
Grevillea Xpoorinda ruby	46 48 50
Grevillea Xpoorindabeauty	46 48
Grevillea Xpoorindablondi	46 50
Grevillea Xpoorindaelegan	46 48 50
Grevillea Xpoorindaleane	46 48 50
Grevillea Xpoorindapeter	46 49
Grevillea Xpoorindaqueen	46 484950
Grevillea Xpoorindarondea	50
Grevillea Xpoorindaroyalmantel	50
Grevillea Xrobyngordon	50
Grewia occidentalis	7 18 20 2223 2526
Greyia sutherlandii	18 31 35 37
Griselinia littoralis	7 36 3839 4142 44 46
Griselinia lucida	6
Gymnocladus dioica	6
Gynura aurantiaca	6 18 25
Hakea acicularis	5 7 33
Hakea bucculenta	46 48
Hakea conchifolia	46
Hakea cycloptera	33
Hakea dactyloides	33 46
Hakea elliptica	20 22 3132 35 46
Hakea eriantha	46 48
Hakea laurina	56789 12 1718 202122232425262728293031323334353637383940 41 44 46 484950
Hakea leucoptera	23 2526 46 48
Hakea multilineata	33
Hakea nodosa	7
Hakea petiolaris	35 37 46
Hakea purpurea	46
Hakea salicifolia	4950
Hakea saligna	67 31 33 35 43 46 48 50
Hakea suaveolens	67 9 18 20212223 2526 35 44 46 484950

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Hakea ulicina	22
Hakea victoriae	5 9 46
Halesia carolina	46
Halesia tetraptera	1 3 26 33
Halimium lasianthum	67 9 20 22
Hamamelis mollis	33 42 46
Hamamelis virginiana	33
Hardenbergia comptoniana	567 11 18 202122232425262728293031 3334353637 40 46
Hardenbergia violacea	356789 1718 202122232425262728293031 33 353637 40 46 4950
Harpephyllum caffrum	2526 2829 34 42
Hebe albicans	46
Hebe armstrongi	46
Hebe buxifolia	67 9 11 18 20 2223 25262728 47484950
Hebe cupressoides	20 22 3637 41 46
Hebe diosmifolia	6 18 20 2223 252627 3334 37 46 48
Hebe elliptica	5 7 9 36 3839 46 48 50
Hebe glaucophylla	46 48
Hebe hectorii	56
Hebe hulkeana	67 9 18 20 2223 25262728 31 333435 373839404142 46
Hebe parvifolia	567 9 18 20 2223 252627 31 333435 37
Hebe salicifolia	1 35 7 11 18 23 2526 34 46 484950
Hebe speciosa	3567 9 11 18 20 2223 252627 3334353637383940 4243 46474849
Hebe Xandersonii	1 3567 9 11 18 20 2223 25262728 31 3334353637383940 4243 46 50
Hebe Xla seduisante	46
Hebe Xlobelioides	6 18 20 2223 252627 34 36 4748 50
Hebe Xwairiki	48
Hedera canariensis	567 9 18 20 2223 252627 29 31 33 35 37 46
Hedera colchica	6
Hedera colchica	6 20 22 35 37
Hedera helix	1 356789 18 20 2223242526272829 31 3334 37 40 42 46 48
Hedera rhombea	6 20 22 27
Hedycarya arborea	46
Hedychium coronarium	3 7 12 1718 2425 31

	1850 -	1870 -	1880 -	1890 -	1900 -	1910 -	1920 -	1930 -	1940 -	1950 -	1960 -	1970
Hedyscepe canterburyana		6			20212223242526							
Helichrysum obcordatum												50
Hemiandra pungens												50
Heterocentron elegans					20 22	26						49
Heteromeles arbutifolia	1 3	6789	11	12	2122	27		33				
Hibbertia aspera											46	48 50
Hibbertia obtusifolia												50
Hibbertia scandens					202122						46	4849
Hibbertia sericea										40		
Hibbertia stellaris											46	50
Hibiscus calyphyllus					20 2223242526							
Hibiscus grandiflorus		3 7 9										
Hibiscus heterophyllus					20	2728				40	46	
Hibiscus huegelii				18						40	46	50
Hibiscus moscheutos	1						29	34				
Hibiscus mutabilis	1 35 7					27				40		
Hibiscus parkerii rosea			11									
Hibiscus pedunculatus	1			18	20 2223	25262728		35				
Hibiscus radiatus	1											
Hibiscus rosa-sinensis	1 35678		11	18	20 222324252627282930 31			3334353637383940		4243		4950
Hibiscus splendens	1 3567 9		11		20 22 2425 27						46	
Hibiscus syriacus	1 3567 9		11	18	2021222324252627		29303132333435		37383940	4243		
Hibiscus tiliaceus		3									46	
Hibiscus wrayi												
Histiopteris incisa		6										
Hoheria lyallii					23							
Hoheria populnea				18	22	2526		343536373839		41424344	46	484950
Holboellia latifolia		3										
Holmskioldia sanguinea	1 3											
Homalocladium platycladum					24			36				
Hovea celsii	1 3									40	46	
Hovea chorizemifolia										40		
Hovea longifolia											46	

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Hovea trisperma	33
Hovenia dulcis	1 35
Howea belmoreana	6 20212223242526 28
Howea forsterana	6 20212223242526 28 34 49
Hoya australis	1 35 7 11 46
Hoya bella	1 35678 46 48
Hoya carnosa	1 356789 11 18 2021222324252627282930313334 37 40 46 48
Hoya globosa	20
Hoya imperialis	3 24
Hydrangea anomala	3 46
Hydrangea arborescens	33
Hydrangea aspera	46
Hydrangea macrophylla	1 356789 11 18 202122232425262728293031323334353637383940414246
Hydrangea paniculata	6 18 202122 242526 28 31 3536 3839404142 46
Hydrangea quercifolia	46
Hylocereus triangularis	1
Hymenaea courbaril	1
Hymenanthera crassifolia	36
Hymenosporum flavum	5 789 20 22 2526 2930 46
Hyophorbe verschaffeltii	23 2526
Hypericum calycinum	1 3 6 8 20 22 31 46 49
Hypericum chinense	3536
Hypericum hookeranum	46
Hypericum leschenaultii	46
Hypericum oblongifolium	7
Hypericum olympicum	1
Hypericum patulum	6 3132 353637383940 42 46 49
Hypericum reptans	20 22
Hypericum Xmoseranum	18 20 222324252627 293031 333435363738394041424346 49
Hypocalymma angustifolium	46 49
Hypocalymma cordifolium	46 4950
Hypocalymma robustum	46
Iboza riparia	35 37 46

	1850 -	1870 -	1880 -	1890 -	1900 -	1910 -	1920 -	1930 -	1940 -	1950 -	1960 -	1970
Idesia polycarpa								33	353637383940	42		46
Ilex aquifolium	12356789	11		18	20212223242526272829303132333435	36			3839404142	44	46	48
Ilex cornuta	1 357 9				20 22				35			46
Ilex crenata									35			
Ilex insignis	7				20 22							
Ilex paraguariensis					22							
Illicium anisatum	1 35 7 9	11			202122							
Impatiens oliveri												46
Indigofera australis	3		12	18		27	29	3334	36	383940		46
Indigofera gerardiana												48
Indigofera incarnata	1 356789			18	202122232425	2728		3334		41		
Indigofera potaninii								33				
Iochroma coccinea												46
Iochroma cyaneum	6 8				20 22	26	29	33		40		46
Iochroma fuchsiodes							29					
Iochroma grandiflora							29 31					
Ipomoea acuminata	356789	11		1718	202122232425262728293031			333435	37	40		46
Ipomoea alba				17		27						
Ipomoea palmata	1 3											
Ipomoea purpurea	1											
Isopogon anemonifolius											46	48
Isopogon formosus											46	
Itea virginica								33				
Ixora chinensis	1 3 8											
Ixora coccinea	1 3 8											
Jacaranda acutifolia										40		
Jacaranda mimosifolia	6			18	20212223242526272829303132			33343536	3839	414243	46	48 50
Jacobinia carnea	5										46	
Jacobinia sericea	1 35 8							33				
Jacquinia aurantiaca	1											
Jasminum azoricum										41 43	46	4849
Jasminum beesianum							29 31	33	35 37			
Jasminum didymum	1											

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Jasminum fruticans	1 3 67 9 18 2526
Jasminum grandiflorum	1 356789 11 18 2021222324252627282930 31 3334353637 4041 46
Jasminum humile	1 356789 11 18 2021222324252627 29 31
Jasminum leratti	1 3
Jasminum lineare	1 3
Jasminum mesnyi	26 28 3031 3334353637 4041 43 46 49
Jasminum multiflorum	1
Jasminum nudiflorum	1 356789 11 18 2223242526272829 31 33 35 37 46 48
Jasminum odoratissimum	1
Jasminum officinale	1 3567 11 2021222324252627282946
Jasminum polyanthum	46 484950
Jasminum sambac	1 356 89 11 24
Jasminum suavissimum	20 2223242526 29
Jasminum subhumile	18 20 2223242526
Jasminum volubile	1 3 678 11 18 20 22232425262728
Jasminum Xstephanense	3031 33 35 37
Jovellana violacea	46
Juanulloa aurantiaca	1 3 8
Jubaea chilensis	6 20212223 2526
Juglans nigra	5 11
Juglans regia	123567891011 14 18 20 222324252627 3132 3536 3839 42 47 49
Juniperus bermudiana	1 567 18 2021 242526 28 33 36 46
Juniperus cedrus	29 31
Juniperus chinensis	1 6 89 18 20 242526 2829 31 33 36 40 46 48 50
Juniperus communis	1 3 6789 11 18 20 242526 2829 31 33343536 42 46
Juniperus conferta	1 46
Juniperus deppeana	46
Juniperus drupacea	7
Juniperus excelsa	1 35 7 9 11 18 21 33
Juniperus horizontalis	1 5 78 11 20 24 313233343536 38 4142 46 48
Juniperus oxycedrus	1 56789 11 18 2021 23242526 33
Juniperus procera	343536 3839 42 464748
Juniperus recurva	1 46

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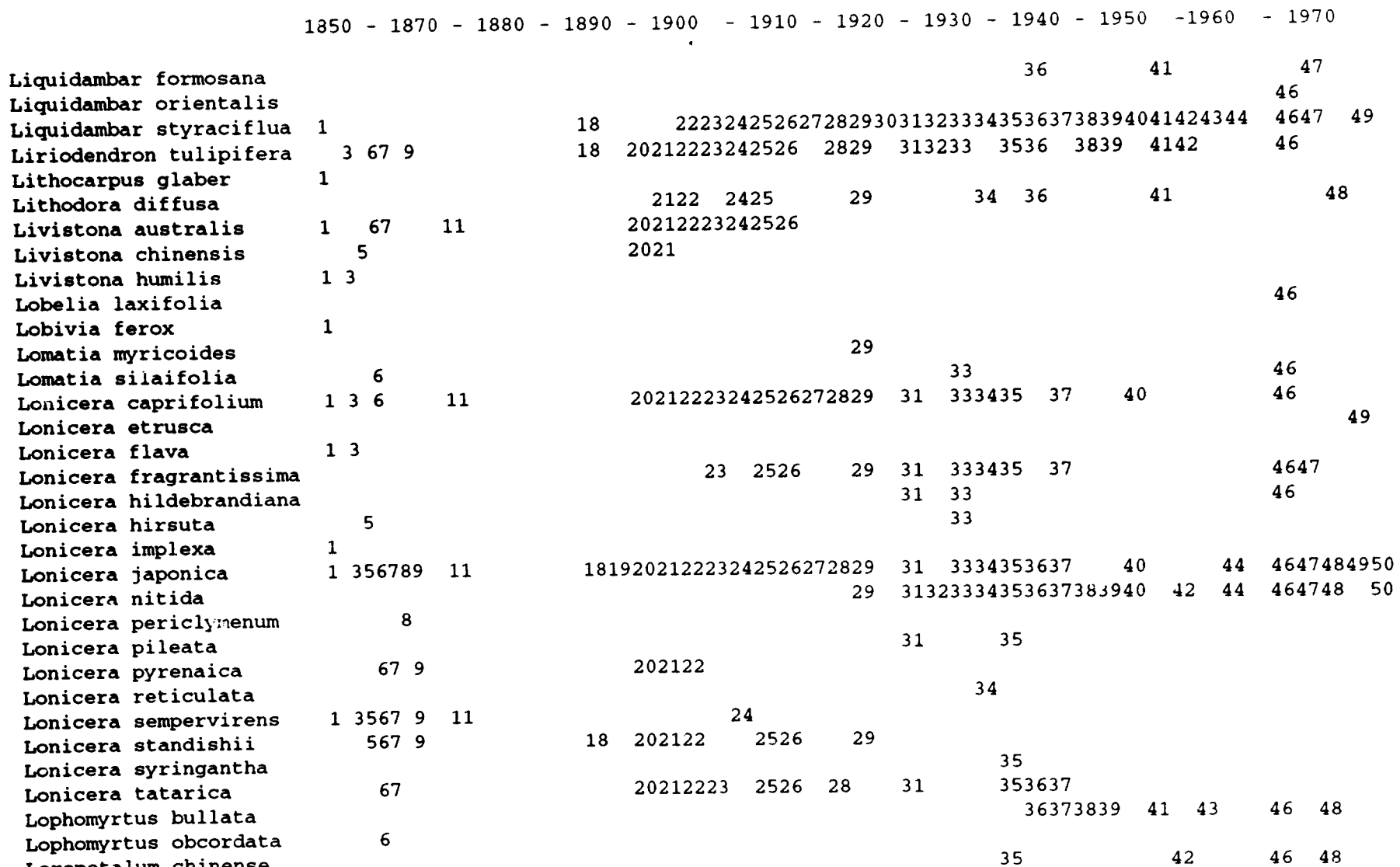
Juniperus sabina	1 35 7 9 18 2021 242526 2829 3536 46 48
Juniperus scopulorum	46 48
Juniperus squamata	7 343536 38 40 42 46
Juniperus virginiana	1 56789 11 2021 24 3334 36 3839 46 48
Juniperus Xmedia	33 46
Justicia adhatoda	1 67 18 20 222324252627
Justicia carnea	1 35 78 11 20 2223242526 2829 33 36 383940
Justicia ghiesbreghtiana	1
Justicia rizzinii	6 9 11 18 2021222324252627 29 33 37
Kalanchoe pinnata	1
Kalmia angustifolia	33 46
Kalmia latifolia	6 2829 31 33343536 3839404142 4647
Kennedia backyiana	202122 46
Kennedia coccinea	3 67 18 2223 40 46
Kennedia macrophylla	21 29 50
Kennedia nigricans	5 78 1718 212223242526272829303132 33 35 40 46
Kennedia prostrata	7 40 46 4849
Kennedia rubicunda	6789 11a 202122 242526272829 31 333435 37 40 43 46 484950
Kennedia stirlingii	40
Kerria japonica	1 356789 18 202122232425262728293031 32 3435 383940 46
Knightia excelsa	46
Koelreuteria paniculata	1 3 20 22 2526272829 313233343536 383940 42 46
Kolkwitzia amabilis	33 3536 404142 464748
Kunzea ambigua	46
Kunzea baxteri	46 4950
Kunzea parvifolia	46
Kunzea pauciflora	46
Kunzea pomifera	46
Kunzea sericea	40
Kydia calycina	1
Laburnum alpinum	1 46
Laburnum anagyroides	1 356789 18 20212223242526272829 313233343536 40 42 47
Laburnum Xwatereri	31 343536 3839 4142 454647

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Lagerstroemia indica	1 3 78 202122 2425262728293031 333435 37383940 42 46
Lagunaria patersonii	1 356789 11 12 1718 20212223242526272829 313233343536373839 41424344 46 484950
Lambertia formosa	33 40
Lambertia inermis	50
Lantana camara	1 3567 9 11a 1718 20 2223 2526272829 31 33 353637383940 46 484950
Lantana crocea	1 356789
Lantana montevidensis	1 356789 18 20 2223 2526272829 31 33 3536373839 46 4950
Lantana trifolia	1 3
Lapageria rosea	6 18 20212223 2526 33 35 37 42 46
Lardizabala biternata	1
Larix decidua	567 11 12 1718 2021 242526 28 31 33343536 38 46
Larix kaempferi	46
Larix Xeurolepis	
Latania loddigesii	6
Latania lontaroides	20212223242526
Laurus canariensis	28
Laurus nobilis	12356789 11 18 2021 232425262728293031323334353637 40 46
Lavandula angustifolia	35 9 1111a12141718 20212223242526272829303133343536373839404142 4647
Lavandula dentata	2526 29 31 35 373839 46
Lavandula stoechas	1 18 20212223242526272829 31 353637383940 42 46 49
Lawsonia inermis	1
Lechenaultia biloba	33 46 50
Lechenaultia formosa	46
Lechenaultia superba	50
Leonotis dysophylla	46
Leonotis leonurus	35 18 202122232425262728293031 3334353637383940 42 46 48
Lepidorrhachis mooreana	2324
Lepidozamia peroffskyana	56 2021222324
Leptolepia novae-zelandia	6 20 22
Leptopteris hymenophylloides	6
Leptospermum ericoides	7
Leptospermum firmum	33
Leptospermum flavescens	1 34 42

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Leptospermum laevigatum	5 7 17 2829 31 333435 383940 42 46 4950
Leptospermum lanigerum	2829 31 46
Leptospermum nitidum	46 48
Leptospermum petersonii	35 37 40 42 45 4950
Leptospermum rotundifolium	35 3839 42 46
Leptospermum scoparium	272829303132333435363738394041424 3 46 484950
Leptospermum squarrosum	46
Lespedeza bicolour	24 28 31
Lespedeza thunbergii	6
Leucaena glauca	1
Leucodendron argenteum	3 6 11 18 20 24252627282930313233 36 38 40 42 46
Leucodendron salignum	46
Leucospermum bolusi	46
Leucospermum catherinae	46
Leucospermum concarpodend	46
Leucospermum nutans	46
Leucospermum reflexum	46
Leucospermum tottum	46
Leucostegia pallida	20 22
Leucothoe fontanesiana	31 33 36 41 46
Leycesteria formosa	1 35 7 23 2526 29 3132 36 46
Libocedrus bidwillii	32 36
Libocedrus doniana	20 2526 36
Libocedrus plumosa	36 46
Ligustrum delavayanum	31 3435363738
Ligustrum japonicum	1 356789 18 20212223 252627282930 323334 36 3839 46
Ligustrum lucidum	1 35 7 9 11 18 2021 23 2526 31 35 37 42 4647
Ligustrum ovalifolium	67 2122 27 29 3132 34353637383940 42 46 49
Ligustrum sinensis	8 28 31 353637 4647
Ligustrum undulatum	567 46
Ligustrum vulgare	1 3567 313233 36 41 47
Limonium arborescens	2122 26
Linospadix monostachya	202122 24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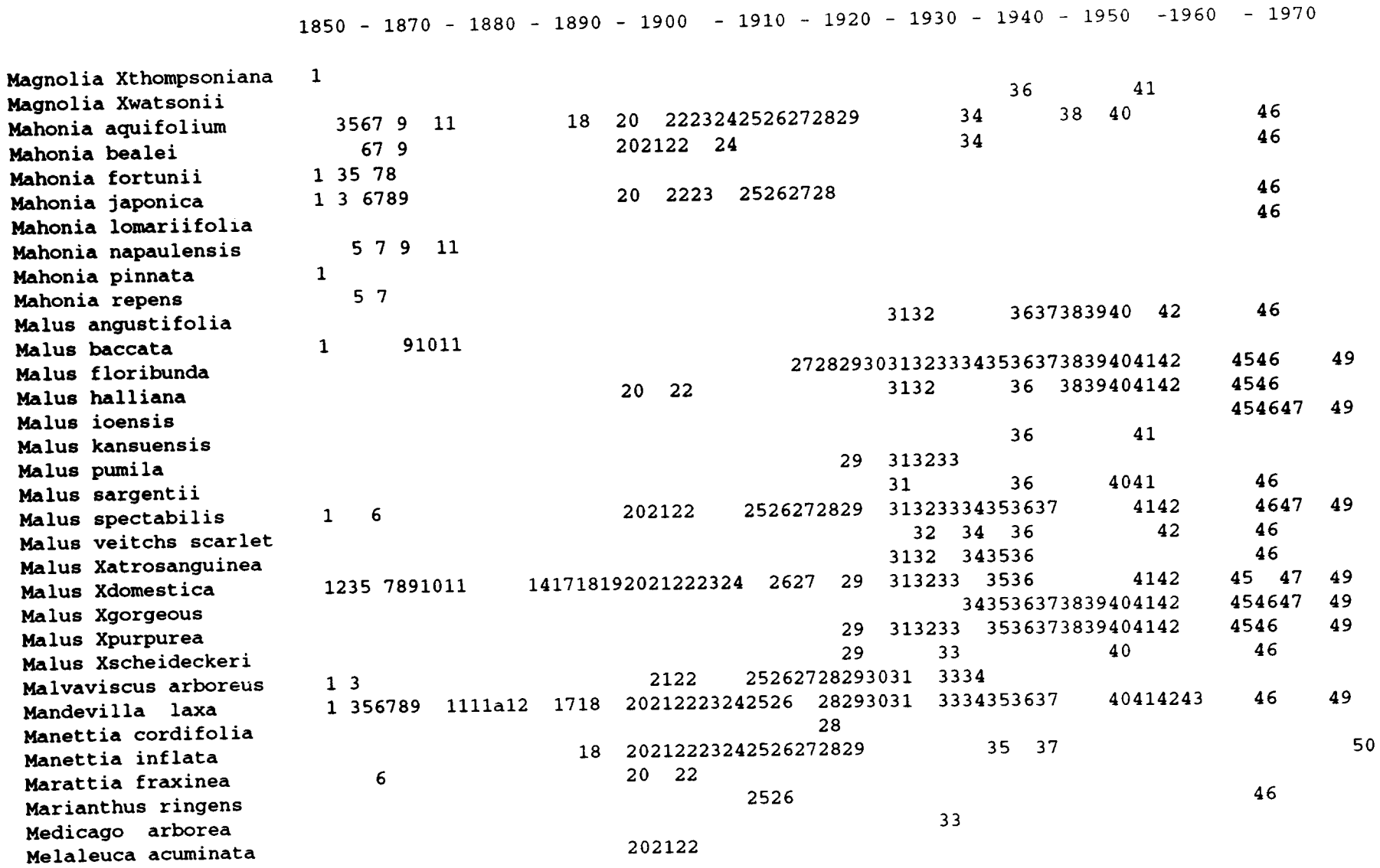
Liquidambar formosana
Liquidambar orientalis
Liquidambar styraciflua
Liriodendron tulipifera
Lithocarpus glaber
Lithodora diffusa
Livistona australis
Livistona chinensis
Livistona humilis
Lobelia laxifolia
Lobivia ferox
Lomatia myricoides
Lomatia silaifolia
Lonicera caprifolium
Lonicera etrusca
Lonicera flava
Lonicera fragrantissima
Lonicera hildebrandiana
Lonicera hirsuta
Lonicera implexa
Lonicera japonica
Lonicera nitida
Lonicera periclymenum
Lonicera pileata
Lonicera pyrenaica
Lonicera reticulata
Lonicera sempervirens
Lonicera standishii
Lonicera syringantha
Lonicera tatarica
Lophomyrtus bullata
Lophomyrtus obcordata
Loropetalum chinense

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Lotus berthelotii	20 2223 2526 2930 333435 37 46 48
Lotus jacobeus	1 7 9 202122
Luculia grandifolia	41 46
Luculia gratissima	1 3 29 313233 353637383940414243 46 4849
Lucuma obovata	1
Luma apiculata	7 9 20 22
Lycium ferocissimum	11a12 17
Lycium horridum	6 2021
Lygodium scandens	6 20 22
Lyonia ligustrina	31 33 3637 41 46
Maba laurina	1 3
Macadamia integrifolia	67 9 11 18 20212223242526272829 31 3435 37 46
Macfadyena unguis-cati	6789 11 18 202122 242526272829 31 33 353637 40 46
Mackaya bella	6 18 20212223242526272829 33 35 373839 42 46
Macleaya cordata	7
Maclura pomifera	1 3567 9 1111a12 17 24 33
Macrozamia communis	3 11
Macrozamia miquelii	6 202122
Macrozamia moorei	6
Macrozamia spiralis	56 20212223
Magnolia acuminata	1
Magnolia campbellii	33 39 42 46
Magnolia co'co	1
Magnolia grandifolia	1 356789 11 18 2021222324252627282930313233343536373839 4142 46 49
Magnolia heptapeta	1 3 67 9 18 20212223242526 29 31 33 35 42 46
Magnolia hypoleuca	2324252627 29 313233 353637 46
Magnolia kobus	27 313233 40 46
Magnolia quinquepeta	1 356789 18 2021222324252627 3334 40 42 46
Magnolia salicifolia	36
Magnolia sieboldii	33 3536 39 42 46
Magnolia stellata	18 212223242526 28 33 36 4142 46 48
Magnolia virginiana	3
Magnolia Xsoulangiana	1 35 789 18 20212223 2526 31 33 353637 39404142 46 48


1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Magnolia Xthompsoniana
Magnolia Xwatsonii
Mahonia aquifolium
Mahonia bealei
Mahonia fortunii
Mahonia japonica
Mahonia lomariifolia
Mahonia napaulensis
Mahonia pinnata
Mahonia repens
Malus angustifolia
Malus baccata
Malus floribunda
Malus halliana
Malus ioensis
Malus kansuensis
Malus pumila
Malus sargentii
Malus spectabilis
Malus veitchs scarlet
Malus Xatrosanguinea
Malus Xdomestica
Malus Xgorgeous
Malus Xpurpurea
Malus Xscheideckeri
Malvaviscus arboreus
Mandevilla laxa
Manettia cordifolia
Manettia inflata
Marattia fraxinea
Marianthus ringens
Medicago arborea
Melaleuca acuminata

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Melaleuca armillaris	5 202122 27 29 44 46 484950
Melaleuca bracteata	50
Melaleuca decora	48
Melaleuca decussata	5 7 44 46 48 50
Melaleuca diosmifolia	46 48
Melaleuca elliptica	35 37 46 48
Melaleuca ericifolia	202122 31 33 35 37 40 44 46 48 50
Melaleuca fulgens	40 42 46
Melaleuca halmaturorum	44 46
Melaleuca huegelii	46 48
Melaleuca hypericifolia	27 29 31 33 353637383940 42 44 46 4849
Melaleuca incana	44 46 484950
Melaleuca lanceolata	40 44 46
Melaleuca lateritia	25262728293031 33 35 37383940 42 46 50
Melaleuca laxiflora	26 46 48
Melaleuca leucadendron	33 40 46
Melaleuca linariifolia	202122 44 46 484950
Melaleuca macronychia	46
Melaleuca megacephala	46
Melaleuca micromera	67 9 202122 46
Melaleuca minutifolia	48
Melaleuca nesophila	35 37 40 43 46 484950
Melaleuca pauperiflora	33
Melaleuca pulchella	35 46 50
Melaleuca purpuliflora	40
Melaleuca radula	46
Melaleuca scabra	46
Melaleuca squamea	29 31 35 46
Melaleuca squarrosa	36 44 46 48 50
Melaleuca steedmanii	33 40 46
Melaleuca styphelioides	202122 272829 31 33 383940 42 44 46 484950
Melaleuca suberosa	46
Melaleuca thymifolia	33 35 40 46 484950

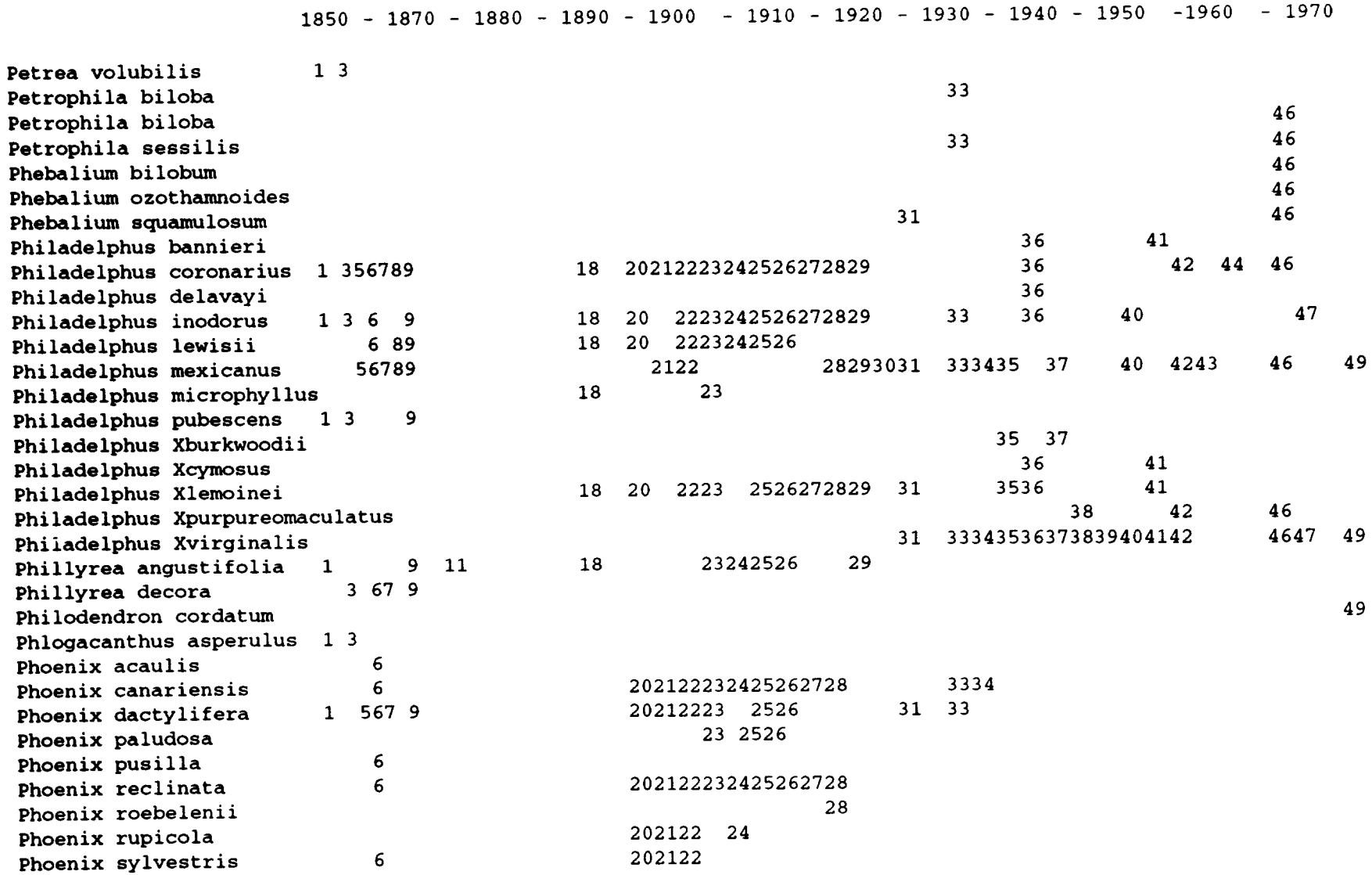
	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Melaleuca violacea	46
Melaleuca wilsonii	5 789 35 44 46 48
Melastoma malabathricum	5 3031 37 46
Melia azedarach	1 5678 11 18 2021222324252627282931 33343536373840 43 4647
Melianthus major	1 35 7 18 202122 2526 46
Melianthus minor	1 18 202122 242526
Melicope ternata	67 9 18
Melicytus ramiflorus	9
Meryta sinclairii	46
Mespilus germanica	1 35 7 91011 14 2324 26 3132 36 42 46
Metasequoia glyptostrob.	46
Metrosideros excelsus	67 9 18 2021222324252627282931 3132333435363738394041 42 46 4849
Metrosideros robusta	7
Metrosideros umbellatus	2526 29 3536 46
Metternichia princeps	1
Michelia figo	1 356789 18 2021222324252627282930313233343537383940 4243 46 4849
Microcoelum weddellianum	6 20212223242526 30
Microlepia pyramidata	6 20 22
Millettia megasperma	31
Mimosa bracaatinga	36
Mimulus aurantiacus	1 3 789 18 242526 2930 33343536 3839 42
Mimulus puniceus	1 3 9 23 2526 28293031323334353637383941 42 46
Mimulus Xhybridus	6 20 22 27
Mirbelia rubiifolia	33
Mirbelia speciosa	1
Miscanthus nepalensis	2021
Miscanthus sinensis	6 1718 212223242526272829
Mitraria coccinea	6 89 18 2021222324252627282931 35 37
Mitriostigma axillare	8
Monstera deliciosa	42 46 49
Montanoa grandiflora	31
Morinda citriodora	7
Morus alba	123567 91011 202122 25262728 313233 3536 46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Morus nigra	1 3567 91011 14 18 2324 26272829 3132 3536 3839 4142 46 49
Muehlenbeckia axillaris	35
Muehlenbeckia complexa	29 31 3334353637 40 46
Muraltia heisteria	1 9 23 2526
Murraya paniculata	1 5 7 49
Musa acuminata	35 7 24
Musa Xparadisiaca	35 7 46
Myoporum acuminatum	23242526 33 36 41
Myoporum debile	46
Myoporum floribunda	46
Myoporum insulare	28 32 35 373839 44 46
Myoporum laetum	9 18 23 2526 29 46 50
Myoporum parvifolium	
Myoporum serratum	24
Myoporum viscosum	24
Myrica cerifera	6 11 31 33
Myricaria floribunda	202122 24 2728293031 3435 3839 42 46
Myroxylon balsamum	6 50
Myrsine africanus	7 11
Myrsine urvillia	5 7 9 11
Myrtus communis	12356789 18 2021222324252627282930 31 33 35 373839 42 46
Nandina domestica	1 35 7 2021222324252627 29 3132333435363738394041424 3 464748
Napoleona imperialis	1 3
Nematanthus longipes	1 35
Neopanax arboreus	22 24252627 29 46
Neopanax colensoi	46
Nerium oleander	1 356789 11 18 2021222324252627282930313233343536373839404142 46 484950
Neviusia alabamensis	18 23 2526 29 35
Nicotiana glauca	3
Nolina longifolia	18
Noltea africanus	20 22 24
Nopalea cochenillifera	1 6
Nothofagus cliffortioides	46

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Nothofagus cunninghamii	1	5678					2728	31	343536			46
Nothofagus fusca								32	343536373839			46
Nothofagus menziesii												46
Nuytsia floribunda								33				
Nyssa sylvatica												46
Ochna atropurpurea					22		28	31	3435	37383940	4243	46
Odontonema schomburgkianum	5	7	11			24						
Olea africana		7										
Olea europaea	1	356	891011		14	18	212223242526		29	36	3839	4142	46
Olearia argophylla	1	5	789			20	22	24				
Olearia avicennifolia		7										
Olearia floribunda												50
Olearia frostii					20212223		2526	28	31			
Olearia rudis		8										
Olearia stellulata												46
Olearia teretifolia							27					46
Olearia tomentosus												46
Olearia traversii		7										
Omalanthus populifolius		67	11			2223	2526			35	40	42	46
Opuntia brasiliensis			11									
Opuntia ficus indica	1											
Opuntia imbricata			11									
Opuntia microdasys			11									
Opuntia tomentosa		3	11									
Opuntia tuna		3	11									
Opuntia vulgaris		3										
Oreocallis pinnata											40	
Orphium frutescens		8			20							
Osbeckia kewensis								31		37		
Osmanthus americanus	1	3	7	11								
Osmanthus delavayi									35			46
Osmanthus fragrans		7										46
Osmanthus heterophyllus		6789			18	212223242526		2829	33	3536		42	46	48

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Osmanthus Xfortunei	35
Osmunda regalis	6 20 22
Owenia venosa	5 7
Oxydendrum arboreum	33 46
Oxylobium alpestre	46
Oxylobium callistachys	22
Oxylobium ellipticum	46
Pachystachys coccinea	1 3 8 20 22 27
Paeonia lutea	31
Paeonia officinalis	1 7 21 24 46
Paeonia suffruticosa	1 35 78 11 202122 27 29 31 33 46
Paliurus spina-christi	1
Pandanus baptistii	20 24
Pandanus pedunculatus	7
Pandanus veitchii	6 23242526
Pandorea jasminoides	1 3567 9 11 18 20212223242526272829303133343550
Pandorea pandorana	5678 17 21222324 2728293031 333435 37 46
Parkinsonia aculeata	5
Parrotia persica	33 353637 40 42 46
Parthenocissus henryana	25262728293031 3334353637 46
Parthenocissus inserta	46
Parthenocissus quinquefolia	5679 18 21 232425262728293031 33 35 37 46
Parthenocissus tricuspidata	7 18 20212223242526272829303133343536374046
Passiflora alata	1 35 789 20
Passiflora alba	1 3
Passiflora antioquiensis	67 9 1718 20212223 2526 2829 31
Passiflora bahnii	20 22
Passiflora banksii	35 7
Passiflora caerulea	1 3567 9 11 18 202122232425262728293133 35 37 46
Passiflora cinnabarina	46
Passiflora coccinea	1
Passiflora edulis	1 3567891011 11a12141718 20212223242526272829303132333435363740 41 46
Passiflora foetida	1 3

	1850	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Passiflora herbertiana	1			18		24	2728					
Passiflora incarnata	1											
Passiflora jamesonii				18								
Passiflora manicata	1	356789	11	18	20212223242526272829			31	35	37	40	46
Passiflora misera					20 22							
Passiflora mixta		6		18	2021222324		2728					
Passiflora mollissima		3567 9	11	18	20212223242526272829303132333435363738						404142	46 50
Passiflora pinnatistima	1	35 7										
Passiflora quadrangularis		3 67			20 22							
Passiflora racemosa	1	35 7 9										
Passiflora raddiana	1	3			202122							
Passiflora serratifolia	1	3										
Passiflora trifasciata						24						
Passiflora Xbonaparta		9										
Passiflora Xdecaisneana		7										
Passiflora Xexoniensis		6		18	212223242526272829			31	35			
Passiflora Ximperaticeeug					20 222324		2829	31				
Passiflora Xloudoni	1				20 22							
Passiflora Xracemosa/caer	1	356										
Paulownia fortunei								31				
Paulownia tomentosa	1	356789		18	2021222324		2829	313233343536		38	42	4647
Pedilanthus tithymaloides	1											
Pentas lanceolata	1	35										
Pereskia aculeata		3										
Periploca graeca	1											
Peristrophe lanceolaria		6	11									
Pernettya mucronata					22			31	36		4142	44 46
Persea borbonia	1	35 8			202122							
Persoonia elliptica										40		
Persoonia longifolia										40		
Persoonia nutans								33				
Persoonia pinifolia												46
Persoonia saccata										40		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Petrea volubilis
Petrophila biloba
Petrophila biloba
Petrophila sessilis
Phebalium bilobum
Phebalium ozothamnoides
Phebalium squamulosum
Philadelphus bannieri
Philadelphus coronarius
Philadelphus delavayi
Philadelphus inodorus
Philadelphus lewisii
Philadelphus mexicanus
Philadelphus microphyllus
Philadelphus pubescens
Philadelphus Xburkwoodii
Philadelphus Xcymosus
Philadelphus Xlemoinei
Philadelphus Xpurpureomaculatus
Philadelphus Xvirginalis
Phillyrea angustifolia
Phillyrea decora
Philodendron cordatum
Phlogacanthus asperulus
Phoenix acaulis
Phoenix canariensis
Phoenix dactylifera
Phoenix paludosa
Phoenix pusilla
Phoenix reclinata
Phoenix roebelenii
Phoenix rupicola
Phoenix sylvestris

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Phormium colensoi	67 9 11 22
Phormium tenax	1 3567 9 11 14 18 21222324252627 29 33 36 474849
Photinia glabra	333435363738394041424344 47484950
Photinia serrulata	356789 11 1214 18 212223242526272829 31 3334 3839 46
Photinia villosa	42 46
Phygelius capensis	567 11a 21 23 2526 29 33 353637 46
Phyllocladus asplenifoliu	1 3 7 46
Phyllocladus trichomanoid	1 33 46
Phyllostachys bambusoides	31
Phyllostachys nigra	1 35 7 11 18 2223 2526272829 31
Phyllostachys quiloil	2526
Physalis peruviana	21
Physocarpus opulifolius	20 22 31 33 35 46
Picea abies	1 56789 11 1718 2021 2526 2829 323334 36 3839 42 46
Picea engelmannii	46
Picea glauca	1 67 9 12 17 2021 24 3334 36 46
Picea mariana	2021 2526 33
Picea morinda	1 32 34
Picea omorika	34 46
Picea orientalis	21 46
Picea pungens	33343536 38394041 44 46 49
Picea rubens	7 36
Picea sitchensis	20 24 33 46
Picea smithiana	67 9 11 18 2526 34 46
Pieris floribunda	31 36
Pieris forrestii	46 48
Pieris japonica	272829 313233343536373839 41 46
Pimelea ferruginea	56789 18 23242526 46 4950
Pimelea rosea	5
Pimelea spectabilis	33 40 43
Pinus attenuata	67 9 11 1718 21 2324 33
Pinus canariensis	1 56789 11 12 1718 2021 242526 2829 3233 353637 46
Pinus cembroides	1

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Pinus contorta	7 11 17 21 33
Pinus coulteri	1 5678 11 12 18 21 2324 33
Pinus densiflorus	9
Pinus gerardiana	1 3 7
Pinus halepensis	1 356789 11 12 1718 2021 242526 2829 313233 35 46
Pinus jeffreyi	6 9 1718 21 33
Pinus lambertiana	17 21 33
Pinus massoniana	2526
Pinus maximinoi	1
Pinus montezumae	1
Pinus monticola	7 21 33
Pinus mugo	3567 9 12 1718 2021 242526 2829 33 46
Pinus muricata	1 5 7 9 12 17 21 33
Pinus nigra	56789 12 1718 2021 242526 33
Pinus palustris	1 33 46
Pinus patula	46
Pinus peuce	7 46
Pinus pinaster	1 356789 11 12 1718 2021 242526 2829 31 33 46
Pinus pinea	1 356789 11 12 1718 20 242526 29 3233 36 46
Pinus ponderosa	567 9 11 12 1718 2021 242526 3233 36
Pinus pseudostrobus	1 7
Pinus pungens	1
Pinus radiata	56789 11 12 1718 2021 24252627282930313233343536 383940 42 46
Pinus resinosa	33
Pinus rigida	21 33
Pinus roxburghii	1 3 67 9 11 33
Pinus sabiniana	1 6789 12 17 21 33
Pinus strobus	56789 11 12 1718 2021 242526 29 33
Pinus sylvestris	35 789 11 17 21 33 36
Pinus taeda	1 46
Pinus teocote	1
Pinus torreyana	9 11 12 1718 21 33
Pinus wallichiana	1 3 6789 11 18 2021 242526 33

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Pisonia umbellifera	18 23242526 29 37 4142 46
Pistacia chinensis	
Pistacia lentiscus	1
Pistacia terebinthus	20 22
Pittosporum bicolor	18 46
Pittosporum crassifolium	67 9 11 12 1718 23 2526272829 31 33343536373839404142 44 46 49
Pittosporum eugenioides	1 356789 11 12 1718 20212223242526272829303132333435363738394041424344 46 484950
Pittosporum phillyraeoides	35 40 46
Pittosporum ralphii	33
Pittosporum revolutum	1 3 789 12 46
Pittosporum rhombifolium	3132 36 46
Pittosporum rigidum	11 17
Pittosporum rubiginosum	5 9
Pittosporum tenuifolium	1 3567 9 1112 18 202122232425262728293435363738394041424344 46474849
Pittosporum tobira	1 356789 11 18 212223 2526272829 3132 35
Pittosporum undulatum	1 356789 11 12 1718 20212223242526272829303132333435363738394041424344 46 50
Planchonella australis	7
Platanus occidentalis	56 36
Platanus orientalis	1 5678 202122 2829 313233343536373839404647
Platanus Xacerifolia	9 11 18 23 252627
Platycladus orientalis	1 356789 11 17 2021 24 28 3233343536 3839 41 46
Plectranthus ciliatus	46
Plectranthus ecklonii	6 18 23 2526272829 31 333435 37 46
Plectranthus fruticosus	46
Plumbago auriculata	1 356789 11 18 212223 25262728293031 333435 37 40 46 50
Plumbago indica	1 35 8
Plumbago zeylanica	35 789 23 25
Plumeria rubra	35 46
Podalyria calyptrata	1 3 89 18 212223 2526 28293031 333435363738394041 43 46 484950
Podalyria sericea	1 89 2122 27 29 33 363738 46 49
Podocarpus andinus	7 20 46
Podocarpus dacrydioides	1
Podocarpus elatus	46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Podocarpus elongatus	7 20
Podocarpus ferrugineus	7
Podocarpus macrophyllus	35 7 9
Podocarpus neriifolius	1 11
Podocarpus spinulosa	56789 18 20 242526 2829
Podocarpus totara	5 789 18 20 242526 2829 46
Podocarpus totara	35 789 18 20 242526 2829 46
Podranea ricasoliana	6 18 202122 24252627282930313233343536 37 40 46 49
Polygala chamaebuxus	35 7 9 28 31 33
Polygala myrtifolia	1 356789 22 27 31 35 37
Polygala oppositifolia	1 3 89 35
Polygala virgata	1 35 78
Polygala Xdalmaisiana	46
Polygala Xpalmas	6 18 2122 242526 29 3839 43 484950
Polygonum baldschuanicum	27 29 31 33 35 37 46
Polyosma cunninghamiana	1
Polypodium aureum	32
Polypodium billardierii	20 22
Polypodium punctatum	6
Polyscias guilfoylei	20 22
Polystichum triangulare	20 22
Pomaderris elliptica	27 46
Pomaderris ferruginea	46
Pomaderris lanigera	46
Pomaderris phylicifolia	7 11
Populus alba	567 9 18 202122 242526272829 313233343536373839 40 42 4647
Populus angulata	3536
Populus balsamifera	5 7 32 35 46
Populus deltoides	31 34353637 42 44 4647
Populus lasiocarpa	46
Populus nigra	1 3567 9 18 202122 242526272829 313233343536373839404142 44 4647
Populus simonii	35 37 4647
Populus tremula	67 9 33 3536 3839 4647

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Populus Xcanadensis	5 7 272829 313233 40 44 46
Populus yunnensis	33343536 42 44 4647
Portulacaria afra	46
Potentilla fruticosa	35 46
Prestonia venosa	1 3
Prostanthera cuneata	42 46
Prostanthera denticulata	46
Prostanthera incana	46
Prostanthera incisa	33 35 37383940 42 46
Prostanthera lasianthos	3 27 3031 33 3536 40
Prostanthera melissifolia	31 35 37 46
Prostanthera nivea	3 2122 2728 35 46
Prostanthera ovalifolia	31 353637383940 4243 46 48 50
Prostanthera rotundifolia	67 18 2122 242526 28293031 333435363738 41 43 46 50
Prostanthera sieberi	2122 2526272829 3132333435363738 4041
Prostanthera spinosa	2122
Prostanthera stricta	46
Prostanthera violacea	36 46
Protea barbigera	46
Protea compacta	46
Protea cynaroides	33 35 3839 41 46
Protea grandiceps	35 46
Protea laurifolia	46
Protea lepidocarpodendron	46
Protea longifolia	33 46
Protea mellifera	1 56789 11 12 1718 2122 252627282930 333435 38394041 46 49
Protea mundi	31
Protea nana	1 31 46
Protea neriifolia	46
Protea obtusifolia	31
Protea speciosa	35 41 46
Protea susannae	31 33 4041
Prunus armeniaca	123 67891011 14 1819 222324 2627 29 3132 3536 4142 4546 49

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Prunus avium	123567891011 14 1819 222324252627 29 3132 3536 4142 45 47 49
Prunus campanulata	4647 49
Prunus cerasifera	35 7 1011 14 1819202122232425262728293031323334353637383940414245 4647 49
Prunus cerasus	1 7 33
Prunus domestica	1 35 7891011 14 1819 21 2324 2627 29 3132 3536 4142 45 47 49
Prunus dulcis	1235 7891011 14 1819 222324 2627 29 3132 3536 41 45 49
Prunus glandulosa	567 9 11 18 202122 24252627282930313233343537383940414245 4647 49
Prunus ilicifolia	1 22
Prunus incisa	46
Prunus insititia	9 36
Prunus japonica	6 202122 36 42 49
Prunus laurocerasus	1 356 89 11 18 212223242526272829 313233 3536 41 46
Prunus lusitanica	12356 89 11 18 212223242526 2829 31 3334353637 41 44 46 48
Prunus mahaleb	6 10
Prunus mume	2829 31 333435363738394041 42 454647 49
Prunus nigra	49
Prunus persica	123567891011 14 1819202122232425262728293031323334353637383940414245 47 49
Prunus sargentii	46
Prunus serrulata	2324 29 31 333435 37383940 42 454647 49
Prunus spinosa	3 3132 3536 383940 42 4546
Prunus subhirtella	19 36 46 49
Prunus tenella	46
Prunus triloba	20 22 24 272829 3132 34353637 40 42 4546 49
Prunus Xblireiana	2728 303132 343536373839404142 454647 49
Prunus Xpollardii	2829 31 3435 37383940 42 454647 49
Pseuderanthemum bicolor	1 3
Pseuderanthemum tuberculatum	7
Pseuderanthemum variable	7
Pseudopanax crassifolium	7 3536 46
Pseudopanax ferox	46
Pseudopanax lessonii	46
Pseudotsuga menziesii	56789 11 12 1718 2021 242526 282930 3233343536 3839 42 44 4647
Psidium guajava	1 3 891011 1417 2526 2930 36 42

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Psidium littorale	1 3567891011 18 2122 2425262728293031323334353637383940 4243 48
Psoralea aphylia	1 5 35
Psoralea pinnata	34 37383940414243 46 4950
Pterostyrax hispidus	46
Pultenaea daphnoides	3 46
Pultenaea pedunculata	49
Punica granatum	1 3567891011 14 18 20212223242526272829 313233343536373839404142 43 46 49
Pyracantha angustifolia	29 31 3334353637383940 42 46
Pyracantha coccinea	1 5678 18 20 22232425262728 313233 35363738 42 46
Pyracantha crenulata	18 20212223 252627282930313233343536 37 40 42 46
Pyracantha fortuneana	31 353637 39 46
Pyracantha rogersiana	31 333435
Pyrostegia venusta	1 3 67 9 18 20 23242526 28293031 33 353637 40
Pyrus communis	1235 7891011 14171819 21 2324 26 29 31 33 35 4142 45
Pyrus pashia	46
Pyrus salicifolia	46
Pyrus ussuriensis	46
Quercus agrifolia	1
Quercus alba	7 18 36
Quercus bicolor	1 32 36
Quercus canariensis	46
Quercus cerris	1 7 202122 272829 31 333435 46
Quercus coccinea	1 7 202122 282930 323334 36 40 44 46
Quercus dentata	36 46
Quercus falcata	1
Quercus ilex	1 3 67 18 2122 24 31 33 46
Quercus leucotricophora	1
Quercus lusitanica	18 2122 2425262728 313233343536 41 44
Quercus macrocarpa	7 32 36
Quercus macrolepis	1
Quercus marilandica	1
Quercus muehlenbergii	7 36 42
Quercus palustris	1 31 333435363738394041 42 44 4647

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Quercus petraea	1 3
Quercus prinus	1
Quercus reticulata	1
Quercus robur	1235678 18 202122 242526272829 31 33 353637 41 46
Quercus rubra	67 31 33 36 46
Quercus suber	1 7 2526272829
Quercus velutina	1
Quercus virginiana	1 7 18 27
Quisqualis indica	1 3 2223 33
Randia malleifera	1 3
Rapanea variabilis	23
Raphiolepis indica	1 5678 18 2122 24 27 383940 46
Raphiolepis umbellata	67 11 18 2122 2425262728293031 3334353637383940 46
Raphiolepis Xdelacourii	37 43 46 484950
Reinwardtia Indica	1 3 7 3536
Rhagodia hastata	27 31 33
Rhamnus alaternus	1 3 678 18 2122 242526 29 31 33 35363738 46
Rhapis excelsa	6 202122232425262728 31
Rhodochiton atrosanguineu	21
Rhodotypos scandens	20 22
Rhopalostylis baueri	6 20212223242526
Rhopalostylis sapida	567 9 11 2021222324
Rhus chinensis	202122
Rhus coriaria	56
Rhus glabra	5 7 20 22 36
Rhus lucida	1
Rhus radicans	5 78
Rhus succedanea	5 18 202122 252627282930313233343536373839404142 46
Rhus toxicodendron	333435 37
Rhus typhina	67 202122 2728293031
Rhus verniciflua	3 18 36
Ribes alpinum	31
Ribes aureum	123567 91011 14 18 202122 24 272829 31 35 41 46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Ribes menziesii	27 29 31 33
Ribes nigrum	23 7 91011 14 18 222324 2627 29 35 3839 4142 49
Ribes sanguineum	1 35678 11 2021222324252627282930313233343536373839404142 44 4647
Ribes sativum	2 7 91011 18 2223 2627 29 31 35 3839
Ribes speciosum	1 35678 11 18 222324252627 29 31 35 3839 4142 49
Ribes uva-crispa	235 7891011 14 18 2223 262729 3132 3536 3839 4142 49
Ribes Xgordonianum	27 31 33 35
Ricinocarpos pinifolius	46
Ricinus communis	18 2122 2425262728 40 46
Rivina humilis	5 11
Robinia hispida	1 35678 11 20 22 28293031 36
Robinia kelseyi	313233343536373839
Robinia pseudoacacia	1 356789 11 202122 28 31323334 36 46
Robinia Xambigua	32 36
Romneya coulteri	2122 242526 2829 31 33 46
Rondeletia amoena	22 252627 293031 35 37 46
Rondeletia anomala	5678 18 353637 43 46
Rondeletia odorata	1 35 78 11
Rosmarinus lavandulaceus	46
Rosmarinus officinalis	3 67 9 1111a12141718 21 242526 2829 31 343536 383940 42 4647 4950
Rothmannia globosa	5678 18 2021222324252627 46
Rothmannia longifolia	1 3
Royena lucida	6 22 2526 29 33 36 46
Royena villosa	1
Rubus fruticosus	35 7891011 14 18 20 24 32 36
Rubus idaeus	12356789 11 14 18 20 222324 26 29 3132 3536 3839 4142 45 49
Rubus laciniatus	10
Rubus phoenicolasius	18 2324 26 32 36
Rubus rosifolius	7
Rubus ursinus	2324 26 3132 3536 3839 4142 45 49
Rudbeckia laciniata	21 2425 29 333435
Ruellia elegans	1 3 7
Rulingia parvifolia	22

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Ruscus aculeatus	78 2526 29 42
Russelia equisetiformis	1 35 7 11 2223 252627 46
Russelia sarmentosa	3
Ruta graveolens	35 7 1111a121417 23 26
Sabal blackburniana	6 2021222324
Sabal minor	6 202122
Sabal palmetto	67 9 20212223
Salix alba	567 9 202122 27282930313233343536373839 40 42 44 46
Salix babylonica	1 3567 9 18 202122 242526272829 31323334353637383940 41424344 4647
Salix caprea	5 7 9 2728 46
Salix chilensis	5
Salix fragilis	1 6
Salix matsudana	46
Salix nigra	46
Salix phylicifolia	5 7 36
Salix purpurea	5 36
Salix triandra	46
Salix viminalis	1 5 7
Salix Xmultinervis	31 35
Salix Xrubra	6 9 202122 27282930313233343536 37 47
Salvia aurea	35 7 46
Salvia azurea	5 7 9 14 2122 2425 27 31 333435
Salvia coccinea	35 7 9 11 12 17 22
Salvia elegans	18 2122 2526272829 46
Salvia fulgens	22 2526
Salvia grahami	2122 2526272829 31 34
Salvia heeri	2526
Salvia ianthina	2122 252627
Salvia involucrata	6 18 2122 252627 29 31 3435 46
Salvia leucantha	2 5 7 9 14 2425 29 31 35 46
Salvia officinalis	3 7 9 1111a12141718 21 2324 26 29 31 35
Salvia splendens	1 3567 9 11 1214171819 2122 252627 3435
Salvia Xbonfire	202122 2526272829 33 40

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Sambucus nigra	1 356789 11 18 202122 242526272829 31 46
Sambucus racemosa	27
Santolina chamaecyparissus	35 37 46
Santolina neapolitana	35
Sapindus marginatus	1
Sapindus saponaria	7
Sapium sebiferum	1 7 46
Sarcococca ruscifolia	46
Saxegothaea conspicua	1
Scaevola albida	49
Scaevola calendulacea	33
Scaevola macrocarpa	46
Scaevola ramosissima	46
Schinus molle	1 6 9 1718 2122 24252627 30313233 353637383940 44 46 50
Schinus polygamus	1 18 23 2526
Schinus terebinthifolia	1 78 36
Schizophagma hydrangeoides	24
Schotia afra	1
Schotia brachypetala	46
Schotia latifolia	1 35 22
Sciadopitys verticillata	7 24 36 46
Selenicereus grandiflorus	1 11
Selenicereus macdonaldiae	3
Selenicereus pteranthus	20
Senecio ficoides	6 20
Senecio macroglossus	46
Senecio petasitis	46
Sequoia sempervirens	1 3567 9 11 12 17 21 2526 313233 44 46
Sequoiadendron giganteum	356789 11 12 1718 2021 242526 31 33343536 3839 46 49
Serissa foetida	7 9 18 242526 46 48 50
Serruria florida	46
Sesbania grandiflora	1
Sesbania punicea	35 8

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Sesbania tripetii	33 36 38 40 46
Shepherdia argentea	1
Sibiraea laevigata	1 3
Skimmia japonica	3233 46
Smilax glauca	1 7
Smilax laurifolia	202122
Solandra grandiflora	3 7 20212223242526 29 333435 37 40
Solandra guttata	46
Solandra maxima	35 37 40 42
Solanum capsicastrum	18 2122 2526 33 36
Solanum erianthum	46
Solanum hendersonii	35
Solanum jasminoides	1 356789 11 18 2021222324252627282931 33 35 37 46
Solanum pseudo-capsicum	3
Solanum rantonnetii	46
Solanum seaforthianum	252627 29
Solanum violaceum	2122
Solanum wendlandii	20 2526 29 333435 42
Sollya heterophylla	3 6 89 11 18 212223242526 35 40 42 46 484950
Sophora japonica	1 67 18 202122 24 31 35 46
Sophora microphylla	2324252627 46
Sophora tetraptera	1 3 67 9 18 20 22 28 3031 333435363738394041424346 49
Sorbaria grandiflora	6 9 20 2223 252627 30 3334
Sorbaria sorbifolia	6789 20 2223 2526 46
Sorbus americana	33 35 46
Sorbus aria	35 46
Sorbus aucuparia	1 567 11 20 22 2425262728293031323334353637383940414243 4647 49
Sorbus cuspidata	3132 36
Sorbus discolor	31 35 46
Sorbus domestica	46
Sorbus hupehensis	42 46
Sorbus sambucifolia	36 4142
Sorbus vilmorinii	33 46

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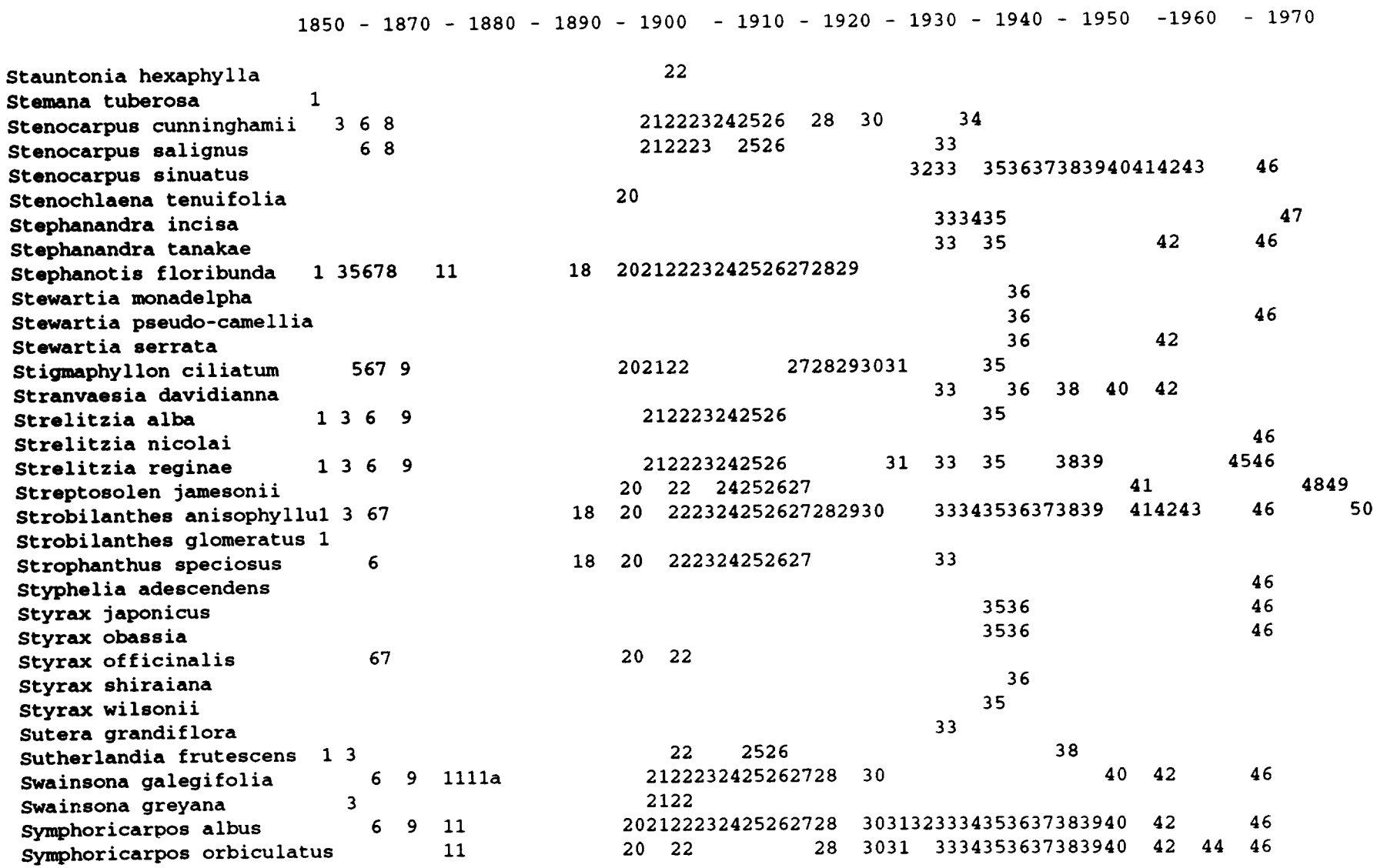
Sparmannia africana	1 67 18 2122 2425262728 3031 35 46
Spartium junceum	5 11 18 20 22232425262728 3031323334353637383940 4243 46 4950
Sphaeropteris cooperi	20 22
Sphaeropteris medullaris	6 22
Spiraea alba	46
Spiraea bella	3567 9 23 2526
Spiraea blumei	5 46
Spiraea canescens	3
Spiraea cantoniensis	567 9 20 2223 252627 30 3334 3637383940 43 4647
Spiraea chamaedryfolia	67 20 22
Spiraea corymbosa	1 35 7
Spiraea densiflora	3567 9 20 22
Spiraea douglasii	1 20 2223 25262728 31
Spiraea gracilis	20 22 36 43
Spiraea hypericifolia	1 35 789 20 2223 2526
Spiraea japonica	67 9 20212223242526 29 36
Spiraea prunifolia	1 356789 20 2223 2526 3233 37 46
Spiraea salicifolia	6 20 22
Spiraea thunbergii	7 28 31 34353637383940 46
Spiraea tomentosa	1
Spiraea wilsonii	31
Spiraea Xbilliardii	36
Spiraea Xbumalda	20 2223 25262728 3031 333435363738394041424 3 4647
Spiraea Xmargaritae	36 4142
Spiraea Xmultiflora	31 35 37
Spiraea Xsanssouciana	20 22
Spiraea Xvanhouttei	32 36
Sprengelia incarnata	46
Spyridium parvifolium	46
Spyridium vexilliferum	46
Stachytarpheta mutabilis	1
Stachyurus praecox	46
Staphylea colchica	20212223 2526 31


1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Stauntonia hexaphylla
Stemana tuberosa
Stenocarpus cunninghamii
Stenocarpus salignus
Stenocarpus sinuatus
Stenochlaena tenuifolia
Stephanandra incisa
Stephanandra tanakae
Stephanotis floribunda
Stewartia monadelpha
Stewartia pseudo-camellia
Stewartia serrata
Stigmaphyllon ciliatum
Stranvaesia davidianna
Strelitzia alba
Strelitzia nicolai
Strelitzia reginae
Streptosolen jamesonii
Strobilanthes anisophyllu
Strobilanthes glomeratus
Strophanthus speciosus
Styphelia adescendens
Styrax japonicus
Styrax obassia
Styrax officinalis
Styrax shiraiana
Styrax wilsonii
Sutera grandiflora
Sutherlandia frutescens
Swainsona galegifolia
Swainsona greyana
Symphoricarpos albus
Symphoricarpos orbiculatus

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Syncarpia glomulifera	2122 28 33 3536 40
Synoum glandulosum	1
Syringa josikaea	6
Syringa reticulata	6 9 18 23 2526
Syringa villosa	35 46
Syringa vulgaris	12356 9 11 18 20 22232425262728 313233343536 4142 454647 49
Syringa wolfii	33 3536 38 41 4546
Syringa Xhyacinthiflora	18 20 2223 25262728
Syringa Xpersica	1 3 6 89 11 18 202122232425262728 31 33343536 38 42
Syzygium coolminianum	22 33 36 3839 4142 46
Syzygium floribundum	202122232425262728 29
Syzygium jambos	3 18 23
Syzygium luehmannii	42 46
Syzygium malaccense	1 7
Syzygium paniculatum	567891011 202122 2425262728 3031 3334353637383940 46
Tabebuia rosea	6 202122 31 35 37
Tabernaemontana dichotoma	1 3 8
Tamarindus indica	1 7
Tamarix africana	32 36
Tamarix aphylla	37 40
Tamarix chinensis	5 20 22 28 3031 3435 37 4647
Tamarix gallica	56 9 11 18 202122232425262728 3031 33 35 37 40 42
Tamarix hispida	28 46 50
Tamarix parviflora	
Tamarix ramosissima	303132 3435 373839 43 46
Tamarix tetrandra	3132 353637 41
Taxodium distichum	1 3 67 9 2526 313233343536 404142 46
Taxodium mucronatum	1 3
Taxus baccata	1235678 11 18 20 242526 28 30 3233 36 3839 41 46
Taxus cuspidata	36
Tecoma alata	202122232425262728 3031 33 353637 46
Tecoma fulva	23
Tecoma garrocha	18

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Tecoma stans	1 356 9 1718 202122232425262728 46
Tecomaria capensis	1 356789 11 18 202122232425262728 3031 3334353637 40 46
Telopea oreades	3132 363738 42 46
Telopea speciosissima	1 3 12 17 21 31 33 35363738 404142 46 48
Telopea truncata	33 46
Templetonia glauca	1 7
Templetonia retusa	6 9 18 2223 33 40 46
Tetraclinis articulata	17
Tetrapanax papyrifera	56789 11 18 20212223242526272829 46
Tetratheca ciliata	20 22 46
Teucrium betonicum	46
Teucrium fruticans	35 373839 46 48 50
Teucrium marum	35 46
Thomasia macrocarpa	50
Thomasia petalocalyx	46
Thomasia purpurea	20 22
Thryptomene baeckeacea	46
Thryptomene calycina	6 20 2223 25262728 3031 38394041 46 50
Thryptomene saxicola	40
Thryptomene Xpaynee	46 48 50
Thuja occidentalis	12 56789 11 20 28 31 343536373839 4142 464748
Thuja plicata	56789 11 1718 20 242526 28 31 3435 37 44 464748
Thuja standishii	18 2526
Thujopsis dolabrata	67 9 11 18 20 242526 3031323334 36 3839 4142 44 46
Thunbergia alata	1 3 1111a12 17 46 49
Thunbergia coccinea	1 3 6
Thunbergia erecta	5 8 24
Thunbergia fragrans	1 3 7 11
Thunbergia grandiflora	3
Thunbergia gregorii	29 31 353637 41 46
Thunbergia hawtayneana	2122 25
Thunbergia laurifolia	56 18 23242526
Thunbergia vogeliana	7

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Thymus herba-barona	35
Thymus richardii	28
Thymus serpyllum	28 35 49
Thymus vulgaris	3 7 9 11a12141718 21 2324 26 2829 31 35
Thymus Xcitriodorus	3 9 141718 20212223242526 2829 31 35
Tibouchina granulosa	11 18 23 36
Tibouchina heteromalla	1 3 7
Tibouchina laxa	6 11 18 46
Tibouchina urvilleana	6 9 11 18 202122232425262728 3031 3334353637383940414243 46 484950
Tieghemopanax elegans	28
Tieghemopanax multifidus	46
Tilia cordata	46
Tilia platyphyllos	32 36 4142 46
Tilia tomentosa	46
Tilia Xeuropaea	1 3 6789 11 18 20122223242526 3132 343536 3839 41 46
Todea barbara	6
Toona australis	33
Torreya californica	12 17
Trachelospermum jasminoi.	1 3 6789 11 18 20212223242526272829 31 3334 46 50
Trachycarpus fortunei	6 9 20212223242526
Trichocereus chiloensis	1
Triplochlamys multiflora	24
Tristania conferta	3 789 11 2021222324252627 303132333435363738394041424344 46 48 50
Tristania laurina	6 3233 40 46 484950
Tristania neriifolia	12 46
Tsuga canadensis	34
Tsuga dumosa	1
Tsuga heterophylla	36
Tsuga yunnanensis	46
Turnera ulmifolia	1 3
Tweedia coerulea	1 3 33
Ugni molinae	567891011 18 21222324252627 29 313233343536373839 42 46
Ulex europaeus	5 12 17

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Ulmus americana	11 35
Ulmus canescens	67 18
Ulmus carpinifolia	6 18 202122 24252627 32 36
Ulmus crassifolia	46
Ulmus glabra	1 67 11 20212223 2526 3132 36 46
Ulmus parvifolia	1 35 7 9 2526 31 3536373839 4142 46
Ulmus procera	12 56789 11 18 2021222324252627 313233343536 3839 4142 454647 49
Ulmus pumila	37
Ulmus Xhollandica	1 5 7 9 11 18 20 222324252627
Ulmus Xvegeta	6 20212223242526 313233 353637
Vaccinium corymbosum	33 36 40 42 46
Veronica formosa	31
Verticordia brownii	35 9 23 2526
Verticordia densiflora	33 40
Verticordia picta	33 40
Verticordia plumosa	46
Viburnum acerifolium	35
Viburnum alnifolium	38
Viburnum bitchiuense	313233 3536
Viburnum carlcephalum	42 46
Viburnum carlesii	2728 3132333435363738394042 4647 49
Viburnum farreri	31 33 3536 42 46
Viburnum japonicum	1 356789 11 18 20212223 2526 36 42 46
Viburnum lantana	31 3536 42
Viburnum macrocephalum	1 3 3132 36 46
Viburnum nudum	36
Viburnum obovatum	1 31
Viburnum odoratissimum	1 356789 18 20212223242526 3536 46
Viburnum opulus	1 356789 11 18 202122232425262728 303132333435363738394041424 464748
Viburnum plicatum	1 3 23 2728 3132 34353637383940 4243 4647
Viburnum prunifolium	31
Viburnum rhytidophyllum	27 303132 353637 41 46
Viburnum rigidum	1 3567 20

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Viburnum sargentii	33 36 42
Viburnum sieboldii	6 18 20212223242526272831
Viburnum suspensum	56789 11 18 20 2223 33 35
Viburnum tinus	12356789 11 18 202122232425262728 3031 33343536373839404243 46 484950
Viburnum utile	33
Viburnum wrightii	3536
Viburnum Xburkwoodii	353637383940414243 46 4849
Viburnum Xjuddii	41
Vigna caracalla	6 1718 20212223242526272829 31 333435 404142 4647
Viminaria juncea	46
Vinca major	1 35 789 11 14 18 2122 24 46
Vinca minor	1 35 78 11 141718 23 2526
Virgilia capensis	1 6 18 23242526 29303132333435363738394041 4344 46 48
Virgilia divaricata	42 44 4849
Vitex agnus-castus	1 567 20 22 35 37 42 46
Vitex trifolia	35
Vitis amurensis	29 31 33 353637 404142 46
Vitis coignetiae	33 36 42 46
Vitis labrusca	1
Vitis vinifera	1 35 7891011 1418 19 222324 2627 29 32 36 4142 49
Vitis vulpina	1
Washingtonia filifera	2021222324252627 33
Washingtonia robusta	24 2728 31
Weigela coraeensis	67 9 18 20 2223 2728 31 353637 41
Weigela floribunda	9 18 2223 2526 28 31 33 36 3839 41
Weigela florida	1 356789 18 20 23 2526272829 31 333435363738394041424344 4647484950
Weigela hortensis	6 18 23 2526
Weigela middendorffiana	67 9 18 23
Weigela praecox	31 353637 4142 46
Weigela Xnewport red	4142
Weigela Xstelzneri	41
Weigela Xstyriaca	27 31 353637 41 46
Weigela Xwagneri	23

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Weinmannia racemosa	46
Westringia fruticosa	46 50
Westringia glabra	28 31 46 4950
Westringia rosmariniformis	3 67 11 20 22 272829 31 33 35
Westringia xwynyabbie gem	
Widdringtonia cupressoide	6789 18 20 2526
Widdringtonia juniperoide	1 3 7 9
Wigandia caracasana	6 10 18 2021222324252627 29
Wigandia urens	18 23 2526
Wisteria brachybotrys	32
Wisteria floribunda	202122 2425262728293031323334353637 41 4647
Wisteria frutescens	356 202122
Wisteria macrostachya	
Wisteria megasperma	6 18 22 46
Wisteria sinensis	1 3567 9 11 18 202122232425262728293031323334353637 404142 46 49
Woodwardia orientalis	6 20 22
Woodwardia radicans	6 20 22
Xanthoceras sorbifolium	32 36
Xanthorrhoea australis	5
XCrataego-mespilus gran.	1
Xeromphis spinosa	3
XFatshedera lizei	46
XHelioporus smithii	1
Yucca aloifolia	1 356 89 18 20 2223 252627
Yucca elephantipes	23
Yucca filamentosa	1 356 89 18 20 2223 252627 33 49
Yucca flaccida	6
Yucca glauca	6 18
Yucca gloriosa	1 356 89 18 23 2526
Yucca recurvifolia	6 9 18 20 2223
Yucca whipplei	6 18
Zenobia pulverulenta	31 33 35 46
Zieria smithii	6 46

	1850 - 1870 - 1880 - 1890 - 1900 - 1910 - 1920 - 1930 - 1940 - 1950 -1960 - 1970
Ziziphus paliurus	1

Appendix 4: Canberra's Planting Record (See chapter 2.6)

	Relative Number Planted	Period introduced
Abelia chinensis	185	2
A. floribunda	51	6
A. x grandifolia	10401	7
A. schumannii	1336	6
A. uniflora	553	2
Abelmoschus manihot	10	1
Abies alba	98	2
A. amabilis	30	2
A. balsamea	13	3
A. cephalonica	10	2
A. concolor	213	5
A. jezoensis	10	3
A. nordmanniana	93	2
A. pindrow	13	2
A. pinsapo	30	2
A. spectabilis	10	2
Abutilon XboutedeNiege	20	3
A. darwinii tesselatum	20	3
A. golden fleece	10	4
A. hybridum	20	3
A. megapotamicum	148	3
A. pictum	30	2
A. Xsouvenir de bonn	10	4
A. vitifolium	10	2
Acacia acinacea	123	8
A. aculeatissima	10	8
A. adunca	35	5
A. amblygona	10	8
A. aneura	4	5
A. baileyana	102454	4
A. betchei	436	8
A. boormanii	16764	8
A. calamifolia	16	6
A. cardiophylla	2908	8
A. cognata	80	8
A. conferta	30	4
A. cultriformis	18027	3
A. cyanophylla	60	4
A. decora	2580	5
A. decurrens	47670	4
A. drummondii	141	7
A. falcata	20	5
A. farnesiana	30	1
A. fimbriata	250	8
A. flexifolia	54	7
A. floribunda	12167	7
A. genistifolia	460	8
A. gladiiformis	16	6
A. glaucescens	7	5
A. gracilifolia	26	8
A. gunnii	100	8
A. howittii	2274	8
A. iteaphylla	5029	8

	Relative Number Planted	Period introduced
A. jonesii	30	5
A. leprosa	50	5
A. linifolia	30	2
A. longifolia	9878	5
A. myrtifolia	30	8
A. nigricans	10	8
A. omalophylla	9	6
A. panniculata	10	1
A. pendula	119	1
A. plicata	2	8
A. podalyriifolia	391	6
A. prominens	208	5
A. pulchella	20	8
A. retinodes	50	4
A. riceana	10	8
A. rotundifolia	15	8
A. saligna	73	4
A. spectabilis	1625	4
A. suaveolens	405	1
A. suberosa	34	8
A. sublanata	75	8
A. terminalis	564	4
A. triptera	884	8
A. vestita	7051	2
A. williamsonii	40	8
Acalypha wilkesiana	3	3
Acanthopanax sieboldianus	10	3
Acer argutum	80	8
A. buergeranum	757	8
A. campestre	90	4
A. cappadocicum	153	5
A. davidii	132	8
A. diabolicum	6	5
A. ginnala	13	6
A. grosseri	66	8
A. hookeri	26	8
A. japonicum	403	4
A. monspessulanum	75	8
A. negundo	5967	1
A. palmatum	3516	4
A. platanoides	1052	1
A. pseudoplatanus	1596	1
A. rubrum	661	5
A. rufinerve	3	7
A. saccharinum	238	1
A. saccharum	237	4
A. tataricum	10212	6
A. tegmentosum	5	7
Acmena smithii	41	1
Actinidia chinensis	1796	6
Aegle marmelos	20	2
Aesculus Xcarnea	226	1
A. hippocastanum	1098	1
Agapetes serpens	117	8
Agathis australis	20	1
A. moorei	10	2
A. ovata	10	3

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
A. robusta	10	3
Agave americana	40	1
Agave attenuata	10	4
Agastachys odorata	6	6
Aglaonema modestum	20	3
Agonis flexuosa	185	8
A. juniperina	265	7
A. linearifolia	30	8
Ailanthus altissima	327	1
Akebia quinata	541	4
A. trifoliata	52	8
Albizia distachya	142	1
A. julibrissin	3844	3
A. procera	30	3
Alectryon excelsus	10	3
Aleurites moluccana	10	3
Allamanda cathartica	20	2
A. neriifolia	10	3
A. violacea	10	3
Alnus cordata	156	7
A. glutinosa	864	3
A. jorullensis	720	7
A. nitida	6	8
A. viridis	15	8
Aloe succotrina	10	2
Aloysia triphylla	248	1
Alphitonia excelsa	20	2
Alsophila australis	10	3
A. leichhardtiana	10	3
A. tricolor	30	3
Alstonia scholaris	10	1
Alyogyne huegelii	28	6
Amelanchier canadensis	171	2
A. sanguinea	1	8
Amomyrtus luma	35	8
Amorpha fruticosa	10	1
Ampelopsis brevipendunculata	326	6
Anemopaegma chamberlaynii	20	2
Angophora bakeri	10	8
A. cordifolia	10	1
A. costata	228	8
A. floribunda	136	8
A. subvelutina	10	3
Annona cherimola	20	1
A. glabra	10	1
Anopterus glandulosus	6	8
Antigonon leptopus	30	3
Aphelandra aurantiaca	10	3
A. squarrosa	120	3
Aralia spinosa	13	4
Araucaria angustifolia	120	1
A. araucana	131	2
A. bidwillii	151	1
A. columnaris	50	2
A. cunninghamii	70	1
A. heterophylla	104	1
Araujia sericifera	77	4

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Arbutus andrachne	1?1	1
A. canariensis	20	2
A. menziesii	259	5
A. unedo	1896	1
Archontophoenix cunninghamiana	20	3
Arctostaphylos uva-ursi	1672	6
Ardisia crenata	71	1
A. crispa	78	2
Arduiana grandiflora	10	4
Arecastrum romanzoffianum	10	3
Aristolochia elegans	10	4
A. grandiflora	20	3
A. sempervirens	20	1
Aronia arbutifolia	276	6
A. melanocarpa	101	6
Artemisia abrotanum	20	1
A. maritima	208	8
Artocarpus heterophyllus	10	3
Arundinaria humilis	10	4
A. variegata	10	3
Arundo donax	30	2
Asclepias curassavica	10	2
A. fruticosa	10	2
Aspalathus sarcodes	10	4
Asparagus asparagoides	20	3
A. densiflorus	314	4
A. officinalis	2124	2
A. setaceus	415	4
Astartea fascicularis	2014	8
Asterolasia asteriscophora	20	8
Athrotaxis cupressoides	8	6
A. laxifolia	2	8
A. selaginoides	6	6
Aucuba japonica	2367	1
Austrocedrus chilensis	10	2
Austromyrtus dulcis	20	8
Austromyrtus tenuifolia	20	3
Azara integrifolia	198	6
A. lanceolata	85	8
A. microphylla	300	7
Baccharis pilularis	793	8
Backhousia myrtifolia	10	2
Baeckea astarteoides	118	8
B. densifolia	5	8
B. crenatifolia	5	8
B. cunninghamii	2	8
B. linifolia	609	8
B. ramosissima	35	8
B. virgata	2375	7
Bambusa arundinacea	20	1
B. glaucescens	203	6
Banksia aspleniifolia	836	8
B. canei	7	8
B. dryandroides	10	8
B. ericifolia	7494	7
B. Xgiant candles	10	8
B. integrifolia	1249	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
B. nutans	20	8
B. paludosa	783	7
B. repens	20	8
B. robur	990	7
B. serrata	3224	8
B. serratifolia	90	8
B. speciosa	40	8
B. spinulosa	5997	7
Barklya syringifolia	30	3
Bauera ribbonoides	3	8
B. rubioides	5391	1
B. Xrubiodes-sessiliflora.	32	8
B. sessiliflora	559	8
Bauhinia hookeri	20	3
B. purpurea	32	2
B. scandens	40	1
B. variegata	20	3
Beaufortia sparsa	30	8
Beaumontia grandifolia	20	1
Berberis aggregata	1	8
B. buxifolia	30	3
B. canadensis	10	2
B. darwinii	3360	2
B. dulcis	10	1
B. hookeri	20	1
B. julianae	28	8
B. lycium	605	8
B. sargentiana	50	7
B. Xstenophylla	2598	4
B. thunbergii	10468	5
B. vulgaris	163	1
B. wilsoniae	65	4
Betula albo-sinensis	7609	7
B. nana	24	8
B. papyrifera	81	5
B. pendula	18825	3
B. populifolia	6	5
B. verrucosa	1	6
Bignonia capreolata	249	3
Billardiera cymosa	10	8
Boronia anemonifolia	17	2
B. cymosa	39	8
B. denticulata	793	7
B. deanei	45	8
B. filifolia	91	8
B. floribunda	7	8
B. fraseri	27	8
B. gracilipes	30	8
B. heterophylla	1651	7
B. Xheterophylla-mollis.	10	8
B. megastigma	2165	3
B. mollis	75	8
B. molloyae	293	8
B. muelleri	102	8
B. pilosa	24	8
B. pinnata	30	2
B. serrulata	120	2

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Bosea amherstiana	10	4
Bougainvillea glabra	30	1
B. spectabilis	30	1
Bouvardia ternifolia	20	3
Brachychiton acerifolius	10	2
Brachycome angustifolia	238	8
B. multifida	181	8
Brachysema lanceolatum	20	8
B. latifolium	50	7
Brachysema sericeum	10	8
Brassaia actinophylla	621	3
Breynia disticha	10	2
Broussonetia papyrifera	10	3
Brugmansia arborea	30	1
B. sanguinea	10	2
B. suaveolens	30	1
Brunfelsia acuminata	10	1
B. australis	40	2
B. americana	20	3
B. latifolia	10	1
B. pauciflora	20	2
B. uniflora	40	1
Buddleia alternifolia	51	8
B. crispa	54	1
B. davidii	4743	3
B. globosa	246	1
B. lindleyana	40	1
B. salvifolia	1285	1
B. stenostachya	54	8
Burchellia bubalina	30	1
Butia capitata	10	4
Buxus balearica	208	7
Buxus microphylla	83	4
Buxus sempervirens	7059	1
Caesalpinia gilliesii	40	2
C. pulcherrima	30	3
C. spinosa	20	4
Calliandra tweedii	20	3
Callistemon brachyandrus	50	8
C. citrinus	12407	4
C. eastlands	10	8
C. Xeureka	20	8
C. gillelsi	10	8
C. Xharkness	410	8
C. Xkingsparkspecial	436	8
C. linearis	40	8
C. montanus	16	8
C. macropunctatus	31	4
C. phoeniceus	1157	8
C. pinifolius	95	8
C. polandii	10	8
C. rigidus	704	4
C. salignus	2755	2
C. species(guyra)	331	8
C. sp.(Mt.drum.)	10	8
C. speciosus	1549	8
C. subulatus	282	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
C. viminalis	6130	7
C. violaceus	199	8
C. viridiflorus	42	6
Callitris columellaris	39	8
C. gunni	30	1
C. huegelii	100	7
C. monticola	20	8
C. oblonga	53	8
C. preissii	4	8
C. rhomboidea	584	2
Calluna vulgaris	581	3
Calocedrus decurrens	389	4
Calocephalus brownii	644	7
Calothamnus gilesii	10	8
C. quadrifidus	667	8
C. rupestris	1	8
C. sanguineus	2	8
Calodendrum capense	12	4
Calycanthus floridus	151	1
C. occidentalis	20	3
Calytrix tetragona	81	7
Camellia Xdebbie	30	8
C. Xelsiedurie	151	8
C. Xgalaxie	45	8
C. hiemalis	362	8
C. japonica	8784	1
C. Xleonardmessel	151	8
C. maliflora	10	1
C. reticulata	150	1
C. sasanqua	11004	1
C. sinensis	50	1
C. Xwaterlily	15	8
Campsis grandiflora	928	1
C. Xguilfoylei	30	4
C. radicans	50	1
Cantua buxifolia	20	2
C. pyrifolia	10	2
Capparis mitchellii	10	2
C. spinosa	20	1
Carissa bispinosa	20	2
Carludovica palmata	10	4
Carpinus betulus	230	5
Carpobrotus edulis	1900	8
Carya illinoinensis	210	2
C. laciniosa	30	3
C. tomentosa	10	1
Caryopteris incana	13	4
Caryota urens	10	4
Cassia artemisioides	236	8
C. bicapsularis	19	4
C. eremophila	10	8
C. marilandica	10	4
C. odorata	190	8
C. surattensis	20	2
C. tora	10	2
Cassinia fulvida	60	7
Castanea crenata	20	4

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
C. sativa	1945	1
Castanospermum australe	20	1
Casuarina cristata	61	7
C. distyla	41	8
C. equisetifolia	30	8
C. inophloia	64	8
C. nana	1316	8
C. obesa	1073	8
C. paludosa	14	8
C. torulosa	2635	4
Catalpa bignonioides	1749	1
C. speciosa	1283	4
Ceanothus americanus	3	6
C. coeruleus	10	4
C. cordulatus	15	8
C. Xdelilianus	3	5
C. Xedwardsii	444	6
C. leucodermis	35	2
C. papillosus	7158	8
C. prostratus	590	8
C. thyrsiflorus	35	4
C. Xveitchianus	13	4
Cedrela sinensis	649	8
Cedronella canariensis	20	2
Cedrus atlantica	17972	3
C. deodara	49845	1
C. libani	130	1
Celastrus scandens	617	5
Celtis australis	14895	1
C. occidentalis	679	1
Centaurea aggregata	11	7
Cephalotaxus fortunii	30	2
C. harringtonia	94	8
Cerastium tomentosum	86	7
Ceratonia siliqua	90	1
Ceratopetalum apetalum	20	2
C. gummiferum	41	2
Ceratostigma griffithii	10	8
C. plumbaginoides	91	2
C. willmottianum	446	5
Cercidiphyllum japonicum	188	7
Cercis canadensis	10	4
C. chinensis	26	6
Cercis siliquastrum	1173	1
Cestrum aurantiacum	63	2
C. diurnum	30	3
C. elegans	40	1
C. fasciculatum	20	1
C. nocturnum	30	2
Chaenomeles japonica	7067	1
C. speciosa	1048	6
Chamaecyparis funebris	386	2
C. lawsoniana	11052	2
C. nootkatensis	295	2
C. obtusa	1009	2
C. pisifera	3837	2
C. thyoides	132	2

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Chamaecytisus prolifer	80	2
Chamaedorea elegans	290	4
Chamaerops humilis	30	2
Chamelaucium uncinatum	140	6
Chilianthus oleaceus	10	1
Chimonanthus praecox	557	1
Chimonobambusa falcata	10	4
Chionanthus virginicus	20	4
Chironia baccifera	10	3
Choisya ternata	7661	4
Chorizema cordatum	157	2
C. dicksonii	15	8
C. ilicifolium	20	8
Chrysalidocarpus lutescens	10	4
Chrysanthemum frutescens	10	4
Cinnamomum camphora	219	1
Cissus antarctica	145	2
C. discolor	30	2
C. rhombifolia	24	8
C. striata	15	4
Cistus albidus	150	4
C. crispus	143	8
C. clusii	50	7
C. Xcyprius	265	7
C. incanus	12	8
C. ladanifer	1341	7
C. laurifolius	50	7
C. Xpulverulentus	206	7
C. Xpurpureus	356	4
C. salviifolius	1397	7
XCitrofortunella mitis	837	8
Citrus aurantiifolia	389	1
C. limon	3670	1
C. maxima	30	1
C. medica	61	1
C. Xparadisi	314	3
C. reticulata	255	1
C. sinensis	712	1
Cladrastis lutea	30	4
Clematis aristata	100	7
C. armandii	65	8
C. balearica	6	8
C. campaniflora	10	2
C. chrysocoma	44	8
C. flammula	30	3
C. florida	40	1
C. heracleifolia	20	2
C. Xjackmanii	388	3
C. lanuginosa	30	2
C. montana	2336	2
C. orientalis	91	6
C. paniculata	165	4
C. Xpatens	35	3
C. tangutica	100	7
C. virginiana	30	2
C. Xviticella-flammula	20	3
Clerodendron glabrum	20	3

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
C. nutans	10	2
C. philippinum	20	2
C. speciosissimum	20	2
C. splendens	40	2
C. thomsoniae	30	3
C. trichotomum	110	4
Clethra arborea	41	4
Cleyera japonica	10	4
Clianthus puniceus	35	2
Clytostoma callistegioides	30	2
Cobaea scandens	30	1
Cocos nucifera	11	4
Coffea arabica	30	2
Coleonema album	2105	1
C. compacta	15123	8
C. microphylla	29	8
C. pulchrum	6632	6
Colletia cruciata	20	2
Columnea scandens	40	2
C. schiedeana	10	2
Convolvulus cneorum	202	7
C. mauritanicus	2645	4
Coprosma Xkirkii	11798	7
C. lucida	36	3
C. repens	45	3
Cordyline australis	5089	1
C. indivisa	30	3
C. stricta	30	3
C. terminalis	494	1
Cornus alba	6	6
C. canadensis	47	6
C. capitata	429	4
C. controversa	23	8
C. coreana	34	8
C. florida	3989	6
C. kousa	166	7
C. mas	33	8
C. nuttallii	150	7
C. sanguinea	112	7
C. sericea	598	7
Corokia buddleioides	38	8
C. cotoneaster	997	6
C. lancifolia	14	7
Coronilla emerus	20	3
C. valentina	30	2
Correa alba	962	7
C. backhousiana	55	7
C. baeuerlenii	111	8
C. decumbens	820	8
C. Xduskybells	470	8
C. glabra	2167	8
C. Xmanii	4642	7
C. pulchella	212	2
Cortaderia selloana	540	3
Corylopsis spicata	200	3
C. willmottiae	10	8
Corylus maxima	50	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Corylus avellana	886	1
Corynabutilon vitifolium	20	3
Corynocarpus laevigata	30	1
Cotinus coggygria	1635	1
Cotoneaster adpressus	453	7
C. affinis	20	3
C. buxifolius	1401	3
C. congestus	30	8
C. conspicuus	31	8
C. dammeri	4638	7
C. dielsianus	4	6
C. divaricatus	2	8
C. franchetii	5120	5
C. frigidus	222	6
C. glaucophyllus	13448	6
C. horizontalis	13451	6
C. lacteus	621	7
C. microphyllus	7586	2
C. pannosus	7542	6
C. rotundifolius	1500	6
C. salicifolius	5988	6
C. simonsii	2570	4
Cotyledon orbiculata	150	7
Crassula arborescens	100	8
C. argentea	89	8
Crataegus azarolus	21	2
C. crus-galli	537	4
C. douglasii	42	8
C. Xgrignonensis	30	8
C. laevigata	3191	1
C. Xlavallei	539	5
C. mexicana	654	5
C. monogyna	1300	1
C. phaenopyrum	1731	6
C. pubescens	29	7
C. tanacetifolia	72	5
C. uniflora	363	6
Crinodendron patagua	10	5
Crowea exalata	50	8
C. Xexalata-saligna	200	8
C. saligna	200	8
Cryptandra scortechinii	10	8
Cryptomeria japonica	4768	1
Cryptostegia grandiflora	10	2
Cunninghamia lanceolata	40	2
Cuphea ignea	20	2
C. micropetala	10	3
C. Xpurpurea	30	2
XCupressocyparis leylandii	1120	8
Cupressus arizonica	9161	5
C. cashmeriana	648	2
C. glabra	8	5
C. goveniana	1187	2
C. guadalupensis	50	3
C. lusitanica	468	1
C. macnabiana	56	2
C. macrocarpa	9490	2

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
C. sempervirens	21361	1
C. torulosa	11504	1
Cyathodes juniperina	8	8
Cycas media	20	3
Cycas revoluta	30	3
Cydonia oblonga	1632	1
Cyperus alternifolius	100	3
C. papyrus	10	4
Cyphomandra betacea	10	4
Cyrilla racemiflora	73	7
Cytisus albus	90	2
C. Xburkwoodii	725	6
C. canariensis	20	1
C. Xdallimorei	34	8
C. decumbens	216	8
C. Xlilactime	65	8
C. multiflorus	10	4
C. nigricans	30	1
C. Xpraecox	200	8
C. purpurea	31	8
C. racemosus	62	8
C. scoparius	703	4
C. supranubius	146	8
Daboecia cantabrica	485	4
Dacrydium cupressinum	6	3
D. franklinii	8	3
Dampiera diversifolia	50	8
Daphne Xburkwoodii	1375	8
D. cneorum	359	7
D. Xhybrida	20	1
D. genkwa	10	1
D. laureola	10	1
D. mezereum	10	3
D. odora	3196	1
Darwinia citriodora	160	8
D. fascicularis	12	8
D. homoranthoides	60	8
D. leiostyla	10	8
D. taxifolia	20	8
Davallia fejeensis	2	8
Davidia involucrata	30	8
Delonix regia	10	3
Deutzia crenata	189	3
D. discolor	10	4
D. gracilis	66	2
D. Xkalmiiflora	428	7
D. Xlemoinei	2081	4
D. longifolia	2	6
D. Xrosea	80	4
D. scabra	106	1
D. setchuenensis	10	4
Dictyosperma album	20	3
Dioscorea discolor	10	3
Diosma ericoides	40	1
Diospyros kaki	527	2
Dipilopappus filifolius	10	4
Disanthus cercidifolius	1	6

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Distictis buccinatoria	10	1
D. lactiflora	116	8
Dizygotheca elegantissima	100	3
Dodonaea cuneata	7	8
Dolichos lignosus	30	1
Dombeya burgessiae	10	3
Doryanthes excelsa	60	2
Doryphora sassafras	10	2
Dovyalis caffra	10	4
Doxantha capreolata	10	2
Dracaena deremensis	13	3
D. draco	10	3
D. fragrans	10	4
Drimys aromatica	6	8
Drosanthemum floribundum	802	8
Duranta repens	62	1
Eccremocarpus scaber	10	4
Echeveria Xsetoliver	10	7
Echium candicans	10	4
Edgeworthia papyrifera	2	2
Elaeagnus angustifolia	450	3
E. commutata	10	4
E. macrophylla	7	5
E. multiflora	90	4
E. pungens	3930	3
E. umbellata	309	6
Elaeocarpus hookerianus	100	8
E. reticulatus	41	2
Enkianthus campanulatus	141	6
Ensete ventricosum	10	4
Entelea arborescens	10	3
Epacris impressa	103	7
E. longiflora	225	2
E. obtusifolia	15	8
Epipremnum aureum	72	8
Eranthemum pulchellum	10	3
Eremophila divaricata	10	8
E. laanii	10	8
E. scoparia	30	8
Erica arborea	110	3
E. Xaurora	152	8
E. baccans	10	1
E. bauera	20	1
E. canaliculata	475	8
E. carnea	448	3
E. XCavandishii	10	3
E. ciliaris	106	7
E. cinerea	322	7
E. Xdarleyensis	2185	7
E. gracilis	114	8
E. hyemalis	10	3
E. jubilee	30	8
E. linnaeoides	101	7
E. mediterranea	16897	3
E. melanthera	982	6
E. persoluta	13	3
E. pyramidalis	667	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
E. sicifolia	100	8
E. tetralix	21	7
E. vagans	51	8
E. ventricosa	13	3
E. verticillata	10	1
E. Xwilmorei	63	3
Eriobotrya japonica	1650	1
Eriocephalus africanus	36	8
Eriostemon myoporoides	300	3
E. nodiflorus	115	8
E. Xstardust	2897	8
E. verrucosus	60	8
Erythrina Xbidwillii	30	1
E. blakeii	30	1
E. caffra	40	1
E. corallodendrum	20	1
E. crista-galli	40	1
E. herbacea	20	1
E. parcelii	20	3
E. secundifolia	20	2
E. speciosa	20	3
E. variegata	10	4
E. vespertilio	20	1
Escallonia bifida	151	2
E. Xexoniensis	50	4
E. Xiveyi	1329	8
E. Xlangleyensis	892	8
E. laevis	80	1
E. Xrockii	451	8
E. rosea	105	8
E. rubida	10030	1
Eucalyptus acaciiformis	522	8
E. aggregata	13076	6
E. albens	6732	8
E. alpina	43	8
E. amygdalina	10	3
E. angophoroides	2500	8
E. argophloia	525	7
E. astringens	36	8
E. bancroftii	30	8
E. botryoides	282	4
E. burdettiana	50	8
E. caesia	30	8
E. calophylla	10	4
E. camaldulensis	1267	4
E. campaspe	180	7
E. citriodora	10	3
E. cladocalyx	25	4
E. coccifera	833	6
E. cornuta	28	8
E. cosmophylla	203	8
E. crenulata	4132	7
E. curtisii	180	8
E. dawsonii	180	7
E. diversicolor	22	4
E. diversifolia	10	6
E. elata	19313	5

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

		Relative Number Planted	Period introduced
E.	ficifolia	47	4
E.	forrestiana	40	8
E.	fraxinoides	375	6
E.	gillii	1	8
E.	glaucescens	1459	6
E.	globoidea	3	5
E.	globulus	17455	4
E.	grandis	51	6
E.	gregsoniana	6599	3
E.	gummifera	20	4
E.	gunnii	625	4
E.	haemastoma	32	3
E.	johnstonii	200	8
E.	kitsoniana	64	8
E.	kybeanensis	322	8
E.	lansdowneana	130	8
E.	largiflorens	10	3
E.	lehmannii	325	7
E.	leucoxylon	16521	4
E.	ligustrina	42	8
E.	linearis	113	6
E.	longifolia	119	3
E.	macarthurii	6784	5
E.	macrocarpa	874	8
E.	maculata	100	7
E.	maidenii	14788	5
E.	marginata	10	3
E.	moluccana	10	4
E.	moorei	3030	6
E.	nicholii	30212	6
E.	nitens	5	6
E.	novaanglica	160	7
E.	nutans	153	8
E.	obliqua	944	3
E.	olsenii	1300	8
E.	ovata	369	6
E.	paniculata	214	4
E.	parvifolia	3015	8
E.	pilularis	10	3
E.	piperita	10	4
E.	populnea	25	8
E.	pulchella	8316	7
E.	pulverulenta	6894	5
E.	racemosa	206	6
E.	radiata	179	6
E.	regnans	935	4
E.	resinifera	10	4
E.	risdonii	985	7
E.	robusta	10	3
E.	rodwayi	1605	8
E.	saligna	289	4
E.	st johni	8947	8
E.	scoparia	2532	8
E.	sideroxylon	19846	6
E.	sieberi	306	5
E.	stricklandii	860	6
E.	stricta	210	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
E. tereticornis	273	3
E. torquata	58	7
E. umbellata	25	6
E. uncinata	10	8
E. virdis	362	7
E. Xvitrea	16	6
E. youmanii	1739	8
Eucryphia lucida	6	6
Eugenia brasiliensis	20	2
E. uniflora	10	3
Euonymus europaea	42	1
E. fimbriata	10	2
E. fortunei	866	2
E. japonicum	350	1
E. latifolia	13	4
E. nana	52	6
E. obovata	592	8
Eupatorium coelestinum	10	2
Euphorbia fulgens	20	1
E. milii	40	2
E. pulcherrima	40	2
E. splendens	50	1
E. wulfenii	87	8
Eupomatia laurina	20	2
Euryops pectinatus	561	7
Eutaxia cuneata	20	8
E. obovata	30	8
Exochorda giraldii	31	8
E. racemosa	195	5
Fabiana imbricata	24	3
Fagus sylvatica	228	1
XFatshedera lizei	315	7
Fatsia japonica	376	2
Feijoa sellowiana	3336	6
Felicia amelloides	3539	4
Ficus aspera	20	3
F. benjamina	46	4
F. bengalensis	10	2
F. carica	2073	1
F. elastica	96	2
F. hilli	74	7
F. lyrata	6	8
F. macrophylla	145	1
F. pumila	883	1
F. religiosa	10	2
F. rubiginosa	40	2
F. sagittata	10	4
F. sycomorus	20	1
Firmiana simplex	157	6
Fitzroya cupressoides	10	3
Flacourtia jangomans	10	1
Forsythia Xintermedia	4705	6
F. suspensa	1989	2
F. viridissima	962	1
Fortunella margarita	167	3
Fraxinus americana	196	4
F. angustifolia	16025	5

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
F. caroliniana	4	5
F. excelsior	1292	1
F. nigra	14	5
F. ornus	134	1
F. pennsylvanica	303	6
F. velutina	1535	7
Fuchsia corymbiflora	10	2
F. Xexoniensis	10	2
F. fulgens	10	2
F. magellanica	20	2
F. procumbens	10	4
Garcinia mangostana	10	2
Gardenia jasminoides	1860	1
G. thunbergia	40	1
Garrya elliptica	1663	2
Gaultheria hispida	4	8
Geijera parviflora	9	6
Gelsemium sempervirens	7382	2
Genista aethnensis	2	6
G. anglica	10	1
G. monosperma	50	8
G. monspessulana	9	5
G. tinctoria	37	8
Ginkgo biloba	1096	2
Gleditsia triacanthos	9277	1
G. moraine	809	8
G. sinensis	20	1
Gordonia axillaris	200	7
Graptophyllum earlii	10	4
G. pictum	20	1
Grevillea acanthifolia	318	8
G. alpina	2721	4
G. anethifolia	30	8
G. aquifolium	192	8
G. arenaria	82	8
G. argyrophylla	50	8
G. aspleniifolia	572	8
G. audrayae	7685	7
G. banksii	12	2
G. barklyana	80	8
G. baueri	8003	7
G. Xbauerijohnevans	130	8
G. bipinnatifida	20	8
G. biternata	4666	7
G. brevicuspis	10	8
G. brownii	30	8
G. buxifolia	1	6
G. caleyi	90	1
G. Xcanberragem	7112	7
G. capitellata	40	8
G. chrysophaea	35	8
G. Xclearviewdavid	2366	8
G. Xclearviewrobin	112	8
G. confertifolia	383	8
G. Xcrosbie morris.	920	8
G. Xdarganhill	55	8
G. diminuta	50	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

		Relative Number Planted	Period introduced
G.	dimorpha	599	8
G.	endlicheriana	10	8
G.	fasciculata	20	8
G.	Xgaudichaudii	8620	8
G.	glabella	1224	8
G.	glabrata	523	8
G.	hilliana	30	2
G.	hookerana	796	8
G.	Xhookerana-cal.	38	8
G.	Xivanhoe	2713	8
G.	jenkinsii	396	8
G.	jephcottii	40	8
G.	johnsonii	4	8
G.	laurifolia	1281	7
G.	lavandulacea	1106	6
G.	linearifolia	10	8
G.	longifolia	153	2
G.	longistyla	228	8
G.	miqueliana	304	8
G.	mucronulata	496	8
G.	obtusiflora	4228	8
G.	oleoides	40	8
G.	Xolympic flame	45	8
G.	paniculata	320	8
G.	parviflora	85	8
G.	Xpink pearl	3017	8
G.	Xpoorindabeauty	30	8
G.	blondie	68	8
G.	const.	2286	7
G.	diadem	30	8
G.	elegan.	715	7
G.	firebird	525	8
G.	goldenlyre	20	8
G.	hula	30	8
G.	illuminina	180	8
G.	leane	1822	7
G.	peter	1534	8
G.	pinkcoral	50	8
G.	queen	400	8
G.	rachel	20	8
G.	refrain	20	8
G.	rondea	336	8
G.	royalmantel	3391	8
G.	signet	150	8
G.	wonder	20	8
G.	repens	50	8
G.	rivularis	206	8
G.	robusta	3236	1
G.	Xrobyngordon	265	8
G.	rosmarinifolia	47178	6
G.	sericea	159	8
G.	shiressii	10	8
G.	Xshirleyhowie	20	8
G.	speciosa	209	8
G.	steiglitziana	108	8
G.	thelemanniana	145	8
G.	tridentifera	10	8

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	Relative Number Planted	Period introduced
G. trinervis	50	8
G. triloba	43	8
G. vestita	39	7
G. victoria	50	7
G. willisii	99	8
Grewia occidentalis	10	4
Griselinia littoralis	100	8
Guichenotia macrantha	30	8
Hakea acicularis	7155	8
H. bakeriana	17	8
H. dactyloides	379	8
H. eriantha	18678	7
H. gibbosa	52	8
H. laurina	193	3
H. multilineata	38	6
H. nitida	7	8
H. nodosa	70	8
H. petiolaris	245	8
H. propinqua	99	8
H. salicifolia	19131	7
H. saligna	1200	8
H. suaveolens	96	4
H. teretifolia	5969	8
H. varia	9	8
Halesia tetraptera	23	1
Halgania cyanea	2	8
Halimium lasianthum	10	2
Hamamelis mollis	10	6
Hamelia patens	20	2
Hardenbergia comptoniana	89	6
Harpullia pendula	10	3
Hebe albicans	55	3
H. amplexicaulis	35	7
H. Xandersonii	1773	2
H. balfouriana	2020	6
H. buxifolia	7216	4
H. Xcarnea	4	5
H. cupressoides	1	6
H. decumbens	1331	8
H. diosmifolia	30	4
H. elliptica	6487	3
H. glaucophylla	684	8
H. gracilima	16	4
H. hulkeana	441	4
H. inspiration	180	8
H. Xla seduisante	7277	5
H. Xlobelioides	10	4
H. lycopodioides	100	8
H. parvifolia	26	4
H. pinguifolia	12	8
H. rakiensis	30	8
H. recurva	10	8
H. salicifolia	33	2
H. speciosa	1184	2
H. Xwairiki	93	8
Hedera canariensis	8030	4
H. helix	24668	1

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	Relative Number Planted	Period introduced
H. rhombea	10	4
Hedysarum multijugum	20	4
Hedyscepe canterburyana	20	3
Helenium autumnale	2	6
Heliconia metallica	10	3
Heliotrope arborescens	10	2
Hemiandra pungens	80	8
Heterocentron elegans	3	8
Hibbertia astroticha	152	8
H. cuneiformis	30	8
H. empetrifolia	40	8
H. microphylla	15	8
H. procumbens	47	6
H. scandens	98	8
H. serpyllifolia	119	8
H. stellaris	10	8
Hibiscus camdeni	10	4
H. elatus	10	4
H. grandiflorus	50	2
H. heterophyllus	10	2
H. mutabilis	11	1
H. parkerii rosea	10	4
H. pedunculatus	10	4
H. rosa-sinensis	30	1
H. splendens	40	1
H. syriacus	5163	1
H. trionum	53	7
Hoheria populnea	386	8
Holmskioldia sanguinea	10	2
Holodiscus discolor	10	4
Homoranthus darwinioides	6	8
H. flavescens	5	8
Hovenia dulcis	101	1
Howea belmoreana	80	3
H. forsterana	51	3
Hoya australis	10	1
H. bella	20	1
H. carnosa	58	1
H. coronaria	10	3
H. imperialis	10	3
Hydrangea anomala	169	7
H. aspera	43	7
H. macrophylla	5970	1
H. paniculata	578	4
H. quercifolia	366	3
Hymenosporum flavum	30	2
Hypericum calycinum	5107	8
H. chinense	18	3
H. hookeranum	15	2
H. leschenaultii	175	8
H. Xmoseranum	561	4
H. olympicum	20	1
H. patulum	4166	6
H. reptans	4616	7
Hypocalymma angustifolium	252	8
H. cordifolium	71	8
Hyssopus officinalis	10	2

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	Relative Number Planted	Period introduced
Idesia polycarpa	81	8
Ilex aquifolium	1638	1
I. cornuta	56	2
I. crenata	38	8
I. opaca	10	4
I. paraguariensis	16	4
Illicium anisatum	30	1
Indigofera incarnata	55	2
Ipomoea acuminata	10	4
I. alba	10	4
I. pandurata	10	4
I. purpurea	100	6
Isopogon anemonifolius	212	8
I. anethifolius	90	8
Itea ilicifolia	5	8
Ixora chinensis	30	1
I. coccinea	30	1
I. javanica	10	3
Jacaranda mimosifolia	50	2
Jacksonia scoparia	10	8
Jasminum azoricum	10	3
J. fruticans	38	1
J. grandiflorum	32	1
J. humile	20	1
J. leratti	10	2
J. lineare	10	1
J. mesnyi	5639	5
J. multiflorum	35	1
J. nudiflorum	225	2
J. officinale	43	1
J. parkerii	235	7
J. polyanthum	3196	6
J. sambac	10	2
J. Xstephanense	8	8
J. volubile	10	1
Juglans ailantifolia	303	4
J. microcarpa	3714	7
J. nigra	1114	3
J. regia	1495	1
Juniperus bermudiana	64	1
J. chinensis	2478	1
J. communis	2196	1
J. conferta	8234	7
J. deppeana	433	8
J. drupacea	2	5
J. excelsa	45	1
J. horizontalis	1977	1
J. Xmedia	67	7
J. oxycedrus	40	1
J. sabina	15327	1
J. scopulorum	213	8
J. squamata	322	7
J. thurifera	36	8
J. virginiana	676	1
Justicia adhatoda	10	4
J. carnea	30	1
J. cydoniifolia	10	2

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	Relative Number Planted	Period introduced
J. magnifica	10	4
J. rizzinii	10	3
J. spicigera	10	3
Kalanchoe pinnata	10	2
Kalmia angustifolia	73	5
K. latifolia	380	2
Kalmiopsis leachiana	30	8
Kennedia beckyiana	10	8
K. coccinea	7	8
K. eximia	40	8
K. glabrata	20	8
K. macrophylla	10	8
K. nigricans	2105	8
K. rubicunda	98	5
Kerria japonica	2959	1
Koelreuteria paniculata	1865	1
Kolkwitzia amabilis	1865	6
Kunzea amabilis	2868	8
K. ambigua	1426	8
K. baxteri	296	8
K. capitata	50	8
K. ericifolia	10	8
K. flavescens	72	8
K. parvifolia	100	7
K. pomifera	1123	8
Laburnum anagyroides	327	1
L. Xwatereri	454	8
Laccospadix australasica	2	8
Lagerstroemia indica	3866	1
Lagunaria patersonii	30	1
Lambertia formosa	215	7
Lampranthus aureus	200	8
L. brownii	280	8
Lantana camara	10	1
L. montevidensis	10	1
Lapageria rosea	25	4
Lardizabala biternata	10	2
Larix decidua	41	2
L. Xeurolepis	6	5
Lasiopetalum schulzenii	37	7
Latania loddigesii	10	4
L. lontaroides	10	3
Laurus nobilis	787	1
Lavandula angustifolia	10104	2
L. dentata	405	2
L. stoechas	537	4
Lechenaultia biloba	90	8
L. formosa	189	8
Leonotis leonurus	75	8
Lepidorrhachis mooreana	20	3
Lepidozamia peroffskyana	10	4
Leptospermum attenuatum	18	8
L. brachyandrum	255	8
L. flavescens	2890	7
L. laevigatum	1525	5
L. luehmannii	18	8
L. nitidum	36	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
L. petersonii	246	8
L. rotundifolium	3558	7
L. scoparium	8530	6
L. squarrosum	215	8
Lespedeza bicolour	1	6
Leucodendron argenteum	10	3
L. salignum	25	7
L. silvanred	20	7
Leucothoe axillaris	10	3
L. fontanesiana	85	7
L. recurva	48	7
Leycesteria formosa	22	1
Libocedrus plumosa	10	4
Licuala grandis	10	4
Ligustrum japonicum	139	1
L. lucidum	1096	1
L. ovalifolium	55	4
L. sinensis	2595	2
L. vulgare	3017	1
Liquidambar formosana	67	8
L. orientalis	604	7
L. styraciflua	11832	1
L. tiriki	31	8
Liriodendron tulipifera	1569	2
Litchi chinensis	10	3
Lithocarpus glaber	1	6
Lithodora diffusa	701	8
Livistona australis	60	1
L. chinensis	78	3
Lomatia myricoides	250	7
Lonicera caprifolium	36	1
L. etrusca	78	4
L. fragrantissima	1470	5
L. Xheckrottii	2067	8
L. japonica	6051	1
L. nitida	4788	5
L. periclymenum	20	2
L. pileata	358	8
L. reticulata	672	6
L. sempervirens	13	1
L. tatarica	8	6
Lophomyrtus bullata	150	7
L. ralphii	1	6
Loropetalum chinense	1739	7
Lotus berthelotii	10	4
Luculia gratissima	11	2
Lycium ferocissimum	100	4
L. horridum	10	4
Lygodium japonicum	22	3
L. scandens	20	3
Macadamia integrifolia	20	3
Macfadyena unguis-cati	20	3
Mackaya bella	20	3
Macrozamia communis	20	3
M. miquelii	10	4
M. spiralis	10	3
Maclura pomifera	100	1

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Magnolia acuminata	10	1
M. co'co	10	1
M. grandifolia	1556	1
M. heptapeta	156	1
M. Xloebneri	28	8
M. quinquepeta	158	1
M. salicifolia	3	7
M. sieboldii	28	8
M. sinensis	11	3
M. stellata	1932	5
M. Xsoulangiana	1857	1
M. Xthompsoniana	20	1
M. tripetala	10	3
M. Xveitchii	62	8
Mahonia aquifolium	3772	2
M. bealei	761	2
M. fortunii	30	1
M. japonica	209	2
M. lomariifolia	40	7
M. napaulensis	15	7
Malus angustifolia	50	6
M. Xatrosanguinea	10	4
M. chofa	92	8
M. Xdomestica	20083	1
M. floribunda	1155	4
M. Xgorgeous	696	7
M. halliana	10	4
M. ioensis	700	8
M. Xpurpurea	840	6
M. Xscheideckeri	40	4
M. spectabilis	2221	4
M. sylvestris	25	6
M. toringoides	250	7
M. veitchs scarlet	234	6
Mandevilla Xamabilis	10	3
M. boliviensis	20	3
M. laxa	75	1
Manettia cordifolia	30	2
M. inflata	10	4
Mangifera indica	20	3
Marattia fraxinea	10	4
Margyricarpus setosus	1	6
Medinilla magnifica	10	4
Melaleuca armillaris	18878	7
M. bracteata	1508	8
M. decora	16	8
M. decussata	2293	5
M. diosmifolia	30	8
M. elliptica	80	8
M. ericifolia	16278	7
M. fulgens	144	8
M. gibbosa	17	8
M. huegelii	13	8
M. hamulosa	10	8
M. hypericifolia	180	4
M. incana	4455	7
M. lanceolata	70	8

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	Relative Number Planted	Period introduced
M. lateritia	936	8
M. laxiflora	119	8
M. linariifolia	4755	7
M. micromera	76	8
M. minutifolia	10	8
M. nesophila	50	8
M. nodosa	46	8
M. pulchella	336	8
M. spathulata	10	8
M. steedmanii	85	8
M. styphelioides	178	8
M. squarrosa	1332	8
M. thymifolia	4284	7
M. violacea	530	8
M. wilsonii	1616	7
Melastoma malabathricum	10	3
Melia azedarach	2754	1
Melianthus major	625	1
M. minor	10	1
Menispermum canadense	10	4
Mespilus germanica	40	1
Metasequoia glyptostroboides	366	8
Metrosideros excelsus	24	2
Michelia champaca	10	8
M. doltsopa	34	8
M. figo	2912	1
M. fuscata	695	6
Microcachrys tetragona	12	8
Microlepia strigosa	10	3
Micromyrtus ciliata	50	8
Mitraria coccinea	10	3
Mitriostigma axillare	110	3
Monstera deliciosa	129	4
Morus alba	3940	1
M. nigra	368	2
Muehlenbeckia complexa	2874	7
Muraltia heisteria	10	1
Murraya paniculata	67	2
Musa acuminata	40	1
Musa Xparadisiaca	40	2
Myoporum debile	268	7
M. floribunda	48	8
M. montanum	104	6
M. parvifolium	18487	7
M. prostrate	86	7
Myrsine urvillia	10	2
Myrtus communis	2282	1
Nandina domestica	18083	1
Nerium oleander	9101	1
Nothofagus cliffortioides	100	8
N. cunninghamii	60	1
N. fusca	20	8
N. solandri	20	8
N. truncata	100	8
Nyssa sylvatica	446	7
Ochna multiflora	10	4
Olea europaea	1273	1

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	Relative Number Planted	Period introduced
Olearia argophylla	100	4
O. avicennifolia	10	3
O. capillaris	10	3
O. frostii	4	6
O. ramulosa	12	7
O. stellulata	1118	7
O. teretifolia	10	8
O. traversii	70	3
Omalanthus populifolius	23	8
Osmanthus armatus	47	8
O. americanus	20	1
O. delavayi	111	7
O. fragrans	178	2
O. heterophyllus	1623	2
Osteospermum ecklonis	16	8
Ostrya carpinifolia	35	8
O. virginiana	52	6
Owenia venosa	10	3
Oxera pulchella	10	3
Oxydendrum arboreum	62	7
Oxylobium lanceolatum	10	8
Oxypetalum caeruleum	62	2
Pachysandra terminalis	3856	6
Pachystachys coccinea	10	1
Paeonia lutea	2	6
P. officinalis	120	1
P. suffruticosa	72	1
Paliurus spina-christi	10	3
Pandanus baptistii	10	4
P. pedunculatus	10	3
P. utilis	20	2
P. veitchii	20	3
Pandorea jasminoides	673	1
P. pandorana	214	2
Parahebe linifolia	10	3
P. lyallii	50	8
Parkinsonia aculeata	10	2
Parrotia persica	1594	8
Parthenocissus henryana	17	5
P. quinquefolia	761	2
P. tricuspidata	1291	4
Passiflora alata	30	1
P. antioquiensis	20	3
P. Xbonaparta	10	2
P. caerulea	22	2
P. edulis	1373	2
P. Xexoniensis	10	4
P. incarnata	10	4
P. manicata	30	2
P. mollissima	72	4
P. pinnatistima	10	1
P. quadrangularis	20	3
P. racemosa	20	2
P. Xracemosa/caerulea	20	2
P. raddiana	10	1
P. trifasciata	10	3
Paulownia tomentosa	175	2

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Pavonia hastata	5	8
Pedilanthus tithymaloides	10	3
Pelargonium Xdomesticum	3281	2
P. Xelkhorn	200	7
P. Xhortorum	1649	3
P. peltatum	486	8
Pellaea rotundifolia	2	8
Pentas kermesina	10	3
P. lanceolata	10	2
Periploca graeca	66	2
Persea americana	10	2
Persoonia oxycoccoides	25	8
P. pinifolia	63	8
P. rotundifolium	33	8
Petrea volubilis	20	2
Pharbitis learii	10	3
Phebalium glandulosa	10	8
P. squamulosum	20	8
Phellodendron amurense	198	7
Philadelphus coronarius	853	1
P. inodorus	261	2
P. karwinskyanus	81	8
P. lewisii	20	3
P. mexicanus	61	2
P. microphyllus	10	4
P. pekinensis	10	4
P. pubescens	10	2
P. Xvirginalis	805	5
Phillyrea angustifolia	3	8
Philodendron bipinnatifidum	50	8
P. cordatum	47	8
P. imbe	27	8
P. lundii	7	8
P. selloum	182	8
Phlomis fruticosa	1116	8
Phoenix acaulis	10	4
P. canariensis	60	4
P. dactylifera	36	2
P. reclinata	10	4
P. roebelenii	45	7
P. rupicola	5	4
P. sylvestris	10	4
Phormium colensoi	10	3
P. tenax	1406	1
Photinia beauverdiana	25	8
P. glabra	17456	3
P. serrulata	4491	2
Phygelius capensis	20	2
Phyla nodiflora	5460	8
Phyllocladus aspleniifolius	6	8
Phyllostachys aurea	14	8
P. bambusoides	447	8
P. nigra	334	1
P. viridiglaucescens	91	8
Physalis peruviana	160	3
Physocarpus opulifolius	13	5
Picea abies	947	1

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
P. glauca	380	2
P. morinda	10	1
P. omorika	72	8
P. orientalis	105	6
P. pungens	1640	6
P. rubens	10	2
P. sitchensis	29	8
P. smithiana	30	2
Pieris forrestii	227	7
P. japonica	2049	6
P. phillyreifolia	10	3
Pimelea ferruginea	222	3
P. filiformis	13	8
P. imbricata	27	8
P. rosea	25	8
Pinus ayacahuite	11	8
P. bungeana	200	8
P. canariensis	4788	1
P. cembroides	14	1
P. coulteri	34	8
P. gerardiana	10	1
P. greggi	399	8
P. halepensis	1855	1
P. lambertiana	16	3
P. muricata	110	4
P. montezumae	37	1
P. mugo	182	3
P. nigra	190	2
P. patula	5066	8
P. pinaster	60	1
P. pinea	2707	1
P. ponderosa	528	2
P. pringlei	322	8
P. pumila	10	3
P. quadrifolia	10	3
P. radiata	71779	2
P. rigida	10	3
P. roxburghii	45	1
P. sabiniana	120	3
P. strobus	47	2
P. sylvestris	50	2
P. taeda	18	4
P. teocote	10	2
P. thunbergiana	983	5
P. torreyana	328	6
P. virginiana	465	8
P. wallichiana	30	1
Pistacia atlantica	2	8
P. chinensis	5338	6
Pittosporum crassifolium	791	3
P. eugenioides	5086	2
P. phillyraeoides	126	6
P. revolutum	10	1
P. rigidum	10	3
P. tenuifolium	1280	2
P. tobira	53	2
P. undulatum	116	2

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Platanus Xacerifolia	16287	5
P. occidentalis	83	5
P. orientalis	12986	2
P. wrightii	176	5
Platycladus orientalis	4180	1
Platymiscium orientalis	2347	8
Plumbago auriculata	201	2
P. indica	20	2
Plumeria rubra	30	4
Podalyria calyptrata	10	1
Podocarpus dacrydioides	27	6
P. elatus	13	3
P. ferrugineus	20	2
P. hallii	100	8
P. macrophyllus	53	2
P. montanus	10	2
P. neriifolius	10	2
P. nubigenus	10	3
P. spinulosa	33	3
P. totara	36	2
Podranea ricasoliana	50	8
Polygala chamaebuxus	10	2
P. Xdalmaisiana	135	4
P. myrtifolia	442	2
P. oppositifolia	10	2
P. Xpalma	10	3
P. virgata	10	1
Polyscias guilfoylei	10	3
Populus alba	11046	3
P. Xandrosseoggin	178	8
P. balsamifera	216	3
P. Xberolinensis	14	8
P. Xcanadensis	64	5
P. deltoides	19004	5
P. lasiocarpa	12	6
P. nigra	5362	1
P. Xoxford	16	8
P. simonii	3523	6
P. tremula	2026	3
P. yunnensis	1136	6
Portulacaria afra	100	8
Potentilla anserina	1208	8
P. nepalensis	62	8
Prestonia venosa	10	1
Prionotes cerinthoides	6	6
Prostanthera aspalathoides	108	7
P. baxteri	35	8
P. cryptandroides	10	8
P. cuneata	200	7
P. denticulata	90	8
P. hirtula	9	8
P. incana	268	7
P. incisa	10	8
P. lasianthos	100	7
P. nivea	1241	7
P. ovalifolia	3154	6
P. phylicifolia	30	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
P. poorindaballerina.	13	8
P. poorindadavid	10	8
P. rhombea	25	8
P. rotundifolia	345	7
P. saxicola	359	8
P. scutellarioides	10	8
P. sieberi	1	6
P. stricta	10	8
P. violacea	77	6
Protea cynaroides	14	8
P. grandiceps	55	8
P. mellifera	52	1
P. neriifolia	39	8
P. susannae	39	8
Prunus americana	12265	1
P. avium	6566	1
P. Xblireiana	2168	4
P. campanulata	476	8
P. cerasifera	5509	3
P. cerasus	71	1
P. dulcis	3147	1
P. domestica	4380	1
P. glandulosa	2398	4
P. ilicifolia	100	2
P. incisa	30	8
P. insititia	75	3
P. japonica	999	4
P. laurocerasus	1870	1
P. lusitanica	2118	1
P. maritima	1921	8
P. mume	2480	4
P. nigra	252	5
P. padus	361	4
P. persica	31469	1
P. salicina	1010	2
P. serotina	282	7
P. serrulata	2191	6
P. simonii	10	4
P. subhirtella	15	2
P. triloba	533	4
P. virginiana	10	4
P. Xyedoensis	427	7
Pseuderanthemum bicolor	10	4
P. tuberculatum	20	3
Pseudolarix amabilis	10	2
Pseudotsuga menziesii	129	3
Psidium guajava	50	1
P. littorale	41	1
Pultenaea flexilis	69	8
P. pedunculata	20	8
P. subternata	10	8
P. villosa	3	8
Punica granatum	4139	1
Pyracantha atalantioides	279	6
P. angustifolia	31551	5
P. coccinea	1002	1
P. crenulata	6262	4

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8=1970)

	Relative Number Planted	Period introduced
P. fortuneana	9226	5
P. koidzumii	97	6
P. rogersiana	3387	6
Pyrostegia venusta	30	1
Pyrus calleryana	2304	8
P. communis	9892	1
P. pyrifolia	111	5
P. salicifolia	24	8
P. ussuriensis	1862	6
Quercus acutissima	1854	8
Q. alba	751	8
Q. bicolor	4026	5
Q. canariensis	1688	6
Q. cerris	3236	1
Q. coccinea	2090	4
Q. engelmannii	500	7
Q. faginea	2567	8
Q. falcata	213	8
Q. ilex	1394	1
Q. incana	2	6
Q. lusitanica	2057	4
Q. macrocarpa	1824	2
Q. macrolepis	10	1
Q. marilandica	10	1
Q. muehlenbergii	4	8
Q. nigra	74	8
Q. palustris	29721	1
Q. phillyraeoides	6	5
Q. robur	5706	1
Q. rubra	1001	4
Q. suber	4234	1
Q. velutina	10	1
Q. virginiana	2325	1
Quisqualis indica	20	1
Raphiolepis Xdelacourii	447	7
R. indica	512	2
R. umbellata	193	3
Restio tetraphyllus	20	8
Rhagodia spinescens	3021	8
Rhamnus alaternus	10	1
R. purshiana	10	6
Rhapis excelsa	10	4
R. humilis	10	4
Rhododendron album	10	4
R. Xallisonjohn	249	8
R. Xaltaclerense	10	2
R. augustinii	419	8
R. Xazumakagami	77	8
R. Xbazil	53	8
R. Xbettywormald	111	8
R. Xblandyanum	10	2
R. Xbluebird	159	8
R. xbluediamond	477	8
R. Xbluepeter	371	8
R. Xbroughtonii	148	2
R. XC.B. vanness	451	8
R. XchevFdeSauv.	70	8

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		Relative Number Planted	Period introduced
R.	Xchristmasch	424	8
R.	Xcilpinense	170	8
R.	Xcornubia	249	8
R.	Xcorrykoster	16	8
R.	Xcountessofathl.	265	8
R.	Xcountessofhadding.	69	8
R.	Xcrossbill	53	8
R.	Xcynthia	6	8
R.	Xdaviesii	27	8
R.	Xdaydream	53	8
R.	Xearl of athlone	265	8
R.	Xearl of donoug	5	8
R.	Xeldorado	451	8
R.	Xelisabethh.	339	8
R.	Xelizabeth	53	8
R.	Xfabia	31	8
R.	Xfaggettersf	64	8
R.	Xfairyqueen	95	8
R.	Xfastuosum	133	2
R.	Xfragrantis.	470	8
R.	Xfurnivallsdaug.	233	8
R.	Xgeoffroymil	16	8
R.	Xgoldendream	27	8
R.	Xharvestmoon	37	8
R.	Xhelenschiff	143	8
R.	Xhybridum	10	4
R.	Ximpeditum	13	8
R.	indicum	4568	2
R.	Xiverysscar.	53	8
R.	Xjenny	27	8
R.	XJ.M.montag.	286	8
R.	kaempferi	3	6
R.	Xlamplighter	217	8
R.	Xlettyedwards	90	8
R.	Xloderi	191	8
R.	Xlordroberts	265	8
R.	Xlucdin	207	8
R.	macrophyllum	10	2
R.	magnificum	10	2
R.	maximum	30	2
R.	Xmaxskye	215	8
R.	Xmayday	181	8
R.	molle	265	4
R.	mollis	7313	1
R.	Xmounteverest	53	8
R.	XmrsC.E.pearson	164	8
R.	XmrsAtlamare	148	8
R.	XmrsECStirl.	58	8
R.	Xmrsfurnivall	133	8
R.	XmrsG.W.leak	497	8
R.	XmrsJCmillais	27	8
R.	XmrsP.D.will.	27	8
R.	Xmrsrobertson	223	8
R.	XmrsWCslocock	95	8
R.	Xmultiflorum	16	8
R.	Xnarcissifl.	3	6
R.	obtusum	12	6

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
R. Xoceanlake	101	8
R. Xpinkpearl	435	8
R. ponticum	42	2
R. Xpresidentroose.	674	8
R. Xprof.hugodevir.	9	8
R. Xpurplespl.	456	8
R. Xredrobin	106	8
R. Xrhodora	9	8
R. Xrosequeen	297	8
R. Xrutherford	877	8
R. Xsaffronqueen	451	8
R. Xsappho	345	8
R. Xseta	53	8
R. simsii	679	8
R. Xsirrobertp.	577	8
R. Xsnowlady	190	8
R. XsouvenirdeDrSend.	217	8
R. Xsusan	286	8
R. Xtallyho	111	8
R. Xtopsvoortp.	191	8
R. Xunique	233	8
R. Xunknownwar.	408	8
R. Xvan ness sensation	239	8
R. Xvolcano	191	8
R. Xwhitepearl	377	8
R. Xwinsom	186	8
Rhodomyrtus tomentosus	10	3
Rhopalostylis baueri	20	3
R. sapida	20	3
Rhus succedanea	357	3
R. typhina	100	7
R. toxicodendron	30	4
R. verniciflua	10	4
Ribes aureum	263	1
R. menziesii	51	6
R. nigrum	2151	2
R. sanguineum	641	1
R. sativum	2473	2
R. speciosum	131	1
R. uva-crispa	2776	2
Richea pandanifolia	6	8
Ricinus communis	10	4
Robinia Xambigua	10	4
R. hispida	132	1
R. neomexicana	16	4
R. pseudoacacia	2828	1
Rochea coccinea	10	2
Romneya coulteri	11	4
Rondeletia anomala	30	3
R. odorata	30	1
Rosa Xalba	10	3
R. banksiae	3941	2
R. centifolia muscosa	40	3
R. Xdamascena	10	3
R. Xfortuniana	10	2
R. Xlutea	20	3
R. odorata	20	2

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
R. roxburghii	20	2
R. rubiginosa	20	1
R. Xscentifolia	10	3
Rosmarinus eriocalix	2407	8
R. officinalis	15728	2
Rothmannia globosa	34	3
Royena lucida	10	8
Rubus idaeus	979	1
R. fruticosus	20	2
R. phoenicolasius	10	4
R. ursinus	1011	4
Ruellia graecizans	10	2
R. schauerana	10	3
Rulingia hermanniifolia	5	8
Russelia equisetiformis	20	1
Ruta graveolens	20	2
Sabal blackburniana	10	4
S. minor	10	3
S. palmetto	20	3
Salix alba	4781	4
S. Xamericana	32	5
S. babylonica	8102	1
S. Xblanda	2	6
S. caprea	1865	1
S. Xchrysocoma	298	8
S. fragilis	610	8
S. matsundana	902	7
S. purpurea	124	4
S. xrubens	34	8
S. Xrubra	10	3
S. sessilifolia	32	5
S. Xsmithiana	10	4
S. stipularis	10	3
S. viminalis	10	1
Salvia aurea	10	3
S. azurea	100	6
S. coccinea	10	2
S. grahamii	50	7
S. leucantha	50	7
S. officinalis	10	2
S. patens	20	2
S. splendens	180	1
S. ulignosa	50	7
Sambucus nigra	374	1
Sanchezia nobilis	10	3
Santolina chamaecyparissus	878	7
Sapium sebiferum	482	7
Sarcococca ruscifolia	80	8
Saxegothaea conspicua	10	2
Scaevola aemula	215	8
S. albida	814	8
S. humilis	352	8
S. macrocarpa	100	7
Schinus areira	1224	1
Schotia afra	20	1
S. latifolia	10	4
Sciadopitys verticillata	10	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Selliera radicans	360	8
Senecio crassiflorus	32	8
Sequoia sempervirens	60523	1
Sequoiadendron giganteum	705	2
Serissa foetida	10	3
Shepherdia canadensis	10	2
Solandra grandiflora	40	2
S. longifolia	10	2
Solanum capsicastrum	10	3
S. jasminoides	154	1
S. muricatum	16	8
S. seaforthianum	10	4
S. wendlandii	10	4
Sollya heterophylla	3591	2
Sophora japonica	13002	1
S. microphylla	10	4
S. tetraptera	256	1
Sorbaria grandiflora	20	1
Sorbus aucuparia	1891	4
S. domestica	854	1
S. hupehensis	66	8
S. sambucifolia	10	8
Sparmannia africana	20	2
Spartium junceum	1892	4
Sphaeropteris cooperi	47	3
S. medullaris	10	4
Spiraea Xarguta	146	8
S. bella	10	3
S. Xbumalda	370	4
S. cantoniensis	3348	3
S. chamaedryfolia	10	2
S. corymbosa	267	1
S. douglasii	235	2
S. gracilis	10	4
S. hypericifolia	10	2
S. japonica	3275	3
S. prunifolia	936	1
S. salicifolia	10	3
S. thunbergii	5355	6
S. Xvanhouttei	675	8
S. wilsonii	2	6
Spyridium praecox	100	8
Stachyurus praecox	100	8
Stenocarpus cunninghamii	40	2
S. salignus	20	4
Stenochlaena palustris	5	8
Stephanandra tanakae	715	8
Stephanotis floribunda	20	1
Stigmaphyllon ciliatum	30	2
Stranvaesia davidianna	270	7
Strelitzia alba	10	4
S. reginae	10	1
Streptosolen jamesonii	10	3
Strobilanthes anisophyllus	50	2
S. glomeratus	10	2
Strophanthus speciosus	10	4
Styrax japonicus	191	7

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
Sutherlandia frutescens	10	1
Swainsona galegifolia	196	3
S. greyana	10	2
Symphoricarpos albus	1253	2
S. orbiculatus	243	3
S. rivularis	129	7
Syncarpia glomulifera	10	2
Syngonium macrophyllum	114	8
S. standleyanum	18	8
Syringa afghanica	5	8
S. oblata	1	6
S. xperisca	29	1
S. villosa	3	6
S. vulgaris	2614	1
S. wolfii	5	8
Syzygium floribundum	1	8
S. jambos	40	3
S. malaccense	10	2
S. paniculatum	40	2
Tabebuia heptaphylla	10	2
Tabernaemontana divaricata	20	3
Taiwania cryptomerioides	6	8
Tamarindus indica	10	3
Tamarix chinensis	1064	3
T. gallica	373	2
T. parviflora	95	8
T. tetrandra	65	7
Taxodium distichum	624	1
Taxus baccata	1679	1
Tecoma alata	10	4
T. fulva	10	3
T. stans	40	1
Tecomaria capensis	10	1
Telopea mongaensis	324	7
T. oreades	120	7
T. speciosissima	365	1
T. truncata	116	6
Tetrapanax papyrifera	20	2
Tetratheca ericifolia	100	7
Teucrium flavum	207	8
T. fruticans	1680	7
T. marum	60	8
Thomasia petalocalyx	20	8
Thryptomene calycina	78	8
T. saxicola	686	8
Thuja occidentalis	8762	2
T. plicata	1163	2
Thujopsis dolabrata	281	2
Thunbergia alata	10	1
T. coccinea	30	2
T. erecta	20	2
T. grandiflora	10	3
T. gregorii	12	6
T. laurifolia	40	2
Thymus Xcitriodorus	102	8
T. herba-barona	163	7
T. richardii	40	7

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
T. serpyllum	638	7
T. vulgaris	468	2
Thryptomene calycina	150	7
T. Xpaynee	60	8
Tibouchina heteromalla	10	2
T. laxa	20	3
T. urvilleana	10	3
Tilia cordata	1328	7
T. Xeuropaea	161	1
T. platyphyllos	20	4
T. tomentosa	3	5
Todea barbara	10	3
Toona australis	70	2
Torreya californica	20	2
Trachelospermum jasminoides.	6375	2
Trachycarpus fortunei	14	4
Tristania conferta	30	2
Tsuga canadensis	78	7
T. heterophylla	21	8
Tweedia coerulea	10	1
Ugni molinae	21	2
Ulex europaeus	2319	2
Ulmus americana	3233	5
U. canescens	162	5
U. carpinifolia	287	5
U. glabra	196	2
U. Xhollandica	117	4
U. parvifolia	6805	1
U. procera	8407	1
U. pumila	649	8
U. Xvegeta	915	4
Vaccinium corymbosum	540	8
Verticordia brownii	10	3
Viburnum acerifolium	2	6
V. Xburkwoodii	5538	6
V. bitchiuense	1	6
V. carlcephalum	144	8
V. carlesii	2820	6
V. davidii	379	7
V. farreri	125	8
V. japonicum	293	1
V. macrocephalum	257	1
V. obovatum	10	1
V. odoratissimum	10	1
V. opulus	4018	1
V. plicatum	3021	1
V. rigidum	30	1
V. sieboldii	10	4
V. suspensum	145	2
V. tinus	11832	1
Vigna caracalla	10	4
Viminaria juncea	120	8
Vinca major	8093	1
V. minor	7269	1
Virgilia capensis	812	1
V. divaricata	88	8
Vitex agnus-castus	430	1

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

	Relative Number Planted	Period introduced
V. negundo	15	8
V. trifolia	13	4
Vitis coignetiae	41	6
V. labrusca	70	4
V. thunbergia	10	4
V. vinifera	15979	1
Washingtonia filifera	37	4
W. robusta	47	8
Weigela Xbristolruby	24	7
W. coraeensis	51	2
W. floribunda	398	6
W. florida	4588	1
W. hortensis	10	3
W. praecox	1503	8
W. Xstyriaca	2	6
Weinmannia sylvicola	50	8
Westringia brevifolia	191	8
W. fruticosa	11132	7
W. glabra	206	7
W. longifolia	577	7
W. rosmariniformis	556	8
W. rubiifolia	47	8
W. xwynyabbie gem	48	8
Widdringtonia cupressoides	20	3
W. juniperoides	30	2
Wigandia caracasana	10	4
W. urens	10	4
Wisteria brachybotrys	20	4
W. floribunda	1234	4
W. frutescens	10	1
W. macrostachya	20	3
W. megasperma	10	3
W. sinensis	1889	1
Xanthoceras sorbifolium	1	6
Xylosma japonica	20	8
Yucca aloifolia	30	1
Y. filamentosa	496	1
Y. gloriosa	142	1
Y. louisianensis	22	8
Y. recurvifolia	10	4
Zelkova serrata	3143	7
Zenobia pulverulenta	45	8

(1=<1851, 2=1851-1870, 3=1871-1890, 4=1891-1910, 5=1911-1930, 6=1931-1950, 7=1951-1970, 8>1970)

APPENDIX 5:Synonym and unidentified names used in the 150 catalogues studied for Adelaide (ade), Melbourne (melb) and Sydney (syd).

Abelia 'edward Goucher' = Abelia Xgrandifolia
Abelia hendersoni? ade,24,32,33,39
Abelia Keats golden? melb,48,50
Abelia longituba = Abelia schumanni
Abelia rupestris = Abelia chinensis
Aberia caffra = Dovyalis caffra
Abies arozonica = Abies lasiocarpa
Abies bermundiana? syd8,10 melb?3
Abies brachyphylla = Abies homolepis
Abies Brunoniana = Tsuga dumosa
Abies canadensis = Picea glauca
Abies coerulea = Picea glauca
Abies communis? syd4,7,15
Abies douglasii = Pseudotsuga menziesii
Abies engelmanii = Picea engelmannii
Abies excelsa = Picea abies
Abies glutinosa? melb7
Abies hanburyana = Tsuga sieboldii
Abies kaemkaempferli = Pseudolarix amabilis
Abies khutrow = Picea morinda
Abies Kosteriana glauca = Picea pungens
Abies macrocarpa? melb17
Abies menziesii = Pseudotsuga menziesii
Abies mertersiana = Tsuga heterophylla
Abies morinda = Picea smithiana
Abies nigra = Picea mariana
Abies nobilis = Abies procera
Abies orientalis = Picea orientalis
Abies parryana = Picea pungens
Abies pectinata = Abies alba
Abies pungens = Picea pungens
Abies rubra = Picea rubens
Abies smithiana = Picea abies
Abies williamsoni = Tsuga mertensiana
Abrobra viridiflora = Abrobra tenuifolia
Abroma augusta? syd2
Abutilon andenkennan bonn? melb,20,22 ade,24
Abutilon auguste paswald? syd15,17,19 melb?6 ade?12,18,20
Abutilon aurea globosa? ade,12,38
Abutilon aureum variegatum = Abutilon pictum
Abutilon berrenger? syd12 melb?7
Abutilon brillant? melb,25,26,46 ade,29,33,34,38,44
Abutilon carmine? syd43
Abutilon cloth of gold? syd21,26,29,30,(42) melb?18
Abutilon conquette? ade,20,24
Abutilon defience? melb,36
Abutilon driven snow? melb,25,26,29 ade,20,24
Abutilon duc de malakoff? syd12,20 melb?5,6,7,8,9,11,18,27
ade,12,20,24,29,32,33
Abutilon eclipse = Abutilon Xhybridum
Abutilon elegans? ade,12
Abutilon emperor = Abutilon vesuvius
Abutilon firefly? ade,20,24
Abutilon fireking? ade,12
Abutilon fleur de neige? melb18
Abutilon floribunda? ade,12,
Abutilon Hero of magdala? syd,23, melb,18,25,26
Abutilon I.B. levis? melb,20,22
Abutilon jubilee?43
Abutilon lady of the lake? syd20 melb?6,18,25,26,33 ade,12,

Abutilon lilaceum syd,27, melb,18,25,26,29
Abutilon louis van houttee syd18 melb?5,6
Abutilon luteum erectum? ade,12
Abutilon malvaeflorum? ade,12
Abutilon marmorata = Abutilon sellovianum
Abutilon miniatum? ade,12
Abutilon niveum? ade,12
Abutilon orange king = Abutilon vitifolium
Abutilon prince of orange? syd15,19
Abutilon richesse? melb,20,22
Abutilon rosaeflorum = Abutilon pictum
Abutilon savitzii = Abutilon Xhybridum
Abutilon scarlet gem? syd,26,27, melb,18,20,22
Abutilon seraph?,20,22
Abutilon souvenir de Bonn = Abutilon Xhybridum
Abutilon souvenir de Prince Albert? ade 26,29,32,33,34
Abutilon striatum = Abutilon pictum
Abutilon Sydney belle? syd,36,41,42 melb,25,26,27,29,33,34,36,37,38,39,46,
Abutilon Thompsonii = Abutilon pictum
Abutilon tunisia? ade,38
Abutilon van houttii? melb,20, ade,12,
Abutilon vexillarium = Abutilon megapotamicum
Abutilon violet queen? melb,20,22,25,26,29
Acacia abietina = Acacia linearis
Acacia acicularis = Acacia juniperina
Acacia aestivalis? melb,29,
Acacia albicans = Trypithecolobium albicans
Acacia amona = Acacia rubida
Acacia angustifolia = Acacia longifolia
Acacia arabica = Acacia nilotica
Acacia argophylla = Acacia brachybotrya
Acacia bakeri? melb,33,
Acacia botrycephala = Acacia terminalis
Acacia Brownii = Acacia juniperina
Acacia burkitti? ade,46,
Acacia celastrifolia = Acacia myrtifolia
Acacia clavata = Acacia montana
Acacia crassiuscculea? syd6 melb,22,
Acacia cupressoides? syd5
Acacia cyanophylla = Acacia saligna
Acacia discolor = Acacia panniculata
Acacia elata = Acacia terminalis
Acacia exsudans = Acacia verniciflua
Acacia formosa? melb,22,
Acacia glauca = Leucaena glauca
Acacia grandiflora(Calliandra Grandiflora)? syd6
Acacia hispida rosea = Robinia hispida
Acacia julibrissin = Albizia julibrissin
Acacia latisiliqua = Lysiloma latisiliqua
Acacia latrobeli = Acacia acinacea
Acacia linearis = Acacia longissima
Acacia lophantha = Albizia distachya
Acacia lophanthoides? syd6
Acacia maritima = Acacia panniculata
Acacia megaphylla = Acacia anceps
Acacia miafolia? melb,33,
Acacia mimosa? melb,26,
Acacia mollisima = Acacia mearnsii
Acacia mucronata = Acacia longifolia
Acacia nematophylla = Acacia calamifolia
Acacia nemu = Albizia julibrissin
Acacia neriifolia = Acacia iteaphylla
Acacia normalis = Acacia decurrens
Acacia ornithophora = Acacia armata
Acacia parvissima = Acacia pravissima
Acacia pinifolia = Acacia juncifolia

Acacia praemosa? syd6
Acacia pseudoacacia = Robinia pseudoacacia
Acacia roxburghiana? syd21
Acacia ruscifolia = Acacia juniperina
Acacia rutaefolia = Acacia nigricans
Acacia salicifolia? melb,24, ade,18,
Acacia sertiformis = Acacia undulifolia
Acacia sophora = Acacia longifolia
Acacia sowdenii = Acacia papyrocarpa
Acacia undulata = Acacia armata
Acacia venusta = Calliandra portoricensis
Acacia vera = Acacia nilotica
Acacia verticilata = Acacia juniperina
Acacia:rose = Robinia hispida
Acalypha brilliant syd40
Acalypha brownii? syd16,18,31 ade,13,
Acalypha gloria syd40
Acalypha macleayii? syd16 ade,13,
Acalypha magnifica syd40
Acalypha marginata = Acalypha wilkesiana
Acalypha metallica? syd(43)
Acalypha musaica = Acalypha wilkesiana
Acalypha sanderana = Acalypha hispida
Acalypha tricolor = Acalypha wilkesiana
Acanthus spinosus = Acanthus spinosissimus
Acer albo variegatum = Acer pseudoplatanus
Acer argentea variegata = Acer negundo
Acer colchicum = Acer cappadocicum
Acer dasycarpum = Acer saccharinum
Acer drummondii = Acer rubrum
Acer floridanum = Acer barbatum
Acer fraxinifolium = Acer negundo
Acer lacinatum = Acer japonicum
Acer leopoldi = Acer pseudoplatanus
Acer mono = Acer truncatum
Acer neapolitana = Acer opalus
Acer opulifolium = Acer opulus
Acer polymorhum = Acer palmatum
Acer purpurea = Acer palmatum
Acer schwedlerii = Acer platanoides
Acer seigan = Acer palmatum
Acer trifidum = Acer buergeranum
Acer virginicum = Acer saccharinum
Achras australis = Planchonella australis
Achras sapato = Manilkara zapota
Achyranthes canescens? syd5
Acmena elliptica = Acmena smithii
Acmena floribunda = Acmena smithii
Acmena kingiana = Acmena smithii
Acmena myrtifolia = Syzygium paniculatum
Acmena pendula = Syzygium floribundum
Acokanthera spectabilis = Acokanthera oblongifolia
Acrocarpus combretiflora? syd12
Acronychia laevis = Acronychia oblongifolia
Acrostichum appendiculatum = Egenofolia appendiculata
Acrostichum drynariodes? ade,18,
Actinotus = HERB
Adamia cyane = Dichroa febrifuga
Adamia versicolor = Dichroa febrifuga
Adenocarpus tubensis? melb3
Adhatoda cydonaefolia = Justica cydonaefolia
Adhatoda duvernoia = Duvernoia adhatodoides
Adhatoda vassica = Justicia adhatoda
Adhatoda ventricosa? melb5,7
Adiantum = HERB
Admantha microsperma? syd12

Aechma = HERB
Aeschynanthus grandiflorus = Aeschynanthus parasiticus
Aeschynanthus major? syd8
Aeschynanthus rammossimma = Aeschynanthus parasiticus
Aeschynanthus volubilis? syd4,7 melb?3
Aeschynanthus zebrina = Aeschynanthus marmorata
Aesculus briotii = Aesculus Xcarnea
Aesculus flava = Aesculus octandra
Aesculus rubicunda = Aesculus Xcarnea
Agathea colestris = Felicia amelloides
Agathoma microphylla? syd5
Agathosma villosa = Agathosma corymbosa
Agave filamentosa = Agave filifera
Agave glaucescens = Agave attenuata
Agave mexicana = Agave picta
Agave seemeni = Agave seemanniana
Agave verschaffelti = Agave potatorum
Ageratum = HERB
Agnostus = Stenocarpus
Agti grandiflora = Sesbania grandiflora
Ailanthus glandulosa = Ailanthus altissima
Akebia lobata = Akebia trifoliata
Alantodea australis = Diplazium australe
Alantodea ternea? syd5
Albizia littoralis? syd12
Albizia lophantha = Albizia distachya
Albizia pruinosa = Pithecellobium pruinosa
Aleurites triloba = Aleurites moluccana
Allamanda aubletii = Allamanda cathartica
Allamanda grandiflora = Allamanda cathartica
Allamanda hendersonii = Allamanda cathartica
Allamanda nobilis = Allamanda cathartica
Allamanda pubescens = Allamanda cathartica
Allamanda schottii = Allamanda cathartica
Allamanda wardlyana = Allamanda cathartica
Alnus capensis? syd15,17,18,19,21
Alnus laciniata = Alnus incana
Alocasia ilustris = Colocasia esculenta
Alocasia metalillica = Alocasia indica
Aloe angula? ade,13,
Aloe attenta = Haworthia attenuata
Aloe flava = Aloe barbadensis
Aloe frutescens = Aloe arborescens
Aloe fulgens = Aloe Xprincipis
Aloe hanburiana = Aloe striata
Aloe margartitia = Haworthia margaritifera
Aloe mili? ade,32,33,
Aloe patens ade,9,13,20,
Aloe prolifera = Aloe brevifolia
Aloe pseudo-ferox = Aloe ferox
Aloe pulchella? melb7 ade,9,13,
Aloe small pual? syd1
Aloe socotrina = Aloe succotrina
Aloe spiral? syd1
Aloe thick leaved tongue? syd1
Aloe umbellata = Aloe saponaria
Aloe vulgaris = Aloe barbadensis
Alonsia coccinea? ade,12,
Aloysia bergamont = Aloysia triphylla
Aloysia citriodora = Aloysia triphylla
Alpinia nutans = Alpinia zerumbet
Alsophila cooperi = Sphaeropteris cooperi
Alsophila grande = Sphaeropteris cooperi
Alsophila macatheruri = Alsophila leichlardtiana
Alyxia daphnoides? syd8,12,13, ade,24,32,33,
Alyxia gynopogon(lucida)? syd5

Alyxia tetragonia = Alyxia spicata
Amorpha lewisii = Amorpha fruticosa
Amorpha sellowi? syd8
Ampelopsis dissecta = Ampelopsis aconitifolia
Ampelopsis royals = Parthenocissus quinquefolia
Amphelopsis alicante bouchet = Vitis amurensis
Amphelopsis englemanii = Parthenocissus quinquefolia
Amphelopsis hederacea = Parthenocissus quinquefolia
Amphelopsis henryana = Parthenocissus henryana
Amphelopsis hirsutum = Parthenocissus quinquefolia
Amphelopsis hoggii = Parthenocissus tricuspidata
Amphelopsis japonica = Parthenocissus tricuspidata
Amphelopsis lowii = Parthenocissus tricuspidata
Amphelopsis muralis = Parthenocissus quinquefolia
Amphelopsis pubescens = Parthenocissus quinquefolia
Amphelopsis quinquedolia = Parthenocissus quinquefolia
Amphelopsis radicantissima? ade,18,24,
Amphelopsis sempervirens = Cissus striata
Amphelopsis sieboldtii = Vitis thunbergii
Amphelopsis veitchii = Parthenocissus tricuspidata
Amygdalus communis = Prunus dulcis
Andromeda arboreum = Oxydendrum arboreum
Andromeda axillaris = Leucothoe axillaris
Andromeda buxifolia = Agauria buxifolia
Andromeda calyculata = Chamaedaphne calyculata
Andromeda catesbaei = Leucothoe fontanesiana
Andromeda chandleri? melb,48,
Andromeda floribunda = Pieris floribunda
Andromeda forrest = Pieris forrestii
Andromeda japonica = Pieris japonica
Andromeda mariana = Lyonia mariana
Andromeda paniculata = Lyonia ligustrina
Andromeda phillyreifolia = Pieris phillyreifolia
Andromeda rupestrus = Gaultheria antipoda
Andromeda speciosa = Zenobia pulverulenta
Aneilema = HERB
Anenandra capitata? syd5
Anenandra uniflora? syd5
Angophora lanceolata = Angophora costata
Angophora melanoxylon? syd42
Anona triloba = Asimina triloba
Anthericum = HERB
Anthonis pictinata ade,12
Anthurium = HERB
Antidesma paniculata? syd4
Antigonum amabile? syd18
Aotus villosa = Aotus ericoides
Aphelandra cristata = Aphelandra tetragona
Aphelandra dania = Aphelandra squarrosa
Aphelandra Gheisbrechtii = Justicia ghiesbreghtiana
Aphelandra Leopoldi = Aphelandra squarrosa
Aphelandra roezlii = Aphelandra aurantiaca
Apophyllum anumalum? syd42
Aralea chabrierii = Elaeodendron orientale
Aralia bernaysiana? syd15,16,18 ade,13,18,24,
Aralia crassifolia = Pseudopanax crassifolium
Aralia elegans = Dizygotheca elegantissima
Aralia elegantissima = Dizygotheca elegantissima
Aralia ficifolia = Polyscias filicifolia
Aralia gigantea? syd12
Aralia guilfoylei = Polyscias guilfoylei
Aralia japonica = Fatsia japonica
Aralia longissima? ade,7,24,
Aralia maculata? ade,18,
Aralia monstrosa? ade,16,18,24,
Aralia papriferus = Tetrapanax papriferus

Aralia parvifolia? ade,7,13,
Aralia pentaphylla = Acanthopanax spinosum
Aralia reticulata = Oreopanax reticulatus
Aralia schefferi = Schefflera digitata
Aralia schomburgiana? syd15,16,18
Aralia sheperdiana? syd15,16 ade,13,
Aralia sieboldii = Fatsia japonica
Aralia trifoliata = Pseudopanax crassifolium
Aralia veitechi = Dizygotheca veitchii
Araucaria braziliana = Araucaria angustifolia
Araucaria cooki = Araucaria columnaris
Araucaria excesla = Araucaria heterophylla
Araucaria gluaca = Araucaria cunninghamii
Araucaria imbricata = Araucaria araucana
Araucaria macleayana? syd4,7
Araujia elegans? melb,46,
Arbutus coccinea? syd8,10 ade,12
Arbutus photinifolia? syd7
Arbutus rosea? syd12
Arctostaphylos arbutiodes? ade,12
Ardemea coerulea? melb3
Ardisia crenulata = Ardisia crenata
Ardisia lutea = Ardisia crenata
Arduina bispinosa = Carissa bispinosa
Areca baueri = Rhopalostylis baueri
Areca lutescens = Chrysalidocarpus lutescens
Areca monostachya = Linospadix monostachya
Areca rubra = Dictyosperma album
Areca sapida = Rhopalostylis sapida
Argodendron trifoliata = Stenocarpus sinuatus
Aristolochia cliata = Aristolochia fimbriata
Aristolochia gigantea = Aristolochia grandiflora
Aristolochia glauca? melb9
Aristolochia sipho = Aristolochia durior
Aronia floribunda = Aronia prunifolia
Artabotrys odaratissima = Artabotrys hexapetalus
Artemisia argentea = Artemisia arborescens
Artemisia judaica? ade,8,
Arthurium giganteum? melb2
Artocarpus integrifolia = Artocarpus integrifolia
Arundinara gracilis = Bambusa gracilis
Arundinaria falcata = Chimonobambusa falcata
Arundinaria japonica = Pseudosasa japonica
Arundo charlwoodii? melb5
Arundo conspicua = Cortaderia richardii
Arundo plumosa (Toi Toi NZ plumegrass)? ade,16,
Arundo variegata = Arundo donax
Asclepias nivea = Asclepias exaltata
Asparagus camoriensis = Asparagus setaceus
Asparagus capensis? syd26,27,30 melb,25,26,28 ade,7,18,20,22,24,26
Asparagus consanguineus? syd 27, melb18,20,21,23,25,26, ade,13,18,
Asparagus decumbens = Asparagus crispus
Asparagus myerii = Asparagus densiflorus
Asparagus myrtifolia = Asparagus asparagoides
Asparagus plumosus = Asparagus setaceus
Asparagus sprengeri = Asparagus densiflorus
Asparagus strigosa? ade,13,18,
Asparagus tenuissima = Asparagus densiflorus
Aspidistra lurida = Asparagus elatior
Aster aculeatus = Olearia ramulosa
Aster argophyllus = Olearia argophylla
Aster filifera? ade,33,
Aster fruticulosus = Felicia fruticosa
Aster liratus = Olearia stellulata
Aster luteus? melb,33,
Aster majorie? melb,33,

Aster tomentosus = Olearia tomentosus
Astrapea wallichii = Dombeya wallichii
Athrotaxis juniperoides? syd5
Aucuba femina = Aucuba japonica
Aucuba limbata = Aucuba japonica
Aucuba longifolia = Aucuba japonica
Aucuba macrophylla = Aucuba japonica
Aucuba mascula = Aucuba japonica
Aucuba sulphurea? melb,46,
Audibertia incana = Salvia clovrii
Azalea = Rhododendron
Baeckia micropylla = Micromyrtus ciliatus
Balfouria pittosporiodes? syd10,12,18,20 ade,12,
BAMBOO PRYRAMIDICAL? syd1
BAMBOO TALL RED? syd1
BAMBOO YELLOW? syd1
BAMBOO: DRAWF? SYD1
Bambusa agrestis? ade,18,24,
Bambusa alphonse karri = Bambusa glaucescens
Bambusa arundinaria japonica = Pseudosasa japonica
Bambusa arundinaria japonica = Pseudosasa japonica
Bambusa aurea = Phyllostachys aurea
Bambusa auricoma = Arundinaria viridi-striata
Bambusa bungo sasa? melb,21,22,
Bambusa castillionis = Phyllostachys bambusoides
Bambusa communis = Phragmites australis
Bambusa falcata = Chimonobambusa falcata
Bambusa fortunei variegata = Arundinaria variegata
Bambusa gomatata = Dendrocalamus strictus
Bambusa heterocycla? ade?,24,
Bambusa humilis = Bambusa vulgaris
Bambusa japonica = Pseudosasa japonica
Bambusa japonica = Pseudosasa japonica
Bambusa kaisyana? ade,24,
Bambusa marmorea = Chimonobambusa marmorea
Bambusa mitis = Phyllostachys bambusoides
Bambusa nana = Arundinaria disticha
Bambusa nigra = Phyllostachys nigra
Bambusa palmata = Sasa palmata
Bambusa puberulea = Phyllostachys nigra
Bambusa pubescens = Dendrocalamus strictus
Bambusa quadrangularis = Chimonbambussa quadrangularis
Bambusa quiloi = Phyllostachys quiloi
Bambusa ruscifolia = Shibataea kumassa
Bambusa steris? melb18
Bambusa stricta = Bambusa vulgaris
Bambusa sua chiko? ade,18,
Bambusa tricolor? melb18
Bambusa veitchi = Sasa veitchii
Bambusa viminalis = Shibataea kumasaca
Bambusa virdis? ade24
Banadesa rosea? syd8
Banksia australis = Banksia marginata
Banksia burdettii? melb,40, ade,40,46,
Banksia hookerii = Banksia solanderi
Banksia latifolia = Banksia robur
Banksia praemosa = Banksia marcescens
Banksia prionophylla = Banksia collina
Banksia rosea alba? syd,45,
Banksia white honeysuckle,49,
Bannana common = Musa Xparadisiaca
Bannana drawf = Musa acuminata
BANYAN = Ficus benghalensis
BARCEOLONA NUT = Corylus avellana
Barleia coerulea = Barleria strigosa
Barnadesa rosea? syd,12,

Barnadesa spinosa ade,12
Bauera galegefolia? syd2
Bauera humilis = Bauera rubioides
Baueriana repens = Coprosma repens
Bauhinia alba = Bauhinia variegata
Bauhinia arborea? syd12
Bauhinia Galpinii = Bauhinia punctata
Bauhinia longipes = Bauhinia reniformis
Bauhinia microphyll? melb3
Bauhinia parviflora = Bauhinia racemosa
Bauhinia pubescens = Bauhinia aculeata
Bauhinia richardiana? syd47(mauritius)
Beaufortia speciosa? melb7
Beckia plicata = Micromyrtus ciliata
Beckia plicata = Micromyrtus ciliatus
Begonia aculitii = Begonia maculata
Begonia andermusa? ade,6,
Begonia argyrea? syd16,17
Begonia argyrostigma = Begonia maculata
Begonia carnea? syd36,41,(43)
Begonia daedalia = Begonia strigillosa
Begonia discolor = Begonia grandis
Begonia duc de brabant? syd16,18 melb?7,11 ade?,9,
Begonia duchess? syd1618
Begonia excelsa? ade,9,
Begonia floribunda = Begonia foliosa
Begonia fuschioides = Begonia foliosa
Begonia longipes = Begonia reniformis
Begonia lucerna = Begonia corallina
Begonia marshalli? melb5,7,8,11 ade,6,
Begonia meyersii = Begonia tomentosa
Begonia nitida = Begonia odorata
Begonia opuliformis? melb5,11
Begonia richardsiana = Begonia suffruticosa
Begonia snowflake? syd41
Begonia spotted leapord? syd41
Begonia taylorii? melb5,8
Begonia zebrina = Begonia stipulacea
Beloperone guttata = Justicia brandegeana
Benthamia fragifera = Cornus capitata
Berberis aquifolia = Mahonia aquifolium
Berberis aristata = Berberis floribunda
Berberis asiaticus = Berberis hookeri
Berberis asperma = Berberis vulgaris
Berberis atropurpurea = Berberis vulgaris
Berberis autumn cheer = Berberis Xcarminea
Berberis bealei = Mahonia bealei
Berberis buxifolia = Berberis dulcis
Berberis communis = Berberis vulgaris
Berberis coryi = Berberis wilsoniae
Berberis crataegina = Berberis vulgaris
Berberis Ehrenbergi? melb7 ade,12,
Berberis fascicularis = Mahonia pinnata
Berberis fortunei = Mahonia fortunei
Berberis illicifolia = XMahoberberis neubertii
Berberis japonica = Mahonia japonica
Berberis keteleeri? syd,45,
Berberis latifolia = Berberris vulgaris X Mahonia aquifolium
Berberis leschenaultii = Mahonia napaulensis
Berberis little favourite = Berberis thunbergii
Berberis macrophylla = Berberis hookeri
Berberis moseri? ade,36,
Berberis nepaulensis = Berberis vulgaris
Berberis officinalis? syd8
Berberis polyantha = Berberis prattii

Berberis priate king = Berberis Xcarminea
Berberis repens = Mahonia repens
Berberis sinensis = Berberis thunbergia
Berberis subcaulialata = Berberis wilsoniae
Berberis taylorii = Berberis pratii
Berberis walcherii = Berberis hookeri
Berberis Xneuberti = Berberis vulgaris X Mahonia aquifolium
Betula alba = Betula pendula
Betula excelsa? ade,12,
Betula japonica = Betula platyphylla
Betula laciniata = Betula pendula
Betula lutea = Betula alleghaniensis
Betula populifera = Betula pendula
Betula pyramidalis = Betula pendula
Betula szechuanica = Betula platyphylla
Betula urticaefolia = Betula pubescens
Betula verrucosa = Betula pendula
Bignonia alba lutea? melb,29,31,33,35,37,
Bignonia australis = Pandorea pandorana
Bignonia bungeana? melb7 ade,12,
Bignonia capensis = Tecomaria capensis
Bignonia capreolata = Doxantha capreolata
Bignonia catalpa = Catalpa syringaefolia
Bignonia chamberlaynii = Anemopaegma chamberlaynii
Bignonia chelsonii? ade,7,24,
Bignonia cherere = Distictis buccinatoria
Bignonia excelsa? syd,15,17,18,19,20,21,26,27,29,31,41,
melb,20,22,24,25,26,27,28,29 ade,13,18,
Bignonia exoleta? syd,36,
Bignonia floribunda = Campsis radicans
Bignonia gracilis = Macfadyena unguis-cati
Bignonia grandiflora = Campsis grandiflora
Bignonia guilfoylei = Campsis Xguilfoylei
Bignonia hybrida grandiflora = Campsis Xguilfoylei
Bignonia jasminoides = Pandorea jasminoides
Bignonia kaempferi? syd13
Bignonia latrobei = Pandorea pandorana
Bignonia lindleyana = Clytostoma callistegioides
Bignonia lutea? ade,4
Bignonia mackenii = Podranea ricasoliana
Bignonia maden galen = Campsis radicans
Bignonia magnifica = Saritaea magnifica
Bignonia mangelsi? ade 32,33,36,
Bignonia mexicano? syd,27,
Bignonia mollie = Tecoma stans
Bignonia mon petitt? melb,25,26,29 ade,32,33
Bignonia ornata? ade,12
Bignonia picta = Clytostoma callistegioider
Bignonia pulchra? ade,13,18
Bignonia radicans = Campsis radicans
Bignonia Reginae Sabaea = Podranea brycei
Bignonia rosea(Mackenii in 1935) = Pandorea pandorana
Bignonia speciosa = Clytostoma callistegioides
Bignonia sweetiana? syd13
Bignonia thunbergia? melb,29,
Bignonia Tweediana = Macfadyena unguis-cati
Bignonia venusta = Pyrostegia venusta
Billardiera fruticosa? syd5 ade,16,20
Billardiera mutabilis = Billardiera scandens
Biota meldensis = Platycladus orientalis
Biota recurva = Platycladus orientalis
BLACKBERRY HIMALAYAN? syd40 MELB 9,11,14,18,22,23,24,26,27,29,
ade,13,18,20,24
BLACKBERRY ITALIAN? melb14,18,22,23,26,32,36,
BLACKBERRY LAUGHTON? syd40 melb,22,23,26, ade,13,18,24,

Blechnum gilliesi? melb6 ade,9,13,16,18
Blechnum ligulari? syd17 ade,9
Blechnum striatum = Blechnum serrulatum
Blechnun laevigatum? syd13,15,16,19
Bocconia japonica = Macleaya cordata
Bocconia microcarpa = Macleaya microcarpa
Boronia dentata? ade,42
Boronia exalata? melb,33
Boronia lutea = Boronia megastigma
Boronia triphylla = Boronia ledifolia
Bossiaea microphylla = Bossiaea obcordata
Botryodendron latifolium = Meryta latifolia
Botryodendron reticulatum = Meryta denhamii
Bougainvillea brazillensis = Bougainvillea spectabilis
Bougainvillea conspicua? syd,26,27
Bougainvillea cypheri = Bougainvillea glabra
Bougainvillea grandiflora? syd,26,27,39,43
Bougainvillea hessiana? syd19,21,26,27 ade,13,
Bougainvillea intermedia? melb,24,
Bougainvillea lateritia = Bougainvillea spectabilis
Bougainvillea louis wathen = Bougainvillea Xbuttiana
Bougainvillea magnifica = Bougainvillea glabra
Bougainvillea marginata = Bougainvillea glabra
Bougainvillea Mrs Butt = Bougainvillea Xbuttiana
Bougainvillea pagoda pink? ade,48,
Bougainvillea rosea = Bougainvillea spectabilis
Bougainvillea sanderiana = Bougainvillea glabra
Bougainvillea speciosa = Bougainvillea spectabilis
Bougainvillea splendens = Bougainvillea spectabilis
Bougainvillea Thomasii = Bougainvillea spectabilis
Boussingaultia baselloides = Anredera cordifolia
Bouvardia alba? melb11
Bouvardia bockii? ade,20,24
Bouvardia countess of hoptoun? ade,20,24,
Bouvardia Humboldti corymbiflora = Hedyotis purpurea
Bouvardia jacquini = Bouvardia ternifolia
Bouvardia laevigata? syd4,7
Bouvardia laura? melb18
Bouvardia lemoine? ade,24,
Bouvardia longifolia = Hedyotis purpurea
Bouvardia mable poster? ade,24,
Bouvardia oriana? syd15,16,17,19
Bouvardia oriflamme? syd17,18,19 ade,9
Bouvardia president cleveland? ade,20,24,
Bouvardia splendens = Bouvardia tenifolia
Bouvardia triphylla = Bouvardia tenifolia
Bouvardia umbellata? syd17,18 melb?18 ade,9
Bouvardia van houtte? syd15,16,18,19 melb?18
Bouvardia vreelandii = Bouvardia xdavisoni
Bouvardia Xpriory beauty? melb,37, ade,20,24
Box thorn (african) ade,15,17,18,19,22,23,
Brachychiton diversifolia = Brachychiton populneus
Brachychiton flammum = Brachychiton acerifolius
Brachychiton heterophyllum = Brachychiton populneus
Brachychiton luridus = Brachychiton discolor
Brahea filamentosa = Washingtonia filifera
Brahea glauca = Brahea armata
Brahea robusta = Washingtonia robusta
Brahea roezii = Brahea armata
Brahea sonorae = Washingtonia robusta
Bridgesia spicta = Ercilla spicta
BROOM rushleaved and white? ade,5
Browalia jamesonii = Streptosolen jamesonii
Browalia roezli = Browalia grandiflora
Browallia macrantha? melb,30
Brugmansia bicolor = Brugmansia sanguinea

Brugmansia knightii = Brugmansia arborea
Brugmansia purpurea? syd4,7,8,
Brunfelsia confertifolia = Brunfelsia calycina
Brunfelsia lindenii = Brunfelsia pauciflora
Brunfelsia montana? melb3
Brunfelsia pohliana = Brunfelsia acuminata
Brunia ericoides? syd2
Buddleia filifolia? syd6
Buddleia heterophylla = Buddleia madagascariensis
Buddleia ille de france = Buddleia davidii
Buddleia magnifica = Buddleia davidii
Buddleia mexicana? syd6
Buddleia nanhoensis = Buddleia davidii
Buddleia neemda = Buddleia asiatica
Buddleia panniculata = Buddleia crispa
Buddleia royal purpurea = Buddleia davidii
Buddleia salicifolia = Chilianthus oleaceus
Buddleia variabilis = Buddleia davidii
Buddleia veitchiana = Buddleia davidii
Buginvilla = Bougainvillea
Burchellia capensis = Burchellia bubalina
Buxus arborescens = Buxus sempervirens
Buxus aurea varigata = Buxus sempervirens
Buxus baccata? ade,13,18,24,
Buxus elegantissima = Buxus sempervirens
Buxus latifolia = Buxus sempervirens
Buxus longifolia = Buxus sempervirens
Buxus suffruticosa = Buxus sempervirens
Bystropogon teterifolia? ade,35,39,
Cacalia ficoides = Senecio ficoides
Cactus chiliensis = Trichocereus chiloensis
Cactus conway's giant? ade,5,
Cactus curassavica = Opuntia curassavica
Cactus flagelliformis = Aporocactus flagelliformis
Cactus jenkinsonii? syd8,13
Cactus latifrons = Epiphyllum oxypetalum
Cactus loweii? syd8
Cactus mallisoni = XHeliaporos smithii
Cactus otonia? syd8
Cactus quadrangularis = Acanthocereus pentagonus
Cactus speciosimus = Heliocereus speciosus
Cactus triangularis = Hylocereus triangularis
Calampelis scabra = Eccremocarpus scabra
Calceolaria fruticosa? ade,7,13,18,24
Calceolaria pumila? syd16 melb,21,
Calceolaria rigens? syd4
Calceolaria violacea = Jovellana violacea
Calistegia pubescens = Calystegia hederacea
Calliandra hirsuta? melb,33,
Calliandra tweedii = Inga pulcherrima
Callicarpa Giraldiana = Callicarpa bodinieri
Callicarpa macrophylla? melb3,5,7 ade,12,
Callicarpa purpurea = Callicarpa dichotoma
Callicarpa rosea? syd8,17,21
Callipteris malabarica? melb,20,22
Callipteris prolifera = Diplazium proliferum
Callistachys ovata = Oxylobium callistachys
Callistemon acerosus = Callistemon brachyandrus
Callistemon acunata? ade,39,
Callistemon arborescens = Callistemon pinifolius
Callistemon candy pink? melb,50,
Callistemon "Captain Cook" = Callistemon viminalis
Callistemon coccineus = Callistemon macropunctatus
Callistemon ellipticum? syd2
Callistemon endeavor = Callistemon citrinus
Callistemon endeavour = Callistemon citrinus

Callistemon glabra? syd,24,26 melb,25,26
Callistemon hannah = Callistemon viminalis
Callistemon hypericicifolia? melb,25,26
Callistemon lanceolatus = Callistemon citrinus
Callistemon lophantha? ade,18,24
Callistemon quadrifera? melb3
Callistemon robustus? syd2(stout bottlebrush)
Callistemon rugulosum = Callistemon macropunctatus
Callistemon semperflorens? ade,24
Callistemon Xgawler? melb,48 ade,40,42,47,48
Callistemon Xharkness
Callitris arenosa = Callitris rhomboidea
Callitris calcarata = Callitris endlicheri
Callitris capensis = Widdringtonia cupressoides
Callitris cupressiformis = Callitris rhomboidea
Callitris glauca = Callitris columelaris
Callitris propinqua = Callitris preissii
Callitris pyramidalis = Callitris endlicheri
Callitris quadrivalvis = Tetraclinis articulata
Callitris robusta = Callitris preissii
Callitris robusta(cat syd36) = Callitris endlicheri
Callitris sp.(Murrumbidgee) = Callitris endlicheri
Callitris sp.(Van Diemens land) = Callitris gunnii
Callitris tasmanica = Callitris rhomboidea
Callitris verrocosa = Callitris preissii
Calothamnus clavatus = Calothamnus quadrifidus
Calothamnus grandifolius? melb3
Calycanthus grandiflorus? melb,20,22 ade,13,
Calycanthus laetiflorus? melb,20,22
Calycanthus macrocarpus? ade?,24
Calycanthus macrophyllus = Calycanthus occidentalis
Calycanthus praecox = Chimonanthus praecox
Calystegia pubescens = Calystegia hederacea
Calytrix ericoides = Calytrix tetragona
Calytrix scabra = Calytrix tetragona
Camellia anemoniflora = Camellia japonica
Camellia azurea? ade,5
Camellia myrtifolia = Camellia japonica
Camellia paeonifolia = Camellia japonica
Camphora carolinensis = Persea borbonia
Camphora officinalis = Cinnamomum camphora
Canavalia australis? syd8
Candollea cuneiformis = Hibbertia cuneiformis
Canthium lucidum? syd42
Cantua dependens = Cantua buxifolia
CAPE BROOM? syd19,20 melb11b,12,17,24 ade,8,20,
Capparis Cunninghami? syd5
Capparis hymoena? syd8,13
Capparis reclinata(Capparis diversifolia)? melb7
Caprifolium perfoliatum = Lonicera caprifolium
Cargillia australis? syd5
Carica candamarcensis = Carica pubescens
Carissa arduinea = Carissa bispinosa
Carissa brownii = Carissa lanceolata
Carissa macrocarpa? syd,47
Carissa spectabilis = Acokanthera oblongifolia
Carmichaelia australis = Carmichaelia arborea
Carmichaelia tereta? syd7
Carpinus americanus = Carpinus caroliniana
Carpodonales seratus = Carpodetus seratus
Carya alba = Carya tomentosa
Carya microcarpa = Carya glabra
Carya oliviformis = Carya illinoinensis
Carya sulcata = Carya laciniosa
Caryopteris mastacanthus = Caryopteris incana
Caryopteris tangutica = Caryopteris incana

Caryota sebolifera = Caryota mitis
Caryotaxus japonica = Torreya nucifera
Cassia bicolor? syd1
Cassia candolleana = Cassia bicapsularis
Cassia capensis = Cassia bicapsularis
Cassia coromandeliana = Cassia planitiicola
Cassia distyla? syd42
Cassia glauca = Cassia surattensis
Cassia grandiflora = Cassia laevigata
Cassia homophylla? syd5
Cassia merrylantica = Cassia marilandica
Cassia mexicana? syd,39,
Cassia nemophila = Cassia eremophila
Cassia schinifolia = Cassia planitiicola
Cassia sophora = Cassia planitiicola
Cassinia alba? ade,16,20
Cassinia ericifolia? ade,7,18,24
Castanea vesca = Castanea sativa
Casuarina enuissma = Casuarina torulosa
Casuarina epidophloia = Casuarina stricta
Casuarina eptodada = Casuarina littoralis
Casuarina igida = Casuarina distyla
Casuarina indica = Casuarina equisetifolia
Casuarina kingstonii? ade,12,
Casuarina uadrivalus = Casuarina stricta
Casuarina uberosa = Casuarina littoralis
Catalpa duclouxii = Catalpa fargesii
Catalpa japonica = Catalpa Xhybrida
Catalpa kaempferi = Catalpa ovata
Catalpa syringifolia = Catalpa bignonioides
Cathartocarpus fistula = Cassia fistula
Cathartocarpus roxburghii = Cassia roxburghii
Ceanothus africanus = Notlea africana
Ceanothus albert pittet? melb,36,
Ceanothus albus = Ceanothus rigidus
Ceanothus azureus = Ceanothus coeruleus
Ceanothus blue pacific? melb,49, ade,47,
Ceanothus divaricatus = Ceanothus leucodermis
Ceanothus floribunda = Ceanothus dentatus
Ceanothus Gloire de versailles = Ceanothus Xdelilianus
Ceanothus grandiflorus? ade,13,
Ceanothus hartweigii? melb9
Ceanothus marie simon = Ceanothus Xdelilianus
Ceanothus roweneana = Ceanothus papillosus
Ceanothus Xarnoldii = Ceanothus Xdelilianus
Cederala australis = Toona australis
Celtis mississippiensis = Celtis laevigata
Celtis orientalis = Celtis occidentalis
Cephalotaxus drupacea = Cephalotaxus harringtonia
Cerasus caproniana = Prunus avium
Cerasus ilicifolia = Prunus ilicifolia
Cerasus laurocerasus = Prunus laurocerasus
Cerasus lusitanica = Prunus lusitanica
Cerasus multiplex = Prunus cerasus
Cerasus seiboldtii = Prunus serrulata
Ceratopetalum laurifoliana? syd14,15(Whitewood)
Cerbera manghas = Tabernaemontana dichotoma
Cerbera thevetia = Thevetia peruviana
Cereus armatus = Selenicereus grandiflorus
Cereus bonplaudii = Harrisia bonplandii
Cereus C.M. hovey? melb,20,22
Cereus cavendishii = Monvillea cavendishii
Cereus chiloensis = Trichocereus chiloensis
Cereus crenulata = Cephalocereus lanuginosus
Cereus dyckii? ade,13,
Cereus ferox? melb3

Cereus flagelliformis = Aprocactus flagelliformis
Cereus gardnerii? melb3
Cereus grandiflorum = Selenicereus grandifolium
Cereus ingramnii? ade,5,
Cereus jenkinsonii? syd17
Cereus lowii? syd15,17,18,19 melb,20,22 ade,13,
Cereus macdonaldii = Selenicereus Macdonaldiae
Cereus mallansonii = Heliaporus smithii
Cereus napoleneus = Hylocereus napolensis
Cereus nitens ade,9,13,
Cereus nycticalus = Selenicereus pteranthus
Cereus ottonis? syd4
Cereus phyllocactus? syd,24,
Cereus platygonus = Harrisia platygona
Cereus princips? ade,13,
Cereus quadrangularis = Cereus variabilis
Cereus rostratus = Selenicereus hamatus
Cereus serpentinus = Nyctocereus serpentinus
Cereus speciosis = Cereus variabilis
Cereus speciosissmus = Heliocereus speciosus
Cereus spinulosus = Selenicereus spinulosus
Cereus superbus? melb11
Cereus tortuosus = Harrisia tortuosa
Cereus triangularis = Hylocereus triangularis
Cestrum purpureum = Cestrum elegans
Chaenestes gesneroides? syd15,18,19(Iochroma gesneroides) ade,7,12,18,24
Chaenomeles nivalis = Chaenomeles speciosa
Chaenomeles Rubra grandiflora = Chaenomeles speciosa
Chamaecyparis glauca = Platycladus orientalis
Chamaecyparis spaeroida = Chamaecyparis thyoides
Chamaelaucium wilsonii? melb,40,
Chamaerops arborea = Chamaerops humilis
Chamaerops argentea = Chamaerops humilis
Chamaerops elegans = Chamaerops humilis
Chamaerops excelsa = Rhapis excelsa
Chamaerops fortunii = Trachycarpus fortunii
Chamaerops macrocarpa = Chamaerops humilis
Chamaerops macrophylla? syd16 melb7
Chamaerops martiana = Trachycarpus martianus
Chamocerasus morrowii = Lonicera morrowii
Charlwoodia australis = Cordyline australis
Chenoesthes fuchsiodes? melb,20,22
Cherimoyer = Annona cherimola
Chilianthus diosophyllus? syd15,17,21,24,26,27,29,35,37,39
melb6,18(thousand flowers),20,21,22,23,24,25,26,27,
ade,7,18,20,24,27,29,31,34
Chimonanthus floridus = Calycanthus floridus
Chimonanthus fragans = Chimonanthus praecox
Chimonanthus latifolius? syd10 melb5
Chironia decussata = Orphium frutescens
Chironia frutescens = Orphium frutescens
Chironia grandiflora = Orphium frutescens
Chironia jasminoides? syd4
Chorizema chandleri = Chorizema varium
Chorizema elegans = Chorizema varium
Chorizema grandiflora = Chorizema varium
Chorizema macrophylla = Chorizema varium
Chorizema nobia? melb9
Chorizema soulangeana? melb9,20,24
Chorizema spectablis = Chorizema diversifolium
Chorizema splendens = Chorizema cordatum
Christia grandiflora = Strophanthus speciosus
Cicyos australis? syd2
Cienfugosia hakeaefolia = Alyogyne hakeifolia
Cineraria maritima = Senecio cinerea
Cinnamomum verum = Cinnamomum zeylandicum

Cisalpina tara
Cissus elen danica = Caesalpinia tara
Cissus heterophylla = Cissus rhombifolia
Cistus aborescens? syd,26,27, melb,20,22 = Ampelopsis brevifolia
Cistus algarvensis = Halimium ocymoides
Cistus bothwelliana? melb,20,22
Cistus brillancy = Cistus Xpurpureus
Cistus formosus = Halimium lasianthum
Cistus hirsutus = Cistus psilosepalus
Cistus ledon = Cistus Xglauca
Cistus loreti = Cistus Xstenophylla
Cistus rosmarinifolius = Cistus clusii
Cistus sunset = Cistus crispus
Cistus tauricus = Cistus incanus
Cistus villosus = Cistus incanus
Cistus vulgaris? syd26,27, melb,20,22,
Citharexylum subserratum = Citharexylum fruticosum
Citriobatus microphyllus? ade,7,12,13,18,24,
CITRON = Citrus medica
Citrus australis = Microcitrus australis
Citrus japonica = Fortunella japonica
Clematis alba magna = Clematis lanuginosa
Clematis albert victor = Clematis patens
Clematis amelia? melb7
Clematis Amy Johnson? melb,33,
Clematis appendiculata? syd6
Clematis astrangea? melb9
Clematis azurea = Clematis florida
Clematis barbellata? ade,7,13,24,
Clematis belle of woking = Clematis florida
Clematis bicolor = Clematis florida
Clematis blue boy? melb,33,
Clematis candidissima = Clematis lanuginosa
Clematis coccinea = Clematis texensis
Clematis compta? syd6
Clematis coriacea? syd5
Clematis corymbosa? ade,18,
Clematis Countess d'Bouchard = Clematis Xjackmanii
Clematis davidiana = Clematis heracleifolia
Clematis erecta = Clematis recta
Clematis fair rosamond = Clematis patens
Clematis fortunii = Clematis patens
Clematis gem? melb,20, ade,20,
Clematis glycineides? ade,18,
Clematis Grande Duchess? melb,33,
Clematis graveolens = Clematis orientalis
Clematis hendersonii = Clematis reticulata
Clematis hilli? syd19
Clematis indivisa = clematis paniculata
Clematis jeanne d' arc = Clematis Xlawsoniana
Clematis john gould veitch = Clematis florida
Clematis king of belgium? melb,33,
Clematis Lady boville = Clematis Xjackmanii
Clematis Lady Caroline Neville = Clematis lanuginosa
Clematis Lady Northcliffe = Clematis lanuginosa
Clematis lasutern = Clematis patens
Clematis latrobi? melb11
Clematis lord Derby? melb,20, ade,18,
Clematis Lucie Lemoine = Clematis florida
Clematis Madam E. Andre = Clematis Xjackmanii
Clematis madam van houtte = Clematis lanuginosa
Clematis magnifica = Clematis Xjackmanii
Clematis Miss Bateman = Clematis patens
Clematis Mrs Hope = Clematis lanuginosa
Clematis Nelly Moser = Clematis patens
Clematis Nova Zelandica? Ade,3,

Clematis prince of wales = Clematis Xjackmanii
Clematis rubella = Clematis Xjackmanii
Clematis rubro violacea = Clematis lanuginosus
Clematis shillingi? melb5,7
Clematis sieboldtii = Clematis florida
Clematis sir garnet wolseley = Clematis patens
Clematis sophia = Clematis patens
Clematis sophora? syd19
Clematis star of india = Clematis Xjackmanii
Clematis stella = Clematis patens
Clematis symeiana = Clematis lanuginosa
Clematis tecoma? melb,33,
Clematis thomas moore = Clematis Xjackmanii
Clematis tubulosa = Clematis heracleifolia
Clematis vesta = Clematis patens
Clematis ville de lyons = Clematis Xjackmanii
Clerodendron balfouri = Clerodendron thomsoniae
Clerodendron fallax = Clerodendron speciosissimum
Clerodendron fargesii = Clerodendron trichotomum
Clerodendron foetidum = Clerodendron bungei
Clerodendron fragens = Clerodendron phillippinum
Clerodendron glassnum? syd21 melb24,26
Clerodendron odorata? syd8(Caryopteris wallichiana)
Clerodendron venustum? syd8,13
COBNUT = Corylus avellana
Cochlospermum gossypium = Cochlospermum religiosum
Cocloba platyclada = Homalocladium platycladum
Cocus australis = Arecastrum romanzoffianum
Cocus cornata = Butia capitata
Cocus flexuosa = Arecastrum romanzoffianum
Cocus plumosus = Arecastrum romanzoffianum
Cocus wedelliana = Microcoelum weddellianum
Cocus yattai = Butia Yatay
Coleonema coccinea? syd,45,
Coleonema rubrum = Coleonema pulchrum
Coleonema sunset gold = Coleonema pulchrum
Colletia bictonense = Colletia cruciata
Columnea bronze boy? ade,48,
Columnea elegans? melb3
Columnea splendens = Nematanthus longipes
Colutea alba? ade,13,
Colutea cruenta = Colutea orientalis
Colutea frutescens = Sutherlandia frutescens
Commersonia disyphylla = Rulingia pannosa
Comosperma cordifolia = Comesperma ericinum
Comosperma nucliuscula? syd5
Comospermum latifolia = Comesperma ericinum
Comospermum virgata = Polygala virgata
Conoclinium coelestinum = Eupatorium coelestinum
Conoclinium ianthemum = Eupatorium sordidum
Convolvulus triguriorum? ade,16,
Cookia punctata = Clausena lansium
Coprosma baureiana = Coprosma repens
Coprosma latifolia? melb5,7
Coprosma microphylla = Coprosma quadrifida
Coprosma picturata = Coprosma repens
Coprosma variegata = Coprosma repens
Cordyline cunninghamii? ade,18,
Cordyline festerii? ade,13,
Cordyline nutans? melb5 ade,7,13,18,24,
Cordyline purpurea = Cordyline australis
Cordyline reginae = Cordyline terminalis
Cordyline salicifolia? ade,13,18,
Coriara thymifolia = Coriaria microphylla
Cornus baileyi = Cornus sericea
Cornus elegantissima = Cornus alba

Cornus sibirica variegata = Cornus alba
Cornus spaethi = Cornus alba
Cornus stolonifera = Cornus sericea
Coronilla glauca = Coronilla valentina
Coronilla orientalis? ade,12,
Coronilla pentaphylla? syd,24,26,27, melb9,18,22,23,25,26,
Coronilla procumbens? melb,20,22, ade,18,
Coronocarpus lucida (N.Z. plum)? ade,4,24,
Correa ferruginia = Correa lawrenciana
Correa speciosa = Correa reflexa
Correa splendens? ade,7,18,24,32,33,
Correa virens = Correa reflexa
Correa viridis = Correa reflexa
Cortaderia rosea = Cortaderia selloana
Corylus purpurea = Corylus avellana
Corynocarpus ludlamii? ade,7,
Corynostylos albiflora = Cornyostylos hybanthus
Corypha australis = Livistona australis
COSFORD = Corylus avellana
Cotoneaster amoena = Cotoneaster pannosus
Cotoneaster angustifolia = Pyracantha angustifolia
Cotoneaster applanata = Cotoneaster dielsianus
Cotoneaster baccillaris = Cotoneaster affinis
Cotoneaster eriocapa? melb7
Cotoneaster fontanesii? melb,20,22
Cotoneaster hookerii? syd18,19 adl,12,13,18,24,32,
Cotoneaster humifusa = Cotoneaster dammeri
Cotoneaster macrophylla = Cotoneaster bullatus
Cotoneaster parneyii = Cotoneaster lacteus
Cotoneaster prostrata = Cotoneaster rotundifolius
Cotoneaster thymifolia = Cotoneaster microphyllus
Cotoneaster vicari = Cotoneaster frigidus
Cotoneaster wheeleri = Cotoneaster rotundifolius
Cotyledon arboreus = Crassula arborescens
Cotyledon canariensis? ade,332,33
Cotyledon coccinea = Echeveria coccinea
Cotyledon gibbiflora = Echeveria gibbiflora
Cotyledon lancifolium? syd36
Cotyledon multicaule? syd40,(43)
Cotyledon ovatum = Cotyledon orbiculata
Cotyledon rosea = Echeveria rosea
Cotyledon scapyphylla? syd,36
Cotyledon scheideckerii? syd,36
Cotyledon vulgare? syd6
Craetugus korolkow = Crataegus pinnatifida
Crassula coccinea = Rochea coccinea
Crassula kimberleyensis? syd,36,
Crassula linguaefolia? ade,4,
Crassula macrophylla? melb6
Crassula portulacea = Crassula argentea
Crassula salmonea? ade,32,
Crataegus acerifolia = Crataegus phaenopyrum
Crataegus acutiloba = Crataegus cocccinoides
Crataegus alba flore pleno = Crataegus laevigata
Crataegus arbutifolia = Heteromeles arbutifolia
Crataegus aria = Sorbus aria
Crataegus carrieri = Crataegus Xlavallei
Crataegus coccinea = Crataegus laevigata
Crataegus corallina = Crataegus phaenopyrum
Crataegus cordata = Crataegus phaenopyrum
Crataegus crenulata = Pyracantha crenulata
Crataegus ellwagerni = Crataegus pedicellata
Crataegus gibbsii = Pyracantha atalantioides
Crataegus hodginsii? syd,36,
Crataegus horizontalis? melb,38,
Crataegus macrantha = Crateagus succulenta

Crataegus nepalensis? ade,18,24,
Crataegus nigra? ade,13,
Crataegus odoratissima = Crateagus orientalis
Crataegus oxycantha = Crataegus laevigata
Crataegus persimilis? melb,31,35,
Crataegus puniceus = Crataegus laevigata
Crataegus Pyracantha = Pyracantha coccinea
Crataegus pyrifolia = Crataegus calpodendron
Crataegus Rosea superba = Crataegus laevigata
Crataegus smithiana = Crataegus uniflora
Crataegus splendens = Crataegus Xprunifolia
Crataegus stricta = Crataegus monogyna
Crataegus tenuifolia leanei? melb5
Crataegus undulata? ade,18,24,
Cristaria capensis = Anisodontea scabrosa
Crotalaria arborescens = Crotalaria capensis
Crotalaria elegans = Crotalaria purpurea
Crotalaria lotoides? syd18
Crotalaria trifoliastrium? syd,24,26,35 melb,30,
Crotalaria variegata? syd8
Croton sp. = Codiaeum variegatum
Cryptocarya patentinevis? syd42
Cryptomeria araucariodes = Cryptomeria japonica
Cryptomeria elegans = Cryptomeria japonica
Cryptomeria lobbii = Cryptomeria japonica
Cryptomeria nana = Cryptomeria japonica
Cryptomeria plumosa = Cryptomeria japonica
Crystopteris gracilis? melb6
Crytocarpa laurifolia? syd17
CUMQUAT = Fortunella japonica
Cunninghamia sinensis = Cunninghamia lanceolata
Cupania australis = Diploglottis australis
Cupania cunninghami = Diploglottis cunninghamii
Cupania xylocarpa? melb5,7 ade,7,13,1[illegible],
Cuphea eminens = Cuphea micropetala
Cuphea gallatiena = Cuphea cyanea
Cuphea minniata = Cuphea Xpurpurea
Cuphea platycentia = Cuphea ignea
Cuphea roezlli = Cuphea hookerana
Cuphea silenoides = Cuphea lanceolata
Cuphea strigulosa = Cuphea cyanea
Cuphea tricolor = Cuphea jorullensis
Cuphea zemapani = Cuphea lanceolata
Cupressus africanus = Widdringtonia cupressoides
Cupressus armstrongii? melb,20,
Cupressus australis = Callitris rhomboidea
Cupressus bedfordiana = Cupressus sempervirens
Cupressus benthamiana = Cupressus lusitanica
Cupressus brunniana = Cupressus macrocarpa
Cupressus corneyana = Cupressus torulosa
Cupressus craigiana = Chamaecyparis lawsoniana
Cupressus distisha = Taxodium distichum
Cupressus elegans = Cupressus torulosa
Cupressus excelsa = Cupressus lusitanica
Cupressus expansa = Cupressus sempervirens
Cupressus funebris = Chamaecyparis funebris
Cupressus glauca = Cupressus lusitanica
Cupressus gracilis = Cupressus torulosa
Cupressus horizontalis = Cupressus sempervirens
Cupressus huegelii = Callitris huegelii
Cupressus juniperina = Widdringtonia juniperoides
Cupressus kingentatis? ade,2,
Cupressus knightii = Cupressus lusitanica
Cupressus lambertiana = Cupressus macrocarpa
Cupressus lawsonia = Chamaecyparis lawsoniana
Cupressus lindleyana = Cupressus lusitanica

Cupressus majestica = Cupressus torulosa
Cupressus pendula = Cupressus lusitanica
Cupressus pyramidalis = Cupressus sempervirens
Cupressus scotti = Cupressus goveniana
Cupressus sinensis pendula = Chamaecyparis funebris
Cupressus thyoides = Chamaecyparis thyoides
Cupressus tourniforti = Cupressus sempervirens
Cupressus uhdeana = Cupressus lusitanica
Cupressus whitleyana = Cupressus sempervirens
Cupressus witheringtonii? melb3 ade,5
Cyanophylla bowmanii? syd16,18
Cyanophylla magnificum = Miconia calvescens
Cyathea boylei? ade,16
Cyathea cooperi = Sphaeropteris cooperi
Cyathea dealbata = Alsophila tricolor
Cyathea macarthuri? melb,22
Cyathea medullaris = Sphaeropteris medullaris
Cydonia alba = Chaenomeles speciosa
Cydonia candidissima = Chaenomeles speciosa
Cydonia cardinalis = Chaenomeles speciosa
Cydonia falconnet = Chaenomeles speciosa
Cydonia japonica = Chaenomeles japonica
Cydonia moerloesii = Chaenomeles speciosa
Cydonia nivalis = Chaenomeles speciosa
Cydonia rosea = Chaenomeles speciosa
Cydonia rubra = Chaenomeles speciosa
Cydonia sanguinea = Chaenomeles speciosa
Cydonia umblicata? melb,42,
Cydonia verilion? syd,36,41
Cydonia vulgaris = Cydonia oblonga
Cydonia wintercheer = Chaenomeles speciosa
Cydonia Xsimonii = Chaenomeles Xsuperba
Cyperus variegatus = Cyperus alternifolius
Cyphoeamphylus grandiflora? melb3
Cyrtanthera magnifica = Jacobinia carnea
Cyrtoceras multiflora = Hoya multiflora
Cyrtoceras reflexum = Hoya multiflora
Cytisus adamii = +Laburnocytisus adamii
Cytisus alpinus = Laburnum alpinum
Cytisus andreanus = Cytisus scoparus
Cytisus aurea? syd12
Cytisus C.E. Pearson = Cytisus scoparus
Cytisus cornish cream = Cytisus scoparus
Cytisus daisy hill = Cytisus scoparus
Cytisus donard seedling = Cytisus scoparus
Cytisus elongata = Cytisus multiflorus
Cytisus firefly = Cytisus scoparus
Cytisus florabunda lilac time? melb,31,33,35,37,40,
Cytisus goldfinch = Cytisus scoparus
Cytisus junceus = Spartium junceum
Cytisus laburnum = Laburnum anagyroides
Cytisus leucantus = Cytisus austriacus
Cytisus lord lambourne = Cytisus scoparus
Cytisus monspessulanus = Genista monspessulana
Cytisus oblongata? melb7
Cytisus proliferus = Chamaecytisus proliferus
Cytisus quercifolia? melb8,9
Cytisus ramossimus = Cytisus canariensis
Cytisus rhododaphne? syd7
Cytisus schipoensis? syd,26,
Cytisus spinosa = Calycotome spinosa
Cytisus tomentosus? syd4,6,7,8 melb5(Argyrolobium andrewsianum) ade,5
Cytisus triflorus = Cytisus hirsutus
Cytisus variegatus? syd6
Cytisus vulgare = Laburnum anagryoides
Daboecia polifolia = Daboecia cantabrica

Dacrydium elatum = Podocarpus elatus
Dacrydium excelsum = Podocarpus dacrydioides
Dacrydium spictum? syd6
Daedalacanthus nervosus = Eranthemum pulchellum
Dammara = Agathis
Dammara bidwilli? melb3 ade,2,5,
Dampiera ovalifolia = Dampiera brownii
Dampiera rotundifolia = Dampiera brownii
Dampiera undulata = Dampiera brownii
Daphne dauphine = Daphne Xhybrida
Daphne fortuni = Daphne genkwa
Daphne indica odora = Daphne odora
Daphne purpurea = Daphne Xhoutteana
Darwinia miessneri = Darwinia lejostyla
Dasylirion gracilis = Beaucarnea gracilis
Dasylirion junicfolium = Nolina longifolia
Dasyliron palmeri? ade,18,
Datura corni era = Brugmansia arborea
Daubentonia punicea = Sesbania punicea
Daubentonia speciosa? syd8
Davallia bullata = Davallia trichomanoides
Davallia dissecta = Davallia trichomanoides
Davallia elegans = Davallia denticulata
Davallia japonica? syd15,16,19
Davallia mooreana = Leucostegia pallida
Davallia nove zealandiae = Leptolepia novae-zealandiae
Daviesia ruscifolia = Daviesia ulicifolia
Daviesia ulicina = Daviesia ulicifolia
Daviesia virgata = Daviesia corymbosa
Delabechea rupestris = Brachychiton rupestris
Dendropanax japonica = Dendropanax trifidus
Dennstadtia youngi = Dicksonia youngiae
Deparia moorei = Tectaria moorei
Derringia amberst variegata = Bosea amberstiana
Desmodium acanthocladium? melb,20,22
Desmodium incanum? ade,18,24
Desmodium penduliflorum = Lespedeza thunbergii
Desmodium umbellatum? syd4 melb,26,(plant from Qld.) ade,33,34,35,
Deutzia campanulata = Deutzia gracilis
Deutzia candidissima = Deutzia scabra
Deutzia corymbiflora = Deutzia scabra
Deutzia fortuni = Deutzia setchuenensis
Deutzia marmorata = Deutzia gracilis
Deutzia mexicana ? syd10,15,17,19
Deutzia pride of rochester = Deutzia scabra
Deutzia sielboldiana = Deutzia scabra
Deutzia variegata? syd17,21
Deutzia venusta = Deutzia rosea
Deutzia watereri = Deutzia scabra
Dicera dentata = Elaeocarpus dentatus
Dicksonia cunninghami = Alsophila cunninghami
Dicksonia davallioides = Dennstaedtia davallioides
Dicksonia excelsa = Cyathea excelsa
Dicksonia smithii = Alsophila smithii
Dicliptera violacea? ade,7,13,18,24,
Dictyoptera attenuata? ade,9
Dieffenbachia barquinona = Dieffenbachia maculata
Dieffenbachia bauserii = Dieffenbachia picta
Dieffenbachia jenmannii = Dieffenbachia maculata
Dieffenbachia picta = Dieffenbachia maculata
Diervilla rosea = Weigela rosea
Dillwynia brunoides? melb,33
Dillwynia cinerescens = Dillwynia juniperina
Dillwynia ericifolia = Dillwynia retorta
Dillwynia suaveolens? melb,33,
Dimocarpus kaki? ade,3,

Dimocarpus litchi = Litchi chinensis
Dimorphanthus mandschuricus = Aralia elata
Dioclea glycinoides? ade,7,13,18,24,
Dioscorea bicolor? ade,6,
Dioscorea illustrata = Dioscorea discolor
Diosma alba = Coleonema alba
Diosma compacta? melb,48,
Diosma complexa = Agathosma capensis
Diosma implexa? melb,30,
Diosma pulchrum = Agathosma pulchrum
Diospyrus edulis = Diospyros kaki
Diplacas glutinosus = Mimulus aurantica
Diplacas hybrida = Mimulus hybrida
Diplacaus engleherstii = Mimulus aurantiacus
Diplacus grandiflora = Mimulus bifidus
Diplacus puniceus = Mimulus puniceus
Diplacus splendens = Mimulus puniceus
Diplandenia boliviensis = Mandevilla boliviensis
Diplandenia Xamabilis = Mandevilla Xamabilis
Diplaucas Mrs Scholes = Mimulus puniceus
Diplopappus fruticans = Felicia fruticosa
Diplothemian campestre? ade,7,18,24
Dipteracanthus affinis = Ruellia affinis
Dipteracanthus herbstii = Ruellia herbstii
Disemma aurantia? ade,6,
Disemma coccinea = Passiflora banksii
Disoxylon muelleri? melb,24,
Dodonaea burmaniana = Dodonaea viscosa
Dodonaea conferta = Dodonaea viscosa
Dodonaea cunifolia? syd6
Dodonaea hirtella = Dodonaea boroniifolia
Dodonaea humilis? syd6
Dodonaea preissi = Dodonaea attenuata
Dodonaea pucilloide? melb3
Dodonaea pupurea = Dodonaea viscosa
Dodonaea salsolifolia = Dodonaea ericoides
Dodonaea stenophylla? ade,46,
Dodonaea truncata = Dodonaea trucatiales
Dolichos giganteus = Dolichos lablab
Dombeya dregiana = Dombeya tiliacea
Dombeya mastersii = Dombeya burgessiae
Dombeya natalensis = Dombeya tiliacea
Doodia atkinsonii? syd13,17
Doodia blechnoides = Doodia maxima
Doodia microphylla? syd15,16
Doxantha unguis cati = Macfadyena unguiscati
Dracaceana gladstonei? melb,20,
Dracaena amabilis = Cordyline terminalis
Dracaena australis = Cordyline australis
Dracaena baptisti = Cordyline terminalis
Dracaena belmoreana? syd,26,27,28,29
Dracaena bowenii? melb,20,
Dracaena cannaefolia = Cordyline terminalis
Dracaena chelsoni = Cordyline terminalis
Dracaena congesta = Cordyline stricta
Dracaena cooperi = Cordyline terminalis
Dracaena ensifolia = Dianella ensifolia
Dracaena evansiana? syd16
Dracaena ferrea rosea = Cordyline terminalis
Dracaena fraseri = Cordyline terminalis
Dracaena gayii? syd16,18 ade,18,
Dracaena godseffiana = Dracaena surculosa
Dracaena gracilis = Dracaena marginata
Dracaena guilfoyli = Cordyline terminalis
Dracaena hendersonii? syd13,16,17,18,20,26,27 ade,18,
Dracaena imperialis = Cordyline terminalis

Dracaena indivisa = Cordyline indivisa
Dracaena jaspida? syd13
Dracaena johnsenii? syd17
Dracaena lindeni = Dracaena fragrans
Dracaena magnifica = Cordyline terminalis
Dracaena massangeana = Dracaena fragrans
Dracaena metallica = Cordyline terminalis
Dracaena mocrei? syd17
Dracaena nigra rubra? melb,20,
Dracaena nutans? syd5,6,8,10,12,13,18,20,21,24
melb3,5,6,7,8,9,11,18,20,21,22,23,24,25,26, ade,12,20
Dracaena Queen Victoria = Dracaena fragrans
Dracaena reginae? melb,20
Dracaena Robinsoniana = Cordyline terminalis
Dracaena Robusta = Cordyline terminalis
Dracaena rubra = Cordyline rubra
Dracaena shepardii? syd13,16,17,18,20,26,27,29,30 melb,20, ade,13,
Dracaena stricta = Cordyline stricta
Dracaena terminalis = Cordyline terminalis
Dracaena thompsoni? melb,20 ade,13,
Dracaena vershafeltii? syd17
Dracaena youngea = Cordyline terminalis
Dracocephalum canariense = Cedronella canariense
Drynaria hilliana? syd17
Dryopteris dentata = Thelypteris dentata
Dryopteris deomposita = Ctenitis decomposita
Duranta alba = Duranta repens
Duranta aurea variegata = Duranta repens
Duranta ellisi = Duranta repens
Duranta inermis = Duranta repens
Duranta mexicana = Duranta repens
Duranta plumieri = Duranta repens
Duranta spinosa = Duranta repens
Duvaua dependens = Schinus polygamus
Duvaua longifolia = Schinus polygamus
Earlia excelsa = Graptophyllum excelsum
Echeveria abyssinica? ade,9,13,20,
Echeveria floribunda = Echeveria fulgens
Echeveria glauca major = Echeveria secunda
Echeveria grandivipala? melb,20,22,
Echeveria metallica = Echeveria gibbiflora
Echeveria picta? melb6,20,22,23,26
Echeveria retusa = Echeveria fulgens
Echeveria speciosa? ade,32,33
Echeveria villosa? ade,9,13
Echinocactus eyresii = Echinopsis eyriesii
Echinopsis langsdorfii? syd5
Echites grandifolia? syd16,17,18
Echites longifolia? syd4,5,7,13(umbellata) melb3
Echites melaleuca? syd4,5,7
Echites New Zealand? ade,3, = Prestonia venosa
Echites nutans = Edgeworthia papyrifera
Echites variegata? syd7
Edgeworthia chrysantha = Sophora tetraptera
Edwardsia chiliense? ade,13
Edwardsia grandiflora = Sophora tetraptera(pre 1900)
Edwardsia McNabiana? ade,13,
Edwardsia microphylla = Elaeagnus commutata
Edwardsia smithii? syd17 = Elaeagnus pungens
Elaeagnus argenteus = Elaeagnus pungens
Elaeagnus aurea marginata = Elaeagnus multiflora
Elaeagnus aurea variegata = Elaeagnus latifolia
Elaeagnus edulis = Elaeagnus umbellata
Elaeagnus ferruginea = Elaeagnus multiflora
Elaeagnus japonicus
Elaeagnus longipes

Elaeagnus sieboldti? melb,20,21,22,
Elaeagnus variegatus = Elaeagnus pungens
Elaeis melanococca = Elaeis oleifera
Elaeocarpus cyaneus = Elaeocarpus reticulatus
Elaeodendron australe = Cassine australis
Electron = Alectryon
Eleocarpus ilexifolia? syd8
Eleocarpus persisifolia? syd13
Elyeriscium probituum? syd2
Embothrium wickhami = Oreocallis pinnata
Embothrium wickhani = Oreocallis pinnata
Encephalartos mcquillii = Macrozamia miquelii
Enkianthus japonicus = Enkianthus perulatus
Enkianthus perulatus = Enkianthus japonicus
Epacris campanulata = Epacris impressa
Epacris grandiflora = Epacris longifolia
Epacris sparsa? syd5
Epiphyllum crispum? melb6,11
Epiphyllum ingrami? melb11
Epiphyllum speciosum = Heliocereus speciosus
Epiphyllum tomentosa? melb3
Eranthemum alba marginatum = Pseuderanthemum aminatissimum
Eranthemum andersonii = Pseuderanthemum aminatissimum
Eranthemum bicolor = Pseuderanthemum bicolor
Eranthemum brownii? melb7
Eranthemum lacteum? syd8
Eranthemum nivalis? syd8
Eranthemum sanguinolentum? syd13
Eranthemum sinuata? melb3(anthacanthus Sinuata)
Eranthemum tuberculatum = Pseuderanthemum tuberculatum
Eranthemum variable = Pseuderanthemum variable
Eranthemum violeacea? melb3
Eranthum nigrescens = Pseuderanthemum atropurpureum
Erica aemula? melb6 ade,13,
Erica affinis? ade,13,
Erica alopecoreides = Erica nudiflora
Erica andromedaeflora = Erica holosericea
Erica axilliflora? ade,47,
Erica beaconsfieldiana? syd30 melb,21,22,24,25,26, ade,18,20,24,33,
Erica bowieana = Erica bauera
Erica brownii = Erica ventricosa
Erica bruniades? syd5
Erica Burnetti? melb6,21,22,24,25,26,29, ade,7,18,24,
Erica calycina = Erica corifolia
Erica candidisimma? melb6,18,21,22,24,25,26,29, ade,7,18,20,24,32,33,36,
Erica charleysiana? syd21 melb20,21,22,24,25,26,29,36, ade7,24,
Erica chlorolana? ade,47,
Erica coccinea = Erica verticillata
Erica codonodes = Erica lusitanica
Erica compacta? melb18
Erica empetriodes? melb6
Erica eweriana? melb6,21,2,24,25,26, ade,13,18,24,32,33,36,
Erica flexuosa? syd4
Erica giloa? melb9
Erica grandinosa = Erica formosa
Erica hartnelli? melb6,25,26,29, ade,24
Erica hentyana = Erica bauera
Erica lavender tubes melb,29,
Erica lintons red? syd,49, melb,48,50, ade,47,
Erica longifolia = Erica conspicua
Erica macnabbiana? melb,25,26, ade,24
Erica margaritacea? melb6,9
Erica mimosa coccinea? ade,40,
Erica newmani? ade,40,47,
Erica nigrita? syd5
Erica ovata? syd5

Erica patersonia = Erica abietina
Erica peria? melb,18,24,25,26,36(conica) ade,7,18,24,32,47
Erica phylicordes? syd2(pulchella)
Erica pinkpearl = Erica carnea
Erica pubescens = Erica parviflora
Erica pulchella? syd5
Erica red king? melb,48,
Erica rollinsonia = Erica tricolor
Erica sarmentacea? syd5
Erica sebana rubra = Erica petweri
Erica simulans? ade,47,
Erica stricta = Erica arborea
Erica stumpy? ade,41,47,
Erica tenella? ade,47
Erica tubiflora? syd5,17 melb9
Erica viscaris? syd2,4,5
Erica vulgaris = Calluna vulgaris
Erica winter gem = Erica oatesi
Erioccephalus umbellatus = Eriocephalus africanus
Eriodendron anfractuosum = Ceiba pentandra
Eriostemon ericifolium? ade,16,26,
Eriostemon linearifolium = Geijera parviflora
Eriostemon nerifolium = Eriostemon myoporoides
Eriostemon profusion? ade,47,48,
Eriostemon salicifolius = Philotheca salsolifolia
Eriostemon smithii? ade,12,
Erymophylla prostrata? syd44
Erythrina arborea = Erythrina herbacea
Erythrina atro purpurea? ade,12,
Erythrina australis? syd5
Erythrina camdeni = Erythrina Xbidwillii
Erythrina carnea? syd47
Erythrina coccinea? melb6
Erythrina compacta? syd18,19 melb6
Erythrina cottiana? melb,20,22,
Erythrina cunninhami? syd15,17,19,21
Erythrina imperatrice eugenie? ade,12,
Erythrina india = Erythrina variegata
Erythrina indica = Erythrina variegata
Erythrina insignus = Erythrina caffra
Erythrina laurifolia = Erythrina christ-galli
Erythrina laurifolia = Erythrina crista-galli
Erythrina lithosperma = Erythrina subumbrans
Erythrina Madam Belanger = Erythrina crista-galli
Erythrina picta = Erythrina parcellii
Escallonia balfouri = Escallonia Xexoniensis
Escallonia burkwoodi? melb,36,
Escallonia C.F. Ball = Escallonia rubra
Escallonia Donard's deep pink = Escallonia Xlangleyensis
Escallonia edinburgh = Escallonia Xlangleyensis
Escallonia floribunda = Escallonia bifida
Escallonia fretheyii = Escallonia Xrockii
Escallonia grandiflora? syd4,7,10,12
Escallonia gwendoline anley = Escallonia virgata
Escallonia ingramii = Escallonia rubra
Escallonia macrantha = Escallonia rubra
Escallonia montevidiensis = Escallonia bifida
Escallonia multiflora(Escallonia resinosa)? melb3
Escallonia organensis = Escallonia laevis
Escallonia phillipppiana = Escallonia virgata
Escallonia sanguinea = Escallonia rubra
Escallonia william watson = Escallonia rubra
Eucalyptus andreana = Eucalyptus elata
Eucalyptus angulosa = Eucalyptus incrassata
Eucalyptus august wonder? ade,39
Eucalyptus bicolor = Eucalyptus largiflorens

Eucalyptus callosa? syd14
Eucalyptus constricta? melb,33,
Eucalyptus cordieri = Eucalyptus nortonii
Eucalyptus coriacea = Eucalyptus pauciflora
Eucalyptus cornocalyx = Eucalyptus cladocalyx
Eucalyptus corymbosa = Eucalyptus gummifera
Eucalyptus costata = Eucalyptus incrassata
Eucalyptus cyathiformis? syd42
Eucalyptus elaeophora = Eucalyptus goniocalyx
Eucalyptus eugenoides = Eucalyptus scabra
Eucalyptus fissilis = Eucalyptus obliqua
Eucalyptus gigantea = Eucalyptus delegatensis
Eucalyptus gracilis(Yurrell gum)? syd42 ade,42,45
Eucalyptus hemipholia = Eucalyptus moluccana
Eucalyptus micantha = Eucalyptus racemosa
Eucalyptus numerosa = Eucalyptus elata
Eucalyptus phlebopyhlla = Eucalyptus pauciflora
Eucalyptus pileata? ade,46,
Eucalyptus rosea? melb,30
Eucalyptus rostrata = Eucalyptus camaldulensis
Eucalyptus rubea? ade,27,
Eucalyptus siderophloia = Eucalyptus fibrosa
Eucalyptus stuartiana = Eucalyptus bridgesiana
Eucalyptus tinghaensis? syd42
Eucalyptus transcontinental = Eucalyptus socialis
Eucryphia pinnatifolia = Eucryphia glutinosa
Eugenia apiculata = Luma apiculata
Eugenia aquea = Syzygium aqueum
Eugenia australis = Syzygium paniculatum
Eugenia buxifolia = Eugenia foetida
Eugenia cyanocarpa = Syzygium coolminianum
Eugenia ellipitica = Acmena smithii
Eugenia floribunda = Myricaria floribunda
Eugenia jaisbora? ade,33,
Eugenia jambosa = Myricaria jambos
Eugenia leuhamanni - Syzygium luehmannii
Eugenia macleayensis = Jambosa purpurea
Eugenia mitchelli = Eugenia uniflora
Eugenia myrtifolia = Eugenia paniculatum
Eugenia oleosa = Eugenia paniculatum
Eugenia parvifolia? syd,23,30,35,37,29,43 melb18
Eugenia pendula = Myricaria floribunda
Eugenia smithii = Acmena smithii
Eugenia trinerva? syd5 melb5,7
Eugenia ugni = Ugni molinae
Eugenia ventenatii = Myricaria floribunda
Eulalia japonica = Miscanthus sinensis
Eulalia zebrina = Miscanthus sinensis
Eulterpe edule = Euterpe edulis
Euonymus alba = Euonymus europaea
Euonymus albus latifolius = Euonymus latifolia
Euonymus aurea marginata = Euonymus japonicum
Euonymus Duc d' Anjou = Euonymus japonicus
Euonymus elegantissimus? ade,12
Euonymus gracilis = Euonymus fortunei
Euonymus macrophyllus = Euonymus japonicus
Euonymus media = Euonymus europaeus
Euonymus microphyllus = Euonymus japonicus
Euonymus ovatus = Euonymus japonicus
Euonymus radicans = Euonymus fortunei
Euonymus variegatus = Euonymus japonicus
Euonymus yedoensis = Euonymus hamiltoniana
Eupatorium floribunda?syd5
Eupatorium ianthinum = Eupatorium sordidum
Eupatorium weinmannianum = Eupatorium ligustrinum
Euphorbia bojerii = Euphorbia milii

Euphorbia butcherii? syd15,17,18,19
Euphorbia gigantea?syd5
Euphorbia jacquiniflora = Euphorbia fulgens
Euphorbia raeia? syd2
Euribya = Olearia
Euribya aculeata = Olearia ramulosa
Euribya brachyphylla? syd6(Olearia leptophyllus)
Euribya erubescens = Olearia myrsinoides
Euribya gunniana = Olearia stellulata
Euribya lirata = Olearia stellulata
Euribya rugosa = Olearia stellulata
Eurya latifolia = Eurya japonica
Euryops comosus? syd6
Euscaphis staphyleoides = Euscaphis japonica
Eustrephus augustifolius = Eustrephus latifolius
Eustrephus cymosus? melb5,7
Eutassia excelsa = Araucaria heterophylla
Eutassia simpsoniana = Araucaria columnaris
Eutaxia diffusa = Eutaxia empetrifolia
Eutaxia microphylla = Eutaxia empetrifolia
Exochorda alberti = Exochorda korolkowii
Exochorda grandiflora = Exochorda racemosa
Exochorda imbricata?syd,26,
Fabricia laevigata = Leptospermum laevigatum
Fagus asplenifolia = Fagus sylvatica
Fagus cunninghamii = Nothofagus cunninghamii
Fagus zlatia = Fagus sylvatica
Fatshedera undulatum? melb,49,
Fatsia balfouri?syd44
Feijoa Xcoolidgii = Feijoa sellowiana
Felecia grandiflora? ade,38,
Felicia angustifolia = Diplopappus filifolius
Felicia caffrorum? ade,18,24,32,
Felicia coelestris? melb,34,
Felicia petiolata = Aster petiolata
Felicia petiolata = Aster petiolates
Felicia rotundifolia = Aster rotundifolius
Ferdinandia eminems = Podachaenium paniculatum
Ficus australis = Ficus rubiginosa
Ficus banyan = Ficus religiosa
Ficus chinensis? ade,13,18
Ficus columnairs? (Banyan tree of Lord Howe Island) ade,18,
Ficus cooperii? ade,7,13,18,24,
Ficus cunninghamii = Ficus virens
Ficus decora = Ficus elastica
Ficus doescheri = Ficus elastica
Ficus gigantea(Ficus balica)? melb11
Ficus harlandii? syd19 ade,13,18,24,
Ficus indica = Ficus bengalensis
Ficus lanceolata? ade,7,13,18,24
Ficus longifolia = Ficus bengalensis
Ficus lucida = Ficus benjamina
Ficus lurida? ade,18
Ficus macleayii? ade,12,13,24
Ficus macrocarpa = Ficus macrophylla
Ficus minima = Ficus pumila
Ficus nitida = Ficus benjamina
Ficus obtusata? syd15 ade,6,13,18,
Ficus parcelli = Ficus aspera
Ficus pendula = Ficus benjamina
Ficus photina?syd5
Ficus radicans = Ficus sagittata
Ficus repens = Ficus pumila
Ficus RUBINERVA? melb3
Ficus sanguinensis? syd12,15
Ficus stipulata = Ficus pumila

Ficus syringaefolia? syd6,8,13,17 ade,7,12,13,18,24
Ficus TRICOLOR?syd49
Ficus vasta? ade,18,24,
Ficus vesca = Ficus racemosa
FIG: CHINESE? melb5,8
FILBERT = Corylus avellana
Fitzroya patagonica = Fitzroya cupressoides
Flacourtia cataphracta = Flacourtia jangomas
FORBIDDEN FRUIT = Tabernaemontana dichotoma
Forrestia pubescens? melb7
Forsythia carl pox? melb,47,
Forsythia fortunei = Forsythia suspensa
Forsythia Lynwood gold = Forsythia Xintermedia
Forsythia spectablis = Forsythia intermedia
Forsythia Spring glory = Forsythia Xintermedia
Forsythia variegata aurea = Forsythia suspensa
Fourcraea beddinghausei = Furcraea bedinghausii
Fourcraea lindeni = Furcraea selloa
Fourcroya cubensis? ade,12
Fourcroya gigantea = Furcraea foetida
Fourcroya yuccaefolia?syd5
Francisca speciosa? melb,33,
Franciscea = Brunsfelsia
Franciscea confertiflora = Brunsfelsia pauciflora
Franciscea exima = Brunsfelsia pauciflora
Franciscea Hopeana = Brunsfelsia uniflora
Franciscea macrantha = Brunsfelsia pauciflora
Fraxinus alba = Fraxinus americana
Fraxinus aurea = Fraxinus excelsior
Fraxinus lanceolata = Fraxinus pennsylvanica
Fraxinus lentiscifolia = Fraxinus angustifolia
Fraxinus pubescens = Fraxinus pennsylvanica
Fraxinus sambucifolia = Fraxinus nigra
Fremontia californica = Fremontodendron californicum
Frenalla cupressiformis = Callitris rhomboidea
Frenela fruticosa = Callitris calcarata
Frenella australis = Callitris oblonga
Frenella glauca = Thuja orientalis
Frenella gunnii = Callitris gunnii
Frenella microphylla? melb9 ade,18,24,
Frenella pendula? syd12,17,19 ade,6,
Frenella pyramidis = Callitris endlicheri
Freycentia baueri?syd5
Fuchsia conica = Fuchsia magellanica
Fuchsia coralle = Fuchsia Xexoniensis
Fuchsia corallina = Fuchsia Xexoniensis
Fuchsia globosa = Fuchsia magellanica
Fuchsia gracilis = Fuchsia magellanica
Fuchsia kirkii = Fuchsia procumbens
Fuchsia seratifolia = Fuchsia denticulata
Fuchsia spectabilis = Fuchsia macrostigma
Fugosia hakaefolia = Alyogyne hakeifolia
Fugosia patersonii = Lagunaria patersonii
Fusanus acuminatus = Santalum acuminatum
Gardendia grandiflora = Gardenia jasminoides
Gardenia augusta = Gardenia jasminoides
Gardenia beumiana? syd7,8,10 melb3
Gardenia chartacea? syd13
Gardenia citriodora = Mitriostigma axillare
Gardenia florida = Gardenia jasminoides
Gardenia fortuniana = Gardenia jasminoides
Gardenia gigantea,melb,36,48,50,
Gardenia globosa = Rothmannia globosa
Gardenia intermedia = Gardenia jasminoides
Gardenia magnifica = Gardenia jasminoides
Gardenia major pleno = Gardenia jasminoides

Gardenia profardenia = Gardenia jasminoides
Gardenia radicans = Gardenia jasminoides
Gardenia richardsii? syd12
Gardenia shepherdii? syd15,19 ade,12
Gardenia sinensis? syd10
Gardenia stranleyana = Rothmannia longiflora
Gardenia whitfieldii = Randia malleifera
Garrya biennis? melb5
Garrya MacFadyeniania? ade,7,13,18,24,
Garrya mclacleana? melb6,7,9,18,20,22 ade.12
Gaya lyallii? melb,33,
Geissomeria marmorata? syd13
Genista alba = Cytisus albus
Genista andreana = Cytisus scoparus
Genista canariensis = Cytisus canariensis
Genista delphinesis = Genista sagittalis
Genista elegans? melb,20,21,22
Genista floribunda = Cytisus albus
Genista floridus = Cytisus fragrans
Genista fragrans = Cytisus fragrans
Genista frutescens = Genista tinctoria
Genista italica? syd47 ade,3,
Genista juncea = Spartium junceum
Genista lasicarpa = Genista tinctoria
Genista lilac queen? ade,29,
Genista racemosa = Cytisus racemosa
Genista spachiana = Cytisus spachianus
Genista statics? ade,6,
Germinatia chibusa? syd2
GIANT FILBERT = Corylus maxima
Gleditsia horrida = Gleditsia sinensis
Gleditsia pseudoacacia = Robinia pseudoacacia
Gleditsia viridiflora? melb3
Gleichenia macrophylla?syd5,26,27
Gleichenia spelonae = Gleichenia circinnata
Glochidion australis?syd5
Glycine backhousiana? syd7
Glycine bituminosa = Fagelia bituminosa
Glycine frutescens = Wisteria frutescens
Glycine hendersonia? syd8
Glycine sinese = Wisteria sinensis
Gmelina parviflora = Gmelina asiatica
Gmelina pinifolia? syd2
Gnidia simplex = Gnidia polystachya
Goldfussia anisophylla = Strobilanthes anisophyllus
Goldfussia discolor? syd8
Goldfussia glomerata = Strobilanthes glomeratus
Goldfussia isophylla = strobilanthes isophylla
Gomphocarpus arborescens = Asclepias rotundifolia
Gomphocarpus fruticosus = Asclepias fruticosus
Gompholobium huegeli? melb,46,
Goniophlebium subaucriculatum? melb,20,22,
Goniopteris pennigera = Thelypteris pennigera
Goodia coerulea? melb,33,
GOOSEBERRY: CAPE = Physalis peruviana
Gordonia anomala = Gordonia axillaris
Grevillea belbra? melb,50,
Grevillea blechnum = Grevillea caleyi
Grevillea coccinea = Grevillea concinna
Grevillea coral? melb,50,
Grevillea dallachiana = Grevillea alpina
Grevillea dargan hill? melb,50,
Grevillea desert flame = Grevillea glabella
Grevillea elegans? melb,50,
Grevillea forsterii = Grevillea banksii
Grevillea glen pearl?syd,47,

Grevillea glen sandra?syd,45, melb,50, ade,48,
Grevillea golden sparkle = Grevillea punicea
Grevillea incarnata? ade,16,
Grevillea latroberi = Grevillea ericifolia
Grevillea linearis = Grevillea linearifolia
Grevillea macleayii? melb5
Grevillea marion?syd,45
Grevillea parva? melb,48,
Grevillea rankinsii = Grevillea glabella
Grevillea tenifolia? melb,46,
Grevillea white wings? melb,50,
Gronia occidentalis? syd2
Grumilea capensis = Psychotria capensis
Guarry macrophylla? melb3
GUAVA (PURPLE) = Psidium littorale
GUAVA (WHITE) = Psidium guajava
GUAVA (YELLOW) = Psidium guajava
Guava china? ade,3,
Guillandina bondue = Caesalpinia bonducella
Gymnocladus canadensis = Gymnocladus dioica
Gymnogramma chrysophilla = Pityrogramma chrysophylla
Gymnogramma decomposta = Ctenitis decomposita
Gymnogramma dobroydense? syd17
Gymnogramma mertensi? melb6 ade,13,
Gymnogramma mesterse? syd20
Gymnogramma mortimoreyana? syd17
Gymnogramma peuviana = Pityrogramma calomelanos
Gymnogramma tartarea = Pityrogramma tartarea
Gymnogramma veitchii? syd21
Gymnogramma wettenhalliana = Pityrogramma pulchella
Gynerium argenteum = Cortaderia selloana
Gynerium argenteum plumosus = Cortaderia selloana
Gynerium argenteum roseum = Cortaderia selloana
Gynerium jubatum = Cortaderia jubata
Gynerium roseum = Cortaderia selloana
Gynogramma lauchian = Pityrogramma chrysophylla
Habrothamus aublettii? melb18
Habrothamus corymbosus = Cestrum endlicheri
Habrothamus cyaneus = Iochroma cyaneum
Habrothamus elegans = Cestrum elegans
Habrothamus fasicularis = Cestrum fasciculatum
Habrothamus galli? ade,9,
Habrothamus globosus? syd8,13
Habrothamus newellii = Cestrum newellii
Habrothamus scaber = Cestrum scaber
Habrothamus semiplana? syd6
Habrothamus splendens? syd6 melb,29,
Habrothamus warsewiczi? ade,15,
Haeckeria cassinaeformis? syd6
Haeckeria ozothamnoides? syd6
Hakea brachyrrhyncha = Hakea acicularis
Hakea carnea? melb7
Hakea eucalyptiodes = Hakea laurina
Hakea tenuifolia = Hakea sericea
Hakea teretifolia = Hakea pugioniformis
Hallia imbricata? syd6
Hamamamelus rubra = Hamamelis vernalis
Hardenbergia alba = Hardenbergia violacea
Hardenbergia barclayana? melb,20,22,
Hardenbergia beaumanniana? melb5
Hardenbergia bimaculata? melb,22,
Hardenbergia digitata = Hardenbergia comptoniana
Hardenbergia lindelyana = Hardenbergia comptoniana
Hardenbergia monophylla = Hardenbergia violacea
Hardenbergia ovata = Hardenbergia violacea
Hardenbergia rosea = Hardenbergia violacea

Hastingia coccinea = Holmskioldia sanguinea
HAZEL = Corylus avellana
Hebe decussata = Hebe elliptica
Hebe imperialis = Hebe speciosa
Hebeclinium megaphyllum = Eupatorium megalophyllum
Hebeclinium ianthinum = Eupatorium sordidum
Hedecarya dentata? syd6
Hedera african(cape)? melb3
Hedera algeriensis = Hedera canariensis
Hedera amurensis = Hedera colchica
Hedera caenwoodiana = Hedera helix
Hedera cavandishii = Hedera helix
Hedera cristata = Hedera helix
Hedera dentata = Hedera colchica
Hedera japonica = Hedera rhombea
Hedera latifolia = Hedera helix
Hedera maculata = Hedera helix
Hedera maderensis = Hedera canariensis
Hedera marmorata = Hedera helix
Hedera palmata = Hedera helix
Hedera pannonica? ade,18,24
Hedera pennsylvanica? ade,18,24
Hedera raegneriana = Hedera helix
Hedera rubra argentea = Hedera helix
Hedera sagittifolia = Hedera helix
Hedera spectabilis = Hedera helix
Hedera tricolor = Hedera helix
Hedera triloba = Hedera helix
Hedicarus pseudomorus (bastard mulberry)? ade,7,13,18,24,
Hedysarum spictum? melb2
Heeria elegans = Heterocentron elegans
Heeria rosea = Heterocentron macrostachyum
Heimerliodendron variegata = Pisonia brunonianum
Helichrysum dargan hill monach? melb,50,
Helicia ternifolia = Macadamia ternifolia
Helicia tetraphylla = Macadamia tetraphylla
Heliconia sanguinea? melb5
Heliocarpus cynaeus? syd17
Heliotropium aureum = Heliotropium arborescens
Heliotropium Dr Livingstone? melb,20,22, ade,13,15,18,24,
Heliotropium la petite negress? syd15,19
Heliotropium le roi de nois? melb,20,22
Heliotropium lord roberts = Heliotropium Xvoltaireanum
Heliotropium new giant? melb,20,22
Heliotropium nigrescens? syd20 melb,26,34, ade,7,9,13,18,24,32,33,36,39
Heliotropium peruvianum = Heliotropium arborescens
Heliotropium president garefield? syd17,21 melb6,18
Heliotropium priapo? melb,20,22
Heliotropium triomphe de leige? syd8,15,17,19,21`ade,16,
Heliotropium white lady = Heliotropium arborescens
Hemicyclia australasia?syd(43)
Hemitelia moorei = Lepidorrhachis mooreana
Hemitelia smithi = Alsophila smithii
Henegelia serrulata? melb5
Henfreya scandens = Asystasia scandens
Heptapleurum venulosum = Schefflera venulosa
Hermannia angularis? ade,9,
Hermannia multiflora? ade,9,
Hernanclia bivalvis? ade,9,
Heterocentron album = Heterocentron roseum
Heuchera splendens = Heuchera sanguinea
Hexacentris coccinea = Thunbergia coccinea
Hexacentris mysorensis = Thunbergia mysorensis
Hibbertia billarderi = Hibbertia aspera
Hibbertia prostrata = Hibbertia fasciculata
Hibbertia volubilis = Hibbertia scandens

Hibiscus abelmoschus = Abelmoschus moschatus
Hibiscus agnes galt = Hibiscus rosa-sinensis
Hibiscus andersonii? syd21
Hibiscus apple blossum = Hibiscus rosa-sinensis
Hibiscus baptisii? syd16
Hibiscus bicolor = Hibiscus syriacus
Hibiscus californica = Hibiscus lasiocarpus
Hibiscus californicus = Hibiscus lasiocarpus
Hibiscus chrysanthus = Hibiscus calyphyllus
Hibiscus coelestris = Hibiscus syriacus
Hibiscus colemannii? melb3
Hibiscus conquerer = Hibiscus rosa-sinensis
Hibiscus cooperi = Hibiscus rosa-sinensis
Hibiscus fuchsiodes?syd,35,37
Hibiscus general courteges = Hibiscus rosa-sinensis
Hibiscus grandiflorus = Hibiscus heterophyllus (pre-1900)
Hibiscus grossulariaefolius = Hibiscus huegeli
Hibiscus guilfoyleii? syd12,17 melb11
Hibiscus hakeafolia = Alyogyne hakeifolia
Hibiscus harrisoni? melb7
Hibiscus indicus? melb3
Hibiscus island emperess = Hibiscus rosa-sinensis
Hibiscus jamesii? syd18
Hibiscus lamberti = Hibiscus rosa-sinensis
Hibiscus lampas = Thespesia lampas
Hibiscus lilieflorus = Hibiscus rosa-sinensis
Hibiscus lindeyanus = Hibiscus radiatus
Hibiscus lutea = Hibiscus rosa-sinensis
Hibiscus macleayi? melb3
Hibiscus manihot = Abelmoschus manihot
Hibiscus metallica? syd16
Hibiscus muskato? syd2
Hibiscus pacificus? syd21
Hibiscus palmatus = Abelmoschus manihot
Hibiscus palustris = Hibiscus moscheutos
Hibiscus patersonii = Lagunaria patersonii
Hibiscus sabina? ade,38,42,
Hibiscus splendens? ade,13,
Hibiscus sydneyi? syd4,7
Hibiscus thunbergii? ade,9,13,
Hibiscus tricolor? ade,8,
Hibiscus variablis? ade,5,
Hibiscus vermillion? melb11
Hibiscus wilders white = Hibiscus rosa-sinensis
HICKORY NUT = Carya tomentosa
Hippomane spinosa? syd8
Hoematoxylon campeachianum? syd8
Hoheria osbornei = Hoheria populnea
Holbolia fragens? syd17
HORNBEAM = Carpinus betulus
Hovea elliptica = Hovea celsii
Hovea lanceolata = Hovea longifolia
Hovea purpurea = Hovea longifolia
Hovea seriapis? syd4
Howea kenta = Howea forsterana
Hoya ardiadne? syd12
Hoya campanulata = Physostelma wallichii
Hoya carnea = Hoya carnosa
Hoya cunninghami? melb6 ade,13,
Hoya exotica = Hoya carnosa
Hoya marginata? syd15,17,19
Hoya ovata = Hoya carnosa
Hoya picta = Hoya carnosa
Hoya semperflorens? ade,6,
Hoya trinerva = Hoya pottsii

Hoya variegata = Hoya carnosa
Hoya virdiflorus = Wattakaka volubilis
Hydrangea ataxa = Hydrangea macrophylla
Hydrangea cyanoclada = Hydrangea macrophylla
Hydrangea fimbriata = Hydrangea macrophylla
Hydrangea hortensis = Hydrangea macrophylla
Hydrangea japonica = Hydrangea macrophylla
Hydrangea nigra = Hydrangea macrophylla
Hydrangea otaska = Hydrangea macrophylla
Hydrangea petiolaris = Hydrangea anomala
Hydrangea rosea marginata = Hydrangea macrophylla
Hydrangea scandens = Hydrangea anomala
Hydrangea speciosa? melb,25,26, ade,20,
Hydrangea stellata = Hydrangea macrophylla
Hydrangea Thomas hogg = Hydrangea macrophylla
Hydrangea villosa = Hydrangea aspera
Hymenantha banksii = Hymenanthera dentata
Hymenantha tenuifolium? ade,8,
Hymenospermum japonicum? syd17
Hymenospermum pitosporoides? syd8,13,15,17
Hypericum calerianum? syd18
Hypericum floribundum = Hypericum canariense
Hypericum frutescens? melb7
Hypericum monogynum = Hypericum chinense
Hypericum monophyllum? ade,33,36,39,45,
Hypericum oblonga = Hypericum oblongifolium
Hypericum rowallane = Hypericum hookerianum
Hypericum sempervirens? syd6
Hypericum tricolor = Hypericum Xmoseranum
Hypoestes longifolia? syd5
Ilex angustifolia = Ilex aquifolium
Ilex argentea = Ilex aquifolium
Ilex balearica = Ilex aquifolium
Ilex crassine = Ilex opaca
Ilex daliarica? syd8
Ilex donningtoniensis = Ilex Xaltaclarensis
Ilex ferox = Ilex aquifolium
Ilex flavum? (yellow berries) melb,20,
Ilex heterophylla = Ilex aquifolium
Ilex japonica = Mahonia bealei
Ilex laurifolia = Ilex Xaltaclarensis
Ilex lycium? ade,24,
Ilex myrtifolia = Ilex cassine
Ilex nobilis = Ilex aquifolium
Ilex platyphylla = Ilex perado
Ilex reevsiana = Ilex crenata
Ilex rotundifolia = Ilex opaca
Ilex sempervirens = Ilex aquifolium
Ilex sheppardi = Ilex aquifolium
Ilex sieboldii = Ilex serrata
Ilex waterei = Ilex aquifolium
Illicium religiosum = Illicium anisatum
Impatiens hybrida? syd16
Indigofera coccinea = Swainsona galegifolia
Indigofera coriacea? syd47
Indigofera cytisoides? syd4,6,7 melb3,8,18 ade,12,13,
Indigofera decora = Indigofera incarnata
Indigofera dousa = Indigofera gerardiana
Indigofera fragans? syd2
Indigofera monophylla? syd5
Indigofera rosea? syd12
Indigofera sylvatica = Indigofera australis
Indigofera violacea = Indigofera pulchella
Inga alba? syd13
Inga capensis? syd47
Inga haematoxylon = Calliandra haematocephala

Inga portoricensis = Calliandra portoricensis
Inga pulcherima = Calliandra tweedii
Inga umbrosa? syd8
Iochroma tonelliana? melb6,20,22,ade,13,18,24,32,33,36,
Iochroma tubutosa = Iochroma cyaneum
Ipomoea argyritites? melb11
Ipomoea atro violacea? ade,15
Ipomoea bona nex = Ipomoea acuminata
Ipomoea caerulea-grandiflora? melb5
Ipomoea carnosa? syd5
Ipomoea coccinea = ANNUAL
Ipomoea cordifolia? syd14
Ipomoea ficifolia = Ipomoea bonariensis
Ipomoea grandiflora = Calonyction aculeatum
Ipomoea hardyii? syd18
Ipomoea lachno sperma? ade,7,24,
Ipomoea learii = Ipomoea acuminata
Ipomoea lutea? syd7
Ipomoea pendula = Ipomoea palmata
Ipomoea pentaphylla? ade,6,
Ipomoea quamadi = ANNUAL
Ipomoea sibirica? syd6
Ipomoea tuberosa = Merremia tuberosa
Ipomoea vantricoasa? syd5
Isopogon dawsoni? melb,46,
Isopogon dubus = Isopogon roseus
Ixora alba = Ixora chinensis
Ixora arborea = Ixora parviflora
Ixora bandhuca = Ixora coccinea
Ixora coleei = Ixora chinensis
Ixora cracata = Ixora chinensis
Ixora Dixiana = Ixora chinensis
Ixora grandiflora = Ixora chinensis
Ixora incarnata = Ixora coccinea
Ixora macrophylla = Ixora fulgens
Ixora moresi = Ixora coccinea
Ixora prince of orange = Ixora chinensis
Ixora reflexa? syd17
Ixora rosea = Ixora chinensis
Ixora stricta = Ixora chinensis
Jacaranda tomentosum? ade,18,
JACKFRUIT = Artocarpus heterophyllus
Jambos australis = Syzygium paniculatum
Jambos malaccensis = Syzygium malaccensis
Jambos spartium? melb7
Jambos vulgaris = Syzygium jambos
Jasminium begonefolia? ade,18,
Jasminum acuminatum? melb5,7
Jasminum album? syd12
Jasminum bidwilli = Jasminum lineare
Jasminum chrysanthemum = Jasminum humile
Jasminum de Poiteus? syd13,26,27,29,30,35,37,39 melb,20, ade,7,13,18,24,
Jasminum gracile = Jasminum volubile
Jasminum heterophyllum = Jasminum subhumile
Jasminum indicum? melb5,7
Jasminum kippaxii? syd19
Jasminum ligustrifolium = Jasminum leratii
Jasminum longifolia? syd8
Jasminum Maid of Orleans = Jasminum sambac
Jasminum multipantitum? syd,36,41 ade,7,18,24,
Jasminum poicoiceum? syd,26,27,29,30,31,35,36,37,40(star shaped flowers)
Jasminum portianum? syd17
Jasminum primulinum = Jasminum mesnyi
Jasminum pubescens = Jasminum multiflorum
Jasminum reevesii = Jasminum humile
Jasminum revolutum = Jasminum humile

Jasminum sauvestrum? melb5,7
Jasminum subulatum = Jasminum floridum
Jasminum uniflora? syd8
Jessamine white = Jasmine officinale
Jochroma grandiflora? syd18,24
Jochroma tubulosa? syd4,5,7,8,10,12,15,17,18,19 melb3,5,7,9
Juanulloa parasitica = Juanulloa aurantiaca
Jubaea spectabilis = Jubaea chilensis
JUDAS TREE = Cercis siliquastrum
Juglans alba = Carya tomentosa
Juglans cordiformis = Juglans ailantifolia
Juglans sieboldtii = Juglans ailantifolia
JUNGLE TREE? syd2
Juniperus africanus = Juniperusprocera
Juniperus argentia = Juniperus virginiana
Juniperus attica = Juniperus oxycedrus
Juniperus aurea variegata = Juniperus chinensis
Juniperus blaaw = Juniperus chinensis
Juniperus blue rug? melb,48, ade,47,48,
Juniperus compressa = Juniperus communis
Juniperus cracovia = Juniperus communis
Juniperus erecta = Juniperus communis
Juniperus fortunei = Juniperus chinensis
Juniperus hibernica = Juniperus communis
Juniperus japonica = Juniperus chinensis
Juniperus keteleeri = Juniperus chinensis
Juniperus langoldiana = Juniperus phoenicea
Juniperus laschliana? ade,18,24,
Juniperus lycia? syd8,10,12 melb5,6,8,11
Juniperus macracarpa = Juniperus oxycedrus
Juniperus partium? ade,32,33,44,
Juniperus pfitzeriana = Juniperus media
Juniperus phenicea = Juniperus excelsa
Juniperus procumbens = Juniperus chinensis
Juniperus prostrata = Juniperus horizontalis
Juniperus repens? syd,49,
Juniperus rufescens = Juniperus oxycedrus
Juniperus sinensis = Juniperus chinensis
Juniperus skyrocket? syd,49, ade,47,
Juniperus sphaerica = Juniperus chinensis
Juniperus Stricta = Juniperus excelsa
Juniperus tamariscifolia = Juniperus sabina
Juniperus thujaoides? syd,27,
Justia asperulea = Phlogacanthus asperulus
Justia coccinea = Pachystachys coccinea
Justica caryana = Graptophyllum pictum
Justica creyana? syd4
Justica discolor? ade,7,13,18,24,
Justica flavescens? syd13,15,17 melb3,7
Justica fulvicoma = Schaveria fulvicoma
Justica picta = Graptophyllum pictum
Justica retusa? syd4,6,7 melb3
Justica rosea = Justica carnea
Justica salicina = Jacobinia sericea
Justica splendens = Jacobinia sericea
Justica velutina? ade,18,24,
Justica zebrina? syd13
Kalanchoe flavea? ade,34,
Kalanchoe orbiculata? syd36
Kalanchoe somaliensis = Kalanchoe marmorata
Kalosanthus coccineus = Rochea coccinea
Kalosanthus grandiflora? melb18,23,25,26,
Kennedaya alba = Hardenbergia violacea
Kennedaya baumanni? melb7
Kennedaya coerulea = Hardenbergia comptoniana
Kennedaya digitata = Hardenbergia comptoniana

Kennedeya comptoniana = Hardenbergia comptoniana
Kennedeya glycinoides? ade,18,
Kennedeya mckayana? melb,27, ade,3,13,
Kennedeya ovata alba = Hardenbergia violacea
Kennedeya pentaphylla? ade,7,13,16,18,20,23,24,26,27,29,31,34,36,39,
Kennedeya splendens = Comptosema rubicundum
Kennedeya stephenens? melb,46,
Kentia belmoreana = Howea belmoreana
Kentia Canterburyana = Hedyscepe canterburyana
Kentia forsterana = Howea forsterana
Kentia gracilis = Microkentia gracilis
Kentia mooreana = Lepidorrhachis mooreana
KEREWAH TREE (JAPAN)? syd12
Kie apple? ade,3,
Kunzea latifolia? syd,45,
Laburnum adamii = +Laburnocytisus adamii
Laburnum europaeus? syd5
Laburnum nigricans = Cytisus nigricans
Laburnum semperflorens? melb,36,
Laburnum vulgare = Laburnum anagyroides
Laburnum Xvossi = Laburnum Xwatereri
Lagerstroemia alba = Lagerstroemia indica
Lagerstroemia eavesii = Lagerstroemia indica
Lagerstroemia elegans = Lagerstroemia indica
Lagerstroemia flos-reginae = Lagerstroemia speciosa
Lagerstroemia heliotrope beauty = Lagerstroemia indica
Lagerstroemia mathewsi = Lagerstroemia indica
Lagerstroemia newmanii = Lagerstroemia indica
Lagerstroemia ovalifolia = Lagerstroemia indica
Lagerstroemia reginae = Lagerstroemia indica
Lagerstroemia rosea = Lagerstroemia indica
Lagerstroemia rubra = Lagerstroemia indica
Lantana alba = Lantana camara
Lantana chelsea gem = Lantana camara
Lantana conqueror? syd18 melb18
Lantana delicata = Lantana montevidensis
Lantana diadem = Lantana camara
Lantana flora = Lantana camara
Lantana french varieties? syd15,19
Lantana gol gol? ade,47,
Lantana goliath = Lantana camara
Lantana grandiflora = Lantana crocea
Lantana involucrata(L> stricta)? syd5
Lantana mutablis = Lantana camara
Lantana sanguinea = Lantana camara
Lantana sellowii = Lantana montevidensis
Lapageria alba = Lapageria rosea
Larix europea = Larix decidua
Larix leptolepsis = Larix kaempferi
Lasiandra fontanesiana = Tibouchina granulosa
Lasiandra gloria? melb,36,
Lasiandra Grandiflora = Tibouchina semidecandra
Lasiandra heteromala = Tibouchina heteromala
Lasiandra macrantha = Tibouchina semidecandra
Lasiandra microphylla = Osbeckia kewensis
Lasiandra orandiflora = Tibouchina semidecandra
Lasiandra rosea = Melastoma malabrathricum
Lasiandra tomentosa? syd17
Lastrea cristata = Dryopteris cristata
Lastrea opaca = Dryopteris varia
Lastrea richardsii corymbosa = Dryopteris richardsii
Latania Borbonica = Latania lontaroides
Latania commersonii = Latania lontaroides
Latania rubra = Latania lontaroides
Latania woodfordi = Livistona woodfordii
Lauras australis (Cryptocarya australis)? syd13,15,17

Lauras borbonia = Persea borbonia
Lauras camphora = Cinnamomum camphora
Lauras ceylonica = Cinnamomum zeylanicum
Lauras lingus(persea lingue)? melb3
Lauras longifolia? syd6
Lauras lucidum? melb3
Lauras macrophyllum? melb3
Lauras nitida (Cinnamomum nitidum)? syd5,18,19
Lauras regalis = Lauras nobilis
Lauras sassafras = Sassafras albidum
Lauro certisus Cerasus = Prunus laurocerasus
Laurocerasus officinalis = Prunus laurocerasus
Laurocerasus schipkaensis reynvanii? melb,31,37,
Lavandula arbrotanoides = Lavandula multifida
Lavandula spicta = Lavandula angustifolia
Leichardtia macleayana = Callitris macleayana
Leptospermum alba plena = Leptospermum scoparium
Leptospermum arachnoidem = Leptospermum scoparium
Leptospermum buxifolium = Leptospermum flavescens
Leptospermum chapmanii = Leptospermum scoparium
Leptospermum citratum = Leptospermum petersonii
Leptospermum citrinus? melb,50,
Leptospermum diffusum? syd2
Leptospermum grandifolium = Leptospermum flavescens
Leptospermum imbricatum = Baeckea camphorosmae
Leptospermum keatleyii = Leptosermum scoparium
Leptospermum lambethii = Leptospermum scoparium
Leptospermum multiflorum = Leptospermum scoparium
Leptospermum nicholsii = Leptospermum scoparium
Leptospermum persiciflorum = Leptospermum squarrosum
Leptospermum pubescens = Leptospermum lanigerum
Leptospermum red damsk = Leptospermum scoparium
Leptospermum sandersii = Leptospermum scoparium
Leptospermum tuberculatum = Leptospermum flavescens
Leptospermum Xwalkerii = Leptospermum scoparium
Leptosyne gigantea = Coreopsis gigantea
Leschenaultia eldoraldo? melb,50,
Leschenaultia magnifica? melb,33,
Leschenaultia scarlet o'hara? melb,49,50,
Leschenaultia tango? melb,50,
Leucadendron decorum? ade,36,40,44
Leucodendron plumosum? ade,46,
Leucophaea candidissima? ade,24,
Leucophyta brownii = Calocephalus brownii
Leucopogon adpressus = Leucopogon muticus
Leucopogon australis = Leucopogon lanceolatus
Leucopogon richei = Leucopogon parviflorus
Leucospermum attentuatum? ade,40,
Leucospermum conocarpum = Leucospermum concarpodendron
Leycesteria variegata = Leycesteria formosa
Lhotskya genetylloides = Calytrix alpestris
Libocedrus chiliensis = Austrocedrus chilensis
Libocedrus decurrens = Calocedrus decurrens
Libocedrus doniana = Libocedrus plumosa
Libonia floribunda = Justica rizzinii
Libonia penrhosiensis = Justica rizzinii
Ligustrum argentea? melb,48,
Ligustrum arvensis? syd12
Ligustrum aureum elegantissimum = Ligustrum ovalifolium
Ligustrum californicum = Ligustrum ovalifolium
Ligustrum ciliatum = Ligustrum tschonskii
Ligustrum coriaceum = Ligustrum japonicum
Ligustrum floribundum? syd18
Ligustrum folis argenteis pictis = Ligustrum sinense
Ligustrum golden variegatum = Ligustrum ovalifolium
Ligustrum green? ade,22,

Ligustrum ibota = Ligustrum ovalifolium
Ligustrum ionandrum = Ligustrum delavayanum
Ligustrum lodense = Ligustrum vulgare
Ligustrum ovatum = Ligustrum japonicum
Ligustrum pubescens = Ligustrum sinense
Ligustrum spicatum = Ligustrum indicum
Ligustrum tricolor = Ligustrum lucidum
Ligustrum variegatum = Ligustrum vulgare
Limonium dumosa? ade,42,
Lindera serica? ade,18,
Linum trigynum = Reinwardtia trigyna
Lippia citriodora = Aloysia triphylla
Liquidambar festerii = Liquidambar styraciflua
Lithospermum coerulea? syd30,36,41
Lithospermum prostratum = Lithodora diffusa
Litobrochia comans = Pteris comans
Litobrochia incisa = Histiopteris incisa
Livistonia inermis = Livistonia humilis
Livistonia mauritiana = Livistonia chinensis
Livistonia olivaeformis = Livistonia chinensis
LOGANBERRIES = Rubus ursinus
Logonia ligustrifolia? syd2
Lomaria alpina = Blechnum pennamarina
Lomaria attenuata(Lomaria gigantea)? melb6 ade,9,16,
Lomaria bipinnatifida? melb,20,22, ade,16,
Lomaria cartalaginea = Blechnum cartilagineum
Lomaria ciliata = Blechnum moorei
Lomaria dalgairnseli = Blechnum dalgairnseli
Lomaria discolor = Blechnum discolor
Lomaria falcata = Blechnum discolor
Lomaria fluviatilla = Blechnum fluviatile
Lomaria fraserii = Blechnum fraserii
Lomaria gibba = Blechnum gibbum
Lomaria patersoni = Blechnum patersonii
Lomaria procera = Blechnum capense
Lomaria victoria? ade,9,
Lomaria vulcanica = Blechnum vulcanicum
Lomatia heteromorpha? syd6
Lomatia longifolia = Lomatia myricoides
Lomatia paradoxa? syd5
Lonchocarpus lackii(bloobwood)? syd,37,39
Lonicera alberti = Lonicera spinosa
Lonicera aurea-reticulata = Lonicera japonica
Lonicera balearica = Lonicera implexa
Lonicera brachypoda = Lonicera japonica
Lonicera capituta(scarlet honeysuckle)? syd4,5,7,8 melb3,5
Lonicera chiliensis? ade,24,
Lonicera coccinea = Lonicera sempervirens
Lonicera confusa = Lonicera japonica
Lonicera firecracker? melb,50
Lonicera flexuosa = Lonicera japonica
Lonicera gigantea = Lonicera etrusca
Lonicera grandiflora rosea = Lonicera tatarica
Lonicera halliana = Lonicera japonica
Lonicera longifolia? ade,6,
Lonicera multiflora = Lonicera japonica
Lonicera pulcherrima = Lonicera tatarica
Lonicera punicea = Lonicera Xbrownii
Lonicera rubrum = Lonicera tatarica
Lonicera semperflorens? syd,26,27,29
Lonicera sinense = Lonicera japonica
Lophospermum grandiflora? syd5,8,15,17,18,19,26,27,29 ade,6,
Lophospermum hendersonii = Asarina erubescens
Lophospermum mexicana? syd6
Lophospermum microphylla? syd17
Lophospermum scandens = Asarina erubescens

Ligustrum ibota = Ligustrum ovalifolium
Ligustrum ionandrum = Ligustrum delavayanum
Ligustrum lodense = Ligustrum vulgare
Ligustrum ovatum = Ligustrum japonicum
Ligustrum pubescens = Ligustrum sinense
Ligustrum spicatum = Ligustrum indicum
Ligustrum tricolor = Ligustrum lucidum
Ligustrum variegatum = Ligustrum vulgare
Limonium dumosa? ade,42,
Lindera serica? ade,18,
Linum trigynum = Reinwardtia trigyna
Lippia citriodora = Aloysia triphylla
Liquidambar festerii = Liquidambar styraciflua
Lithospermum coerulea? syd30,36,41
Lithospermum prostratum = Lithodora diffusa
Litobrochia comans = Pteris comans
Litobrochia incisa = Histiopteris incisa
Livistonia inermis = Livistonia humilis
Livistonia mauritiana = Livistonia chinensis
Livistonia olivaeformis = Livistonia chinensis
LOGANBERRIES = Rubus ursinus
Logonia ligustrifolia? syd2
Lomaria alpina = Blechnum pennamarina
Lomaria attenuata(Lomaria gigantea)? melb6 ade,9,16,
Lomaria bipinnatifida? melb,20,22, ade,16,
Lomaria cartalaginea = Blechnum cartilagineum
Lomaria ciliata = Blechnum moorei
Lomaria dalgairnseli = Blechnum dalgairnseli
Lomaria discolor = Blechnum discolor
Lomaria falcata = Blechnum discolor
Lomaria fluviatilla = Blechnum fluviatile
Lomaria fraserii = Blechnum fraserii
Lomaria gibba = Blechnum gibbum
Lomaria patersoni = Blechnum patersonii
Lomaria procera = Blechnum capense
Lomaria victoria? ade,9,
Lomaria vulcanica = Blechnum vulcanicum
Lomatia heteromorpha? syd6
Lomatia longifolia = Lomatia myricoides
Lomatia paradoxa? syd5
Lonchocarpus lackii(bloodwood)? syd,37,39
Lonicera alberti = Lonicera spinosa
Lonicera aurea-reticulata = Lonicera japonica
Lonicera balearica = Lonicera implexa
Lonicera brachypoda = Lonicera japonica
Lonicera capituta(scarlet honeysuckle)? syd4,5,7,8 melb3,5
Lonicera chiliensis? ade,24,
Lonicera coccinea = Lonicera sempervirens
Lonicera confusa = Lonicera japonica
Lonicera firecracker? melb,50
Lonicera flexuosa = Lonicera japonica
Lonicera gigantea = Lonicera etrusca
Lonicera grandiflora rosea = Lonicera tatarica
Lonicera halliana = Lonicera japonica
Lonicera longifolia? ade,6,
Lonicera multiflora = Lonicera japonica
Lonicera pulcherrima = Lonicera tatarica
Lonicera punicea = Lonicera Xbrownii
Lonicera rubrum = Lonicera tatarica
Lonicera semperflorens? syd,26,27,29
Lonicera sinense = Lonicera japonica
Lophospermum grandiflora? syd5,8,15,17,18,19,26,27,29 ade,6,
Lophospermum hendersonii = Asarina erubescens
Lophospermum mexicana? syd6
Lophospermum microphylla? syd17
Lophospermum scandens = Asarina erubescens

Lophospermum volubile? syd7
Lophospermun atrosanguineum = Rhodochiton volubile
Lophospermun coccineum? melb,21,
Lophostemon australis = Tristania conferta
Lophostemon australis = Tristania conferta
Lotus luteus? melb9
Lotus pelyorhinchus = Lotus berthelotii
Lotus sericeus(Hosackia pushiana)? syd7
Luculia tsetensis = Luculia grandifolia
Lycium rigidum = Lycium chinense
Lycium ven(sb)ion? syd1
Lygodictylon scandens = Lygodium scandens
Lygodium dichotoma = Lygodium circinatum
Lygodium forsteri = Lygodium reticulatum
Lygodium venustum = Lygodium polymorphum
Lysinema pungens = Woollsia pungens
Macadamia ternifolia = Macadamia integrifolia
Maclura aurantiaca = Maclura pomifera
Macrozamia corallipes gyrata = Macrozamia spiralis
Macrozamia cylindrica = Macrozamia spiralis
Macrozamia denisonii = Lepidozamia peroffskyana
Macrozamia douglasi? ade,13,
Macrozamia mackenziesii = Macrozamia spiralis
Macrozamia plumosa = Macrozamia Pauli-Guilielmi
Magnolia alexandriana = Magnolia Xsoulangiana
Magnolia amabilis = Magnolia Xsoulangiana
Magnolia annonaefolia = Michelia figo
Magnolia bicolor? syd15,17,18,19,21,26,27
Magnolia conspicua = Magnolia heptapeta
Magnolia cordata = Magnolia acuminata
Magnolia cordifolia? melb7
Magnolia denudata = Magnolia heptapeta
Magnolia discolor = Magnolia quinquepeta
Magnolia flora rubra? melb,40,
Magnolia fusculata = Michelia figo
Magnolia glauca = Magnolia virginiana
Magnolia gracetus? ade,2,
Magnolia gracilis = Magnolia quinquepeta
Magnolia lanceolata = Magnolia grandiflora
Magnolia lennei = Magnolia Xsoulangiana
Magnolia liliflora = Magnolia quinquepeta
Magnolia mollicomata = Magnolia campbellii
Magnolia obovata = Magnolia hypoleuca
Magnolia parviflora = Magnolia sieboldii
Magnolia praecox? melb3
Magnolia pumila = Magnolia co'co
Magnolia purperea = Magnolia quinquepeta
Magnolia umbrella = Magnolia tripetala
Magnolia yulan = Magnolia heptapeta
Mahonia fascicularis = Mahonia aquifolium
Malpighia robusta? syd18
Malus aldenhamensis = Malus Xpurpurea
Malus dartmouth = Malus pumila
Malus eleyi = Malus Xpurpurea
Malus eva rathe? melb,28,29,31,34,36,
Malus golden hornet? melb,46
Malus hillieri = Malus Xscheideckeri
Malus hopa? ade,33,
Malus lemonei = Malus Xpurpurea
Malus leucadendron = Malus quinquenervia
Malus niedzwetzkyana = Malus pumila
Malus parkmani = Malus halliana
Malus riversi = Malus spectabilis
Malus siberian crab? syd,36 melb,31,40, ade,13,18,20,24,
Malus sonning? melb,42,
Malus tenorea carnea? melb,31,33,35,

Malus theifera
MANDERIN = Malus hupehensis
Mandevilla suavolens = Citrus reticulata
Manettia bicolor = Mandevilla laxa
Manettia glabra = Manettia inflata
Marattia elegans = Manettia cordifolia
Marianthus bignoniaceus = Marattia salicifolia
Maurandya alba = Billardoera bignoniacea
Maurandya barclayana = Asarina barclaiana
Maurandya emeryana rosea? ade,15, = Asarina barclaiana
Maurandya rosea = Asarina barclaiana
Maurandya semperflorens = Asarina barclaiana
Medeola asparagoides = Asparagus asparagoides
Medeola smilax = Asparagus asparagoides
Medinilla amabilis = Medinilla teysmannii
Melaleuca adnata = Melaleuca eleuterostachya
Melaleuca crassifolia = Melaleuca laxifolia
Melaleuca curvifolia? syd6
Melaleuca deanii? ade,24,
Melaleuca elachophylla? ade,46,
Melaleuca genistifolia = Melaleuca decora
Melaleuca glabrescens? ade,13,
Melaleuca imbricata? ade,13,
Melaleuca oriaia = Melaleuca brevifolia
Melaleuca paludosa = Callistemon salignus
Melaleuca parvifolia = Melaleuca laxifolia
Melaleuca pustulata = Melaleuca halmaturorum
Melaleuca tenuifolia? syd5
Melanoschium decipens? melb,18,
Melastoma aspermum? syd,37,39,40,44,(42)
Melastoma coerulea? syd8
Melastoma heteromalia = Tibouchina heteromalia
Melastoma macrantha = Tibouchina semidecandra
Melia australis = Melia azedarach
Melia candollei? syd6
Melia semperfloren = Melia azedarach
Meniscium kennedyii
Meniscium palustre = Dryopteris serrata
Meniscium serratum = Dryopteris serrata
Menziesia alba = Daboecia cantabrica
Menziesia polifolia = Daboecia cantabrica
Mespilus grandiflora = XCrataegomespilus grandiflora
Mespilus japonica = Eriobotrya japonica
Mespilus nivea = Amelanchier canadensis
Mespilus pensylvannica? syd5,7,10
Mespilus pyracantha = Pyracantha coccinea
Metrosideros aromatica = Eucalyptus piperita
Metrosideros capitata = Kunzea capitata
Metrosideros coccinea? ade,25,26,
Metrosideros coriacea = Melaleuca quinquenervia
Metrosideros decora = Melaleuca genistifolia
Metrosideros floribunda = Angophora intermedia
Metrosideros lucida = Metrosideros umbellatus
Metrosideros speciousus = Callistemon speciosus
Metrosideros tomentosa = Metrosideros excelsus
Metrosideros villosa = Metrosideros kermadecensis
Metrosideros virdiflorus = Callistemon salignus
Meyenia erecta = Thunbergia erecta
Meyenia vogelliana = Thunbergia vogeliana
Michelia coniea? syd2
Michelia fuscata = Michelia figo
Micolepia platyclada? ade,18,
Microlepia dixeana? syd,26,27
Microlepia elata? ade,13,18?
Microlepia elegans? melb,20,22, ade,9,13,18,
Microlepia Hirta cristata = Microlepia pyramidata

Micromyrtus microphyllus = Micromyrtus ciliatus
Microsorum irioides = Polypodium punctatum
Mimosa grandiflora? syd1
Mimosa nilotica = Acacia nilotica
Mimulus duplex = Mimulus luteus
Mimulus exquiste? melb3
Mimulus hendersonii? syd7
Mimulus Mrs scholes = Mimulus puniceus
Mimulus nobilis? syd15,19
Mimulus regia? melb3
Mirbelia reticulata = Mirbelia rubiifolia
Monetia barleriodes? ade,7,18,24,
Morus australis = Broussonetia papyrifera
Morus mauritiana(Ampalis madagascariensis)? syd5
Morus multicaulis = Morus alba
Morus tartarica = Morus alba
Muehlenbeckia platycada = Homalocladium platycladum
MULBERRY (morus alba or morus nigra)? syd2,7,10,12
MULBERRY: BENGAL? syd1
MULBERRY: CAPE? syd1,13,16,17,40
MULBERRY: PAPER = Broussonetia papyrifera
Murraya exotica = Murraya paniculata
Murucuja adiantifolia = Passiflora banksii
Murucuja ocellata(Passiflora murucuya)? syd5
Musa arnoldiana = Ensete ventricosum
Musa cavendishii = Musa acuminata
Musa ensete = Ensete ventricosum
Musa lady's finger = Musa Xparadisiaca
Musa plantain = Musa Xparadisiaca
Musa religiosa = Ensete gilletii
Musa rosacea(Mauritius plantan tree)? syd5
Musa sapientium = Musa Xparadisiaca
Musa superba = Ensete superbum
Musa zebrina = Musa acuminata
Myoporum boobyalla = Myoporum insulare
Myoporum carsonii = Myoporum laetum
Myoporum crassifolium? syd6
Myoporum crystallinum? ade,7,13,18,24,
Myoporum cunnighamii = Myoporum acuminatum
Myoporum ellipticum = Myoporum insulare
Myoporum glandulosum = Myoporum viscosum
Myoporum lucidum? syd6
Myoporum pentandrum? syd6
Myoporum punctatum? syd78(spotted myoporum) melb3,7,9
Myoporum tuberculatum = Myoporum serratum
Myrica cordifolia? syd6
Myrica quercifolia? syd4,7
Myroxylon argenteum? ade,13
Myroxylon pereira = Myroxylon balsamum
Myrsine insularis (Ardisia insularis)? syd5,6
Myrsine undulata? syd2
Myrsine variabilis = Rapanea variabilis
Myrsiphyllum asparagoides = Asparagus asparagoides
Myrtus acuminata = Myrtus communis
Myrtus bullata = Lophomyrtus bullata
Myrtus europea? ade,44,
Myrtus grandiflorus = Myrtus communis
Myrtus melastomoides(Rhodamnia trinerva)? syd5
Myrtus microphyllus = Myrtus communis
Myrtus obcordatus = Lophomyrtus obcordata
Myrtus pedunculata = Neomyrtus pedunculata
Myrtus ralphii purpurea = Lophomyrtus XRalphii
Myrtus romanus = Myrtus communis
Myrtus tenuifolia = Austromyrtus tenuifolia
Myrtus tomentosus = Rhodomyrtus tomentosa
Myrtus ugni = Ugni molinae

Negundium americanum = Acer negundo
Negundo fraxinifolia = Acer negundo
Neillia opulifolia = Physocarpus opulifolius
Nephelium lieocarpum = Alectryon subcinereus
Nephrodium decompositum = Dryopteris decomposita
Nephrodium glabrum = Dryopteris decomposita
Nephrodium gracile = Dryopteris gracilis
Nephrodium molle = Dryopteris dentata
Nephrodium velutina = Dryopteris velutina
Nephrolepis Anna Foster = Nephrolepis exaltata
Nephrolepis bostoniensis = Nephrolepis exaltata
Nephrolepis bridgesi = Nephrolepis exaltata
Nephrolepis compacta = Nephrolepis exaltata
Nephrolepis cristata = Nephrolepis exaltata
Nephrolepis davalliodies = Nephrolepis acuminata
Nephrolepis erecta? syd21,26,27
Nephrolepis furcans = Nephrolepis exaltata
Nephrolepis longipennis? syd17
Nephrolepis lycopodiodes = Nephrolepis exaltata
Nephrolepis marshallii = Nephrolepis exaltata
Nephrolepis piersoni = Nephrolepis exaltata
Nephrolepis roosevelti = Nephrolepis exaltata
Nephrolepis todeaoides = Nephrolepis exaltata
Nephrolepis tremula = Nephrolepis exaltata
Nephrolepis tuberosa = Nephrolepis cordifolia
Nephrolepis undulata? melb6
Nephrolepis whitmani = Nephrolepis exaltata
Nerium odurum = Nerium oleander
Nerium splendens = Nerium oleander
Nesedombeya tawa? syd8
Nierembergia azurea = Nierembergia scoparia
Nothopanax laetum = Neopanax laetus
Nuttalia cerasiformis = Osmaronia cerasiformis
Ochna mauritiana? syd12
Ochna serrulata = Ochna multiflora
Octoclinus macleayana = Callitris macleayana
Olea acuminata? syd8,15,17,19,21 melb6 ade,7,13,18,24
Olea armenicanus = Osmanthus americanus
Olea coccinea? ade,9,
Olea cunninghamii = Olea europaea
Olea fragrans = Osmanthus fragrans
Olea ilicifolia = Osmanthus heterophyllus
Olea lanceolata? syd18
Olea lucca? syd(43)
Olea montana(rororo olive)? melb9 ade,9
Olea myrtifolia? ade,32
Olea sativa = Olea europaea
Olea vulgaris = Olea europaea
Olea wightiana? syd8,13 melb8(Olea dioca)
Olearia dentata = Olearia tomentosa
Olearia gunniana = Olearia stellulata
Opuntia albicans? melb6 ade,13,20
Opuntia boliviensis = Opuntia pentlandii
Opuntia cochinilites = Nopalea cochenillifera
Opuntia decipiens = Opuntia imbricata
Opuntia decumasa? syd18
Opuntia dillenii? ade,3
Opuntia ferox? syd5 melb11
Opuntia flavicans = Opuntia robusta
Opuntia glaucophylla? ade,3,
Opuntia horrida? ade,3,9,13,
Opuntia leucocantha = Opuntia ficus-indica
Opuntia longispinus? ade,3,4,
Opuntia polyanthus = Opuntia tuna
Opuntia pseudotuna? syd5 melb6
Opuntia similis? syd17

ORANGE: BAHIA
ORANGE: MALTA = Citrus sinensis
ORANGE: MYRTLE LEAVED = Citrus sinensis
ORANGE: PARRAMATTA = Citrus aurantium
ORANGE: SEVILLE = Citrus sinensis
ORANGE: ST. MICHAELS = Citrus aurantium
Orbus vernus? melb,36, = Citrus sinensis
Oreodombeya californica
Oreodoxia regia = Umbellularia californica
Ornus europaeus = Roystonea regia
Osmanthes aquifolium = Fraxinus ornus
Osmanthes illicifolius = Osmanthus heterophyllus
Osmanthes variegata rara = Osmanthus heterophyllus
Osmanthus myrtifolius = Osmanthus heterophyllus
Osmunda falcata? syd21,26,27 = Osmanthus heterophyllus
Osmunda palustris
Osteospermum laevigatum? melb,18, = Osmunda regalis
Othonna athanaisiae
Owenia cerasifera = Euryops athanasiae
Oxyleya xanthoxylon? syd5,12 (Flindersia oxyleyana) = Pleiogynium solandri
Ozanthamnus diosmaefolius = Helichrysum diosmifolium
Pachysandra nepalensis? melb3
Paeonia arborea = Paeonia suffruticosa
Paeonia moutan = Paeonia suffruticosa
Paliurus aculeatus = Paliurus spina-christi
Panax angustifolia? melb5,8
Panax arborea = Neopanax arboreus
Panax dallichiana? melb3
Panax dendroides? melb5,7,9
Panax elegans = Tieghemopanax elegans
Panax fruticosa = Polyscias fruticosa
Panax murrayi = Polyscias murrayi
Panax schaefferi? melb7
Pandanus javanicus = Pandanus utilis
Pandanus pacificus = Pandanus dubius
Pandanus spiralis? syd5
Papyrus antiquorum = Cyperus papyrus
Passiflora acerifolia? ade,18,
Passiflora are-en-ciel? ade,18,24,
Passiflora bananna = Passiflora mollissima
Passiflora bealli? syd18,19
Passiflora bedfordiana? melb,27,28,35,
Passiflora blakii? syd7
Passiflora Camdenii? syd7,10 melb3,7,9
Passiflora campbelli? melb,20,22,
Passiflora Constance elliot = Passiflora caerulea
Passiflora Count Nesseldon? syd7,9
Passiflora delicata? syd7
Passiflora elegans? syd7 melb3
Passiflora Enysford gem = Passiflora caerulea
Passiflora floribunda(setflora)? syd7 melb3
Passiflora fragrent beauty? melb18
Passiflora glauca = Passiflora stipulata
Passiflora grandilla = Passiflora quadrangularis
Passiflora hybrida? melb7
Passiflora john spalding? melb,20,22
Passiflora kermisina = Passiflora raddiana
Passiflora kingiana? syd7 melb3
Passiflora macrocarpa = Passiflora quadrangularis
Passiflora mayana = Passiflora caerulea
Passiflora middletoniana? syd6,7,10 melb3,7
Passiflora minima? ade,13,
Passiflora munro? melb,20,22
Passiflora oldfield gem? melb,23,24,25,26,
Passiflora oliveriana = Passiflora suberosa
Passiflora perfecta? melb?,32,

Passiflora sanguinolenta? syd26,27,36,41,(43) melb,23,25,26,29, ade,7,13,18,
Passiflora speciosa? syd6
Passiflora subpeltata = Passiflora alba
Passiflora vestportilio = Passiflora misera
Paulownia imperialis = Paulownia tomentosa
Pavetta fruticosa? syd16,18
Pavetta lanceolata? ade,7,24,
Pavetta velutina = Pavetta indica
Pavia californica = Aesculus californica
Pavia macrostachya = Aesculus parviflora
Pavonia coccinea = Malvaviscus arboreus
Pavonia multiflora = Triplochlamys multiflora
PAWPAW = Carica papaya
PECAN = Carya illinoinensis
Pedilanthus canaliculata? ade,9,13,18,24,
Pedilanthus euphorbiodes? syd7
Pedilanthus longipes? ade,9,
Pentaptergium serpens = Agapetes serpens
Pentas carnea = Pentas lanceolata
Pereskia godseffiana = Pereskia aculeata
Pereskia horrida? syd6 melb3
Pereskia laurifolia? ade,3,
Pergularia ovata? syd5
Peristrophe lanceolata variegata = Peristrophe lanceolaria
Pernettya angustifolia = Pernettya mucronata
Pernettya bell's seedling = Pernettya mucronata
Pernettya speciosa = Pernettya mucronata
Persea gratissima = Persea americana
Persoonia latifolia = Persoonia lanceolata
Persoonia salicina? melb,33,
Persoonia variablis? ade,8,13,
Petalostigma quadrilocure? syd42
Petrea africana? melb5
Petrea stapeliae = Petrea volubilis
Petrophila pulchella = Petrea fucifolia
Petrophylla anethifolia = Isopogon anemonifolius
Phaedranthus buccinatories = Distictis buccinatoria
Phaseolus carcalla = Vigna caracalla
Phebalium asteriscophorum = Asterolasia asteriscophora
Phebalium elatum = Phebalium billardierii
Phebalium lineare? syd14
Philadelphus atalas = Philadelphus Xcymosus
Philadelphus aurea = Philadelphus coronarius
Philadelphus avalanche = Philadelphus Xlemoinei
Philadelphus belle etoile = Philadelphus Xpurpureo-incalatus
Philadelphus bicolor? melb,36,41
Philadelphus boule d'Argent = Philadelphus Xlemoinei
Philadelphus candalabbria = Philadelphus Xlemoinei
Philadelphus dianthaeflours = Philadelphus coronarius
Philadelphus enchantment = Philadelphus Xlemoinei
Philadelphus fimbriatus? melb,27,
Philadelphus fleur de neige = Philadelphus Xvirginalis
Philadelphus gordonianus = Philadelphus lewisii
Philadelphus grandifolius = Philadelphus inodorus
Philadelphus latifolius = Philadelphus pubescens
Philadelphus mount blanc = Philadelphus Xlemoinei
Philadelphus multiflorus = Philadelphus coronarius
Philadelphus norma? melb,27,31,
Philadelphus primuloeflorus = Philadelphus coronerius
Philadelphus rosacae = Philadelphus Xlemoinei
Philadelphus speciosa = Philadelphus indorus
Philadelphus vellida? melb,36,41,
Philadelphus voi lactae = Philadelphus Xcymosus
Phillyrea ligustrifolia = Phillyrea latifolia

Philodelphus vulgaris? melb,41,
Philodendron anderson's red? melb,49,
Philodendron andreanum = Philodendron melanochrysum
Philodendron cannifolium = Philodendron martianum
Philodendron dubium = Philodendron radiatum
Philodendron friedrichsthalii = Monstera friedrichsthalii
Philodendron lindenianum = Philodendron verrucosum
Philodendron micans = Philodendron scandens
Philodendron New Yorker? ade,39,
Philodendron panduraeforme = Philodendron bipennifolium
Philodendron pertusum = Monstera deliciosa
Philodendron sodiroi = Philodendron ornatum
Philodendron trifoliatum = Synogonium auritum
Phlebodium aureum = Polypodium aureum
Phlebodium irriodes = Polypodium punctatum
Phlomis candicans? ade,13,18,
Phlomis leonorus = Leonotis leonurus
Phoenix cycadaefolia = Phoenix dactylifera
Phoenix farnifera = Phoenix pusilla
Phoenix leonensis macrocarpa = Phoenix canariensis
Phoenix pumila = Phoenix reclinata
Phoenix spinosa = Phoenix reclinata
Phoenix tenuis = Phoenix canariensis
Phoenix zanzibariensis? syd,26,27
Phormium purpurea = Phormium tenax
Photina arbutifolia = Heteromeles arbutifolia
Photina dubia(Eriobotrya bengalensis? syd5
Phyllanthus atropurpurens = Breynia disticha
Phyllanthus insularis (Glochidion insulanum)? syd5
Phyllanthus nivosus = Breynia disticha
Phyllanthus rosea = Breynia disticha
Phyllanthus variegata? syd7,8 melb3
Phyllarea = Phillyrea
Phyllica latifolia = Phillyrea latifolia
Phyllocactus alba? syd,26,29,30
Phyllocactus Empress of germany? syd26,27,29,30
Phyllocactus guillardii? melb11
Phyllocactus hybrid van hoffni? melb11
Phyllocactus ingrami? melb6
Phyllocactus leippermani? melb6
Phyllocactus phyllanthus = Epiphyllum phyllanthus
Phyllocactus prissteri? melb11
Phyllocactus seidelianum? melb6
Phyllocactus vipermernes? melb11
Phyllocladus alpinus = Phyllocladus trichomanoides
Phyllostachys castilloni = Phyllostachys bambusoides
Phymatodes pustulatum = Polypodium pustulatum
Physalis austata? syd1
Physalis edulis = Physalis peruviana
Physianthus albus = Araujia sericifera
Phytolaccia decandra = Phytolacca americana
Phytolaccia pupurascens? ade,9,18,
Picea alba = Picea glauca
Picea albertiana conica = Picea glauca
Picea amabilis = Abies amabilis
Picea balsamea = Abies balsamea
Picea douglassii = Pseudotsuga menziesii
Picea fraseri = Abies fraseri
Picea kosteriana glauca = Picea pungens
Picea nigra = Picea mariana
Picea nobilis = Abies procera
Picea Nordmanniana = Abies nordmanniana
Picea pindrow = Abies pindrow
Picea pinsapo = Abies pinsapo
Picea septentrionalis = Picea abies
Picea webbiana = Abies spectabilis

Pillyrea vilmoreana
Pimelea decustta = Phillyrea decora
PINE: JAMICA ? syd2 = Pimelea ferruginea
Pinus alerse? syd4,7
Pinus amabilis
Pinus Aucklandiana = Abies lasiocarpa
Pinus australis = Pinus gerardiana
Pinus austriaca = Pinus palustris
Pinus beardsleyii = Pinus nigra
Pinus benthamiana = Pinus ponderosa
Pinus brutia = Pinus ponderosa
Pinus coerulea = Pinus halepensis
Pinus edgariana = Picea glauca
Pinus excelsa = Pinus muricata
Pinus fermontiana = Pinus wallichiana
Pinus fertilis = Pinus monophylla
Pinus filifolius? melb11 = Pinus cembroides
Pinus grandis
Pinus insingnis = Abies grandis
Pinus larico = Pinus radiata
Pinus larix = Pinus mugo
Pinus leiiophylla? syd47 = Larix decidua
Pinus llaveana
Pinus longifolia = Pinus cembroides
Pinus macrophylla = Pinus roxburghii
Pinus maritima = Pinus coulteri
Pinus mexicana = Pinus pinaster
Pinus monspeliensis = Pinus cembroides
Pinus montana = Pinus pinaster
Pinus pallasiana = Pinus mugo
Pinus parryana = Pinus nigra
Pinus picea = Pinus quadrifolia
Pinus pindrow = Picea abies
Pinus pyrenaica = Abies pindrow
Pinus rubra = Pinus halepensis
Pinus russelliana = Pinus resinosa
Pinus tenuifolia = Pinus montezumae
Pinus tuberculata = Pinus maximinoi
Pinus webbiana = Pinus attenuata
Piper futokadsura = Abies spectabilis
Pisonia australis? syd8 = Piper kadsura
Pisonia excelsa (Malaya catchtbird tree)
Pisonia grandis = Pisonia umbellifera
Pithicolobium grandiflorum = Abarema grandiflora
Pithicolobium pruinosum = Abarema sapindoides
Pithicolobium umbrosum? syd15 melb3,5
Pittosporum acaciodes = Pittosporum phillyraeoides
Pittosporum aureum? syd17
Pittosporum colensoi = Pittosporum tenuifolium
Pittosporum flavum = Tabernaemontana laurifolia
Pittosporum garnetti = Pittosporum tenuifolium
Pittosporum gracile? syd10 melb5,7
Pittosporum hamiltonia? syd2
Pittosporum japonicum? syd8,10
Pittosporum lucidum? syd6,8,15,17,18,19 melb3 ade,6,
Pittosporum macrocarpum = Pittosporum eugenioides
Pittosporum macrophyllum? syd5,11
Pittosporum matipo? syd10
Pittosporum myrsine? syd10 ade,6,
Pittosporum nigrescens = Pittosporum tenuifolium
Pittosporum pendululm? syd5 ade,6,
Pittosporum tetraptrum? ade,18,
Pittosporum variegata = Pittosporum undulatum
Pittosporum zeylandicum? melb7
Plagianthus betulinus = Plagianthus regius
Plagianthus lyalli = Hoheria lyallii

Plagianthus tasmanicus = Plagianthus pulchellus
Planera acuminata = Zelkova serrata
Platanus palmata = Platanus orientalis
Platanus superbra? ade,18,
Platylobium cordifolia? syd6
Platylobium latifolium? syd5
Platylobium macrocalyx = Platylobium obtusangulum
Plectranthus ornatus? syd7
Plectranthus thrysoides? melb,25,26,29,
Plectranthus variegata? syd,17, ade,7,18,24,
Pleiobodium aureum? syd17
Pleroma hetromallum = Tibouchina heteromalla
Pleroma sarmentosa = Tibouchina laxa
Pleuranda ericaefolia = Hibbertia stricta
Plumbago capensis = Plumbago auriculata
Plumbago larpentae = Ceratostigma plumbaginoides
Plumbago mexicana = Plumbago scandens
Plumbago rosea = Plumbago indica
Plumeria acutifolia = Plumeria acuminata
Plumeria frangipanni = Plumeria acuminata
Plumeria rubra = Plumeria acuminata
Podalyria grandifolia = Podalyria calyptrata
Podalyria hirsutus(cordata)? syd2
Podalyria stryracifolia = Podalyria calyptrata
Podocarpus asplenifolius = Phyllocladus aspleniifolius
Podocarpus australis? syd4,18 melb3,5,7
Podocarpus BLACK PINE? syd,33,
Podocarpus cupressimus? syd19
Podocarpus koraiana = Podocarpus macrophyllus
Podocarpus longifolia = Podocarpus macrophyllus
Podocarpus pruinosus = Podocarpus elongatus
Podocarpus pungens = Podocarpus totara
Podocarpus sinensis = Podocarpus macrophyllus
Podocarpus taxifolia = Podocarpus montanus
Podocarpus verticellatus = Sciadopitys verticillata
Podochoemium paniculatum = Podachaenium eminens
Poinciana gilliesi = Caesalpinia gilliesii
Poinciana pulcherrima = Caesalpinia pulcherrima
Poinciana regia = Delonix regia
Poinsettia albida = Euphorbia pulcherrima
Poinsettia pulcherrima = Euphorbia pulcherrima
Poivrea coccinea = Combretum coccineum
Polycarpa maximowiczii? ade,24
Polygala attenuata = Polygala oppasitifolia
Polygala cordata = Polygala oppasitifolia
Polygala cordifolia = Polygala oppasitifolia
Polygala grandiflora = Polygala chamaebuxus
Polygala grandis = Polygala X palmas
Polygala latifolia = Polygala oppasitifolia
Polygala speciosa = Polygala virgata
Polygonum compactum = Polygonum cuspidatum
Polygonum platycladum? melb5,7
Polygonum vulgare? syd5,36,41
Polypodium appendicalatuma = Dryopteris squamaestipes
Polypodium attenuatum = Polypodium brownii
Polypodium glaucum? melb6
Polypodium pennigera = Thelypteris pennigera
Polypodium rugulosum = Polypodium punctatum
Polypodium scandens = Microsorium scandens
Polypodium seiboltii? syd17
Polypodium vacillans = Polypodium loriceum
Polypodium viridifolium? melb3
Polystichum proliferum = Polystichum setiferum
Pomaderris bicolor? syd5
Pomaderris phillyraefolia = Pomaderris phillyreoides
Pomax glabra = Pomax umbellata

Pomax hirta = Pomax umbellata
Ponceltia sprengelioides = Sprengelia ponceletia
Populus argentea bolleana = Populus alba
Populus aurea = Populus Xcanadensis
Populus betulifolia = Populus nigra
Populus bolleana = Populus alba
Populus caroliana = Populus Xcanadensis
Populus dilata = Populus nigra
Populus eucalyptus? ade,24,32,
Populus fastigata = Populus nigra
Populus italica = Populus nigra
Populus lombardii = Populus nigra
Populus macrophylla = Populus canescens
Populus monolifera = Populus nigra
Populus nivea vel acerifolia = Populus Xcanadensis
Populus serotina = Populus Xcanadensis
Populus virginiana regeneri? melb,36,
Populus webstii? ade,24,
Posopis juliflora? syd,42,
Pothos argyrea = Schindapsus pictus
Pothos aurea = Epipremnum aureum
Prinos verticillata = Ilex verticillata
Pritchardia filifera = Washingtonia filifera
Prostanthera coerulea = Prostanthera caerulea
Prostanthera rylestonei? melb,46,
Prostanthera saxicola X montana? melb,50,
Prostanthera westringaeformis? syd6
Protea arborea? ade,40,
Protea aurea = Protea longifolia
Protea conocara? ade,3,
Protea eximia = Protea latifolia
Protea hirsta? ade,24,
Protea laticolor = Protea longifolia
Protea marginata? ade,33,
Protea rosea = Protea nana
Protea saligna = Leucadendron salignum
Protea scolymus = Protea scolymocephala
Prumnopitys elegans = Podocarpus andinus
Prunus caproniana ranunculiflora = Prunus cerasus
Prunus moserii = Prunus Xblireiana
Prunus myrobolana = Prunus cerasus
Prunus pissardi = Prunus cerasifera
Prunus pollardii = Prunus Xpollardii
Prunus rosea = Prunus cerasus
Prunus sinensis = Prunus glandulosa
Prunus vesuvius = Prunus cerasifera
Pscchotia expansa (Pteris malayana)? syd12
Pseudomaris australis? melb3
Pseudopanax adiantifolia? ade,42,
Pseudopanax lineare? melb,46,
Pseudotsuga douglasii = Pseudotsuga menziesii
Pseudotsuga taxifolia = Pseudotsuga menziesii
Psidium aromatica = Psidium guajava
Psidium cattleianum = Psidium littorale
Psidium cordatum = Psidium montanum
Psidium luteum = Psidium littorale
Psidium pomiferum = Psidium guajava
Psidium pyriferum = Psidium guajava
Psoralia = Psoralea
Psoralia adescens? syd6
Psoralia australasica? syd6 (patens)
Psoralia capitata? syd6
Psoralia spicta? syd6
Psychosperma alexandra = Archontophoenix alexandrae
Psychotia cymosa? ade,7,24,
Psychotia expansa? syd,12,

Pteris argyrea = Pteris quadriaurita
Pteris asculentum? syd17
Pteris bipinnara? syd21
Pteris cristata = Pteris cretica
Pteris flabellata = Pteris dentata
Pteris gerandiafolia = Doryopteris concolor
Pteris laciniata? melb6(pteris gheisbrightii)
Pteris longifolia = Pteris vittata
Pteris millanium = Pteris milneana
Pteris nemoralis = Pteris biaurita
Pteris ouvradii = Pteris cretica
Pteris rotundifolia? syd17
Pteris seabrulea? syd17 melb6
Pteris serrulata = Pteris multifida
Pteris ternifolia = Pteris multifida
Pteris vespertilions = Histiopteris incisa
Pteris wimjetti = Pteris cretica
Ptychosperma alexandrae = Archontophoenix alexandrae
Pueraria thunbergia = Pueraria lobata
Pultenaea mollis? syd6
Punecea flore pleno = Punica granatum
Pyracantha gibbsii = Pyracantha atalantioides
Pyracantha griffithi? syd44
Pyracantha hodginsii? syd44
Pyracantha yunnanensis = Pyracantha fortuneana
Pyrostegia ignea = Pyrostegia venusta
Pyrus aria = Sorbus aria
Pyrus aucuparia = Sorbus aucuparia
Pyrus baccata = Malus baccata
Pyrus chinensis = Pyrus communis
Pyrus cydonia = Cydonia oblonga
Pyrus discolor = Sorbus aucuparia
Pyrus domestica = Sorbus discolor
Pyrus halepensis? melb,34,
Pyrus japonica = Chaenomeles japonica
Pyrus manchurian? melb,42,
Pyrus maulei = Chaenomeles japonica
Pyrus spectabilis = Malus spectabilis
Quercus aegilops = Quercus macrolepis
Quercus americana rubra = Quercus rubra
Quercus castanea = Quercus muehlenbergii
Quercus coerulea? syd8
Quercus concordia = Quercus robur
Quercus cuspidata = Castanopsis cuspidata
Quercus discolor = Quercus prinus
Quercus fastigiata = Quercus robur
Quercus freithi? melb,34,
Quercus giloa? melb18
Quercus glabra = Lithocarpus glaber
Quercus lanata = Quercus leucotricophora
Quercus leucombrian = Quercus cerris
Quercus microcarpa = Quercus robur
Quercus microcarpa = Quercus robur
Quercus pendunculata = Quercus robur
Quercus petiolaris? syd47
Quercus rugosa? syd47
Quercus scarlet = Quercus coccinea
Quercus serrata = Quercus acutissima
Quercus sessiliflora = Quercus petraea
Quercus spicata = Quercus reticulata
Quercus tinctoria = Quercus velutina
Quercus triloba = Quercus falcata
Quercus turkey? melb,32,36,
Quercus virens = Quercus virginiana
Quercus wrightii? ade,24,
Quisqualis glabra = Quisqualis indica

Quisqualis pubescens = Quisqualis indica
Raphidorphora aurea = Epipremnum aureum
Retinospora argentia plumosa = Chamaecyparis pisifera
Retinospora crisppsi = Chamaecyparis obtusa
Retinospora ericoides = Chamaecyparis obtusa
Retinospora filifera aurea = Chamaecyparis pisifera
Retinospora Leptoclada = Chamaecyparis pisifera
Retinospora lycopodiodes = Chamaecyparis obtusa
Retinospora obtusa = Chamaecyparis obtusa
Retinospora pisifera = Chamaecyparis pisifera
Retinospora plumosa = Chamaecyparis pisifera
Retinospora retusa? syd10,18
Retinospora sewellii = Cryptomeria japonica
Retinospora sieboldii? melb,36,
Retinospora squarrosa = Chamaecyparis pisifera
Rhagodia billarderi? syd6
Rhagodia parabolica? syd6
Rhamnus serrulatus? syd5
Rhamnus tetragona (Cassine scandens)? syd2
Rhamnus variegata = Rhamnus alaternus
Rhaphiolepis fergusoni? syd40(43) melb,42,
Rhaphiolepis intermedia? syd18,24,26,27,28,29,31,
melb18,21,22,25,26,27,28,31,
Rhaphiolepis ovata = Rhaphiolepis umbellata
Rhapis flabelliformis = Rhapis excelsa
Rhapis flabelliformis = Rhapis excelsa
Rhodochiton volubile = Rhodochiton atrosanguineum
Rhododendron calendulacea = Rhododendron calendulaceum
Rhododendron californicum = Rhododendron macrophyllum
Rhododendron elegans = Rhododendron pauciflorum
Rhododendron gibsonii = Rhododendron formosum
Rhododendron ledifolia = Rhododendron mucronatum
Rhododendron lindleyanum = Rhododendron lindleyi
Rhododendron ovata = Rhododendron ovatum
Rhododendron phoenicia = Rhododendron pulchrum
Rhododendron sinense = Rhododendron molle
Rhododendron yayehiryu = Rhododendron Xyayegiri
Rhodotypos kerroides = Rhodotypos scandens
Rhoicissus rhombifolium = Cissus rhombifolia
Rhoupala corcouadensis = Roupala macrophylla
Rhoupala de Jonghii? syd8
Rhoupala skinnerii? syd8
Rhoupala younghii? syd8
Rhus cotinoides = Cotinus obovatus
Rhus cotinus = Cotinus coggygria
Rhus juglandifolium? ade,3,
Rhus osbeckii = Rhus chinensis
Rhus pendula? syd5
Rhus rhodanthemum = Rhodosphaera rhodanthema
Rhus rufa? syd12
Rhus semi-alata = Rhus chinensis
Rhus venenta = Rhus vernix
Rhus virginiana? ade,18,
Rhycospermum argentea maculata? syd16,18,21 melb18 ade,13,18,20,31,34,
Rhycospermum japonicum latifolia = Trachelospermum jasminoides
Rhycospermum jasminoides = Trachelospermum jasminoides
Rhycospermum maculatum? melb,23,24,25,26, ade,13,18,
Rhycospermum reptans = Trachelospermum jasminoides
Ribes grossularia = Ribes uva-crispa
Ribes lumbortsii? melb,41,42,
Ricinus cambodgiensis = Ricinus communis
Ricinus gibsonii = Ricinus communis
Ricinus sanguinea = Ricinus communis
Rivina brasiliensis = Rivina humilis
Rivina laevis = Rivina humilis
Robinea monophylla = Robinia pseudoacacia

Robinia bessoniania = Robinia pseudo-acacia
Robinia decaisneana = Robinia Xambigua
Robinia rosea = Robinia hispida
Rochea falcata = Crassula falcata
Rogeria macrophylla(Rondeletia)? syd18,21 ade,7,18,24,
Romneya trichocalyx = Romneya coulteri
Rondeletia andwalli? ade,6,
Rondeletia speciosa = Rondeletia odorata
Rondeletia strigosa = Rondeletia anomala
Rondeletia versicolor = Rondeletia anomala
Rosa ferox = Rosa horrida
Rosa fulgens = Rosa cinnamomea
Rosa indica = Rosa chinensis
Rosa lucida duplex = Rosa virginiana
Rosa muscosa = Rosa centifolia
Rosa semperflorens = Rosa chinensis
Rosa sinica = Rosa chinensis
ROSE APPLE = Syzygium jambos
ROSE MOSS = Rosa centifolia
Roxburghia gloriosoides = Stemona tuberosa
Roxburghia viridiflora = Stemona tuberosa
Rubus apiifolius(parsley leaf)? ade,13,
Rubus asperifolius? melb7
Rubus californian? ade,13,18,
Rubus eglanteria = Rubus rosifolius
Rubus english? ade,13,18,
Rubus indica? syd18,19
Rubus kittatiny? ade,13,18,24,
Rubus lindleyi? melb7
Rubus macropodus? syd6
Rudbeckia bicolor superbra = Rudbeckia hirta
Rudbeckia golden glow = Rudbeckia laciniata
Ruellia formosa = Ruellia elegans
Ruellia lilacina = Ruellia schauerana
Ruesellia africanus? syd2
Ruscus latifolius = Ruscus aculeatus
Ruscus racemosus = Danae racemosa
Russelia juncea = Russelia equisetiformis
Russelia multiflora = Russelia sarmentosa
Sabal adamsonii = Sabal minor
Sabal umbraculifera = Sabal blackburniana
Sagus vitiensis = Metroxylon vitiensis
Salisburia adiantifolia = Ginkgo biloba
Salix amygdalina = Salix triandra
Salix aurea = Salix babylonica
Salix coerulea = Salix alba
Salix fastigata? syd47
Salix forbyana = Salix purpurea
Salix helix = Salix purpurea
Salix hoffmannion = Salix triandra
Salix humboldtii = Salix chilensis
Salix hybrida? syd,29,
Salix lanceolata = Salix triandra
Salix laurina = Salix phylicifolia
Salix petreum? ade,12
Salix Russellisus = Salix fragilis
Salix sacremento? syd26,27,29 melb,36,
Salix salamonii = Salix Xsepulcralis
Salix tortulosa = Salix matsudana
Salix tricolor? ade,32,33
Salix vitellina = Salix alba
Salvia africana = Salvia leucantha
Salvia barbata = Salvia leucantha
Salvia betheli = Salvia involucrata
Salvia bruanti = Salvia splendens
Salvia compacta = Salvia coccinea

Salvia glory of stuttgart = Salvia splendens
Salvia gracilis? melb11
Salvia hoyeyi = Salvia ianthina
Salvia issanchon = Salvia splendens
Salvia liliana = Salvia azurea
Salvia nigricans? melb,25,26,29,
Salvia plebia? syd6
Salvia polystacha? melb7 ade,7,13,18,24,
Salvia rutilans = Salvia elegans
Salvia superba = Salvia Xsuperba
Salvia verchaffelti? melb,22, ade,13,18,24,
Salvia vulgaris = Salvia officinalis
Sambucus aurea = Sambucus nigra
Sambucus folis argentea = Sambucus nigra
Sambucus folis aurea = Sambucus nigra
Sambucus lacinata = Sambucus racemosa
Sambucus variegatus = Sambucus nigra
Sambucus xanthocarpa = Sambucus pubens
Sambucus xylocarpa? melb11
SANDLEWOOD (Santalum sp)? syd2
Santolina incana = Santolina chamaecyparissus
Santolina pectinata = Santolina acuminatum
Sapindus sebiferus? syd2
Sapota australis = Planchonella australis
Sapota costata = Planchonella costata
Sarcococca humilis = Sarcococca hookerana
Scaevola mauve beauty? ade,48,
Scaevola microcarpa = Scaevola albida
Scaevola suaveolens = Scaevola calendulacea
Scaevola taccada = Scaevola koeningii
Schefflera actinophyllaa = Brassaia actinophyllaa
Schima norhonae = Schima wallichii
Schinus areira = Schinus molle
Schotia speciosa = Schotia afra
Schotia tamarindifolia = Schotia afra
Schotia tubifolia? syd6
Schubertia graveolens = Araujia sericifera
Sciadaphyllum macrophyllum? syd47
Scyphanthus elegans? melb,21,
Seaforthia elegans = Archontophoenix cunninghamiana
Selligua hamiltoniana? melb,20,22,
Sempervivum arborescens = Aeonium arborescens
Senecio leucostachys = Senecio vira-vira
Senecio scandens = Senecio mikaniodes
Sericographis ghiesbreghtiana = Justicia spicigera
Serissa japonica = Serissa foetida
Sersalisia sericea? syd47
SHADDOCK = Citrus maxima
Sida mollis? syd7
Sida pulchella = Cynatrix pulchella
Sida tomentosa? melb3
Sideroxylon argentum(ironwood)? ade,7,18,24,
SINGING TREE? syd2
Siphocamphylos bicolor = Lobelia laxiflora
Siphonodon australe? syd,42,(Australian ivory wood
Skimmia oblongata = Skimmia japonica
Smilax latifolia = Smilax australis
Smilax mauritanicus? melb7,18,25,26, ade,7,13,24,
Smilax sarsaparilla = Smilax glauca
Snowberry? ade,5,
Solandra glabra? syd13
Solandra laevis = Solandra longifolia
Solandra nitida = Solandra maxima
Solanum american holly? ade,7,
Solanum argenteum? melb,21,22,
Solanum auriculatum(granulosa)? syd6

Solanum azureum? melb,35,
ade,7,13,18,20,24,26,27,32,31,33,34,36,38,39,44,45,
Solanum hirsutum? melb7
Solanum hystrax(armatum)? syd6
Solanum laciniatum = Solanum aviculare
Solanum lucidum(Solanum brachystachys)? melb5
Solanum spinossimum? ade,5,
Solanum verbascifolium = Solanum erianthum
Solanum warscewiezii = Solanum hispidum
Solanum weatherilli = Solanum pseudocapsicum
Sollya angustifolia = Billardiera scandens
Sollya drummondii = Sollya parviflora
Sophora frazerii? syd18
Sophora grandifloria = Sophora tetraptera
Sorbus fifeana? melb,36,
Sorbus foliofolia? melb,36,
Sorbus halepensis? melb,41,
Sorbus pinnatifida? melb,46,
Sorbus vestita = Sorbus cuspidata
Spartium alba = Cytisus albus
Spartium linifolium = Cytisus linifolius
Spartium multiflorum = Cytisus multiflorus
Spartium scoparium = Cytisus scoparius
Spathodea reedii? syd5,17
Sphaeralcea rosea = Phymosia rosea
Spheralcia umbellata = Phymosia umbellata
Spiraea aitchisoni = Sorbaria aitchisonii
Spiraea anthony waterer = Spiraea Xbumalda
Spiraea arioefolia = Holodiscus discolor
Spiraea assurgens? melb,27,
Spiraea callosa = Spiraea japonica
Spiraea fortuneii = Spiraea japonica
Spiraea gigantea = Filipendula camtschatica
Spiraea gracilis = Deutzia gracilis
Spiraea grandifolia = Sorbaria grandifolia
Spiraea indica = Spiraea canescens
Spiraea laevigata = Siberaea laevigata
Spiraea lindleyana = Sorbaria sorbifolia
Spiraea mexicana? syd8,10
Spiraea nobleana = Spiraea Xsanssouciana
Spiraea nyewoods? melb,46,
Spiraea opulifolia = Physocarpus opulifolius
Spiraea reevesiana = Spiraea cantoniens's
Spiraea rosea = Spiraea densiflora
Spiraea rupestris = Spiraea blumei
Spiraea russeliana? syd6
Spiraea splendens = Spiraea densiflora
Spiraea umbrosa? melb7
Stadmannia australis = Diploglottis australis
Statice = Limonium
Statice arborea = Limonium arborescens
Statice brassicafolia = Limonium brassicifolium
Statice dicksonii = Limonium roseum
Statice halfordii? ade,7,12,13,18,24,
Statice imbricata? melb,28,
Stenanthra pinifolium = Astroloma pinifolium
Stenochilus glaber = Eremophila brownii
Stenochilus laevigatus? syd5
Stenochilus longifolius = Eremophila longifolia
Stenochilus maculatus = Eremophila maculata
Stenochilus viscosus = Eremophila brownii
Stenogasta concinea = Sinningia concinna
Stenolobium alatum = Tecoma alata
Stenolobium satans = Tecoma stans
Stephanandra flexuosa = Stephanandra incisa
Stephanandra hernondifolia = Stephanandra hernandifolia

Stephanotis jasmine = Stephanotis floribunda
Sterculea acerifolia = Brachychiton acerifolia
Sterculea cunninghamii? syd12
Sterculea diversifolia = Brachychiton populneus
Sterculea heterophylla = Brachychiton populneus
Sterculea leichardti? ade,6,
Sterculea lurida = Brachychiton discolor
Sterculea platanifolia = Firmiana simplex
Sterculea populneum = Brachychiton populneus
Stifftia chrysantha = Brazil stifftia
Stillingia sebifera = Sapium sebiferum
Stokesia cynea = Sapium laevis
Stranvaesia salicifolia = Stranvaesia davidiana
Strelitizia angustifolia = Strelitizia reginae
Strelitizia augusta = Strelitizia alba
Strelitizia juncea = Strelitizia reginae
Strelitizia parvifolia = Strelitizia reginae
Strophanthus capensis = Strophanthus speciosa
Struthiopteris germanica? syd26,27 melb,20,22, ade,16,18,20
Styphella incarnata? syd5,14
Swainsona alba = Swainsona galegifolia
Swainsona coronillaefolia = Swainsona galegifolia
Swainsona miniata? syd6
Swainsona osbornei = Swainsona galegifolia
Swainsona pulchella? syd15,17,18,19
Swainsona rollisoni? ade,18,
Swainsona rosea = Swainsona galegifolia
Symphoria racemosa = Symphoricarpos albus
Symphoricarpos racemosa = Symphoricarpos albus
Symphoricarpos variegatus = Symphoricarpos orbiculatus
Symphoricarpos vulgaris = Symphoricarpos orbiculatus
Syncarpia albens? syd5
Syncarpia laurifolia = Syncarpia glomulifera
Syngonium albo-lineatum = Syngonium angustatum
Syngonium frosty? ade,48,
Syringa alba = Syringa vulgaris
Syringa japonica = Syringa reticulata
Syringa siberian = Syringa reticulata
Syringa velutina = Syringa patula
Syringa Xcharlesii? melb9,18,23,24,25,26,31,35,
Tabernaemontana coomosa? syd16,21,26,27,29,30 ade,20,
Tabernaemontana coronoria = Tabernaemontana divaricata
Tabernaemontana cymosa? melb,24,
Tacsonia buchonani = Passiflora vitifolia
Tacsonia eriantha = Passiflora mixta
Tacsonia exoniensis = Passiflora Xexoniensis
Tacsonia ignea = Passiflora manicata
Tacsonia jamiesonii = Passiflora jamesonii
Tacsonia mollisima = Passiflora mollisima
Tacsonia moniculata = Passiflora manicata
Tacsonia mortii? syd8,12,13,15,17,19,21 melb,20,21,22,23,24,25,26,27,28,
ade,13,18,20,
Tacsonia pinnatistipula = Passiflora pinnatistipula
Tacsonia sangwelli? melb,20,
Tacsonia smythiana? syd,29,30,35,37 melb,18,23,24,25,26,27,27,28,
Tacsonia taylori = Passiflora mollisima
Tacsonia tomentosa speciosa = Passiflora mollisima
Tacsonia vem-volvemii = Passiflora antioquiensis
Tacsonia wyldii? ade,13,18,
Tamarindus pinnatus? syd5
Tamarix aestivalis = Tamarix ramosissima
Tamarix algeriensis = Tamarix gallica
Tamarix articula = Tamarix aphylla
Tamarix articulata = Tamarix aphylla
Tamarix glauca? melb,28,
Tamarix japonica = Tamarix chinensis

Tamarix juniperina = Tamarix chinensis
Tamarix odessana rubra = Tamarix ramosissima
Tamarix pentandra = Tamarix ramosissima
Tamarix plumosa = Tamarix chinensis
Tanghinia veneniflua = Tanghinia venenifera
TANGIERINE = Citrus reticulata
Tarrietta australis? ade,12,
Tasmania clipitala (Drimys clipitala)? syd10
Taxodium nutans = Taxodium distichum
Taxodium pinnatum = Taxodium mucronatum
Taxodium sempervirens = Sequoia sempervirens
Taxodium virens = Taxodium distichum
Taxus adpressa = Taxus baccata
Taxus elagantissima = Taxus baccata
Taxus erecta = Taxus baccata
Taxus fastigata = Taxus baccata
Taxus hybernica = Taxus baccata
Taxus japonica = Cephalotaxus drupacea
Taxus nucifera = Glyptostrobus lineatus
Taxus saxegotha conspicua = Saxegothaea conspicua
Taxus totora? syd4
Taxus washingtoniana = Taxus baccata
Tecoma archerii? melb,25, ade,18,
Tecoma australis = Pandorea pandorana
Tecoma capensis = Tecomaria capensis
Tecoma diversifolia = Pandorea pandorana
Tecoma grandiflora = Campsis grandiflora
Tecoma guilfoylei = Campsis Xguilfoylei
Tecoma heterophylla = Tabebuia heterophylla
Tecoma hilli? melb,20,30,
Tecoma hybrida = Campsis Xtagliabuana
Tecoma jasminoides = Pandorea jasminoides
Tecoma latroberii = Pandorea pandorana
Tecoma mackeni = Podranea ricasoliana
Tecoma madam galen = Campsis radicans
Tecoma mollis = Tecoma stans
Tecoma mughus? melb11
Tecoma pulchra? syd15 ade,7,9,12,13,18,24,
Tecoma radicans = Campsis radicans
Tecoma rosea = Tabebuia rosea
Tecoma smithii = Tecoma alata
Tecoma sorbifolia = Tecoma stans
Tecoma speciosa = Tecomanthe speciosa
Tecoma thunbergii? melb,31,
Tecoma valdivianum = Campsidium valdivianum
Tecoma velutina = Tecoma stans
Tecoma venusta = Pyrostegia venusta
Ternstroemia japonica = Ternstroemia gymnanthera
Testuclunaria elephantipes = Dioscorea elephantipes
Tetranthera apetala? melb3
Tetratheca baueraefolia = Tetratheca ciliata
Tetratheca rubioides = Tetratheca ericifolia
Tetratheca verticillata? ade,9,12,
Tetrathera dealbata (Litsea dealbata)? syd6
Tetrathera laurifolia (Litsea sebifera)? syd8
Tetronema mexicana? melb5
Teucrium maritima = Teucrium marum
Thea bohea = Camellia sinensis
Thea sinensis = Camellia sinensis
Thea viridis = Camellia sinensis
Thibaudia acuminata = Cavendishia acuminata
Thryptomene mitchelliana = Thryptomene calycina
Thuja aurea = Platycladus orientalis
Thuja bermudiana? melb7
Thuja beveriensis = Platycladus orientalis
Thuja borealis = Chamaecyparis nootkatensis

Thuja chinese = Platycladus orientalis
Thuja doniana = Libocedrus doniana
Thuja elegantissima = Platycladus orientalis
Thuja falcata = Platycladus orientalis
Thuja flageliformis? syd15,17,18,19
Thuja gigantea = Libocedrus decurrens
Thuja gigantea = Thuja plicata
Thuja glauca = Platycladus orientalis
Thuja intermedia = Platycladus orientalis
Thuja knightii? syd10,15,17,18,19
Thuja lobbii = Thuja plicata
Thuja meldensis = Platycladus orientalis
Thuja microcarpa? melb5
Thuja nepalensis = Platycladus orientalis
Thuja obtusa = Thuja occidentalis
Thuja orientalis = Platycladus orientalis
Thuja tartarica = Platycladus orientalis
Thuja upright? ade,5,
Thuja zebrina = Thuja plicata
Thujopsis borealis = Chamaecyparis nootkatensis
Thujopsis laetevirens = Thujopsis dolabrata
Thujopsis standishii = Thuja standishii
Thunbergia alba = Thuja alata
Thunbergia aurantiaca = Thuja alata
Thunbergia gibsoni = Thunbergia gregorii
Thunbergia harrisii = Thunbergia laurifolia
Thunbergia hatagni? syd15,16,17,19 melb14 ade,12,
Thunbergia javanicum = Thunbergia fragrans
Thymus argentea marginata = Thymus vulgaris
Thymus coccineus = Thymus serpyllum
Thymus nitidus = Thymus richardii
Thymus pauciflorus? syd,36,41,(43) melb,28,
Thyrsacanthus rutilans = Odontonema schomburgkianum
Tibouchina semidecandra = Tibouchina urvilleana
Tilia argentea = Tilia tomentosa
Tilia grandifolia = Tilia platyphyllos
Tilia parmentieri? ade,18,
Tilia rubra = Tilia platyphyllos
Todea africana = Todea barbara
Todea fraseri = Leptopteris fraseri
Todea intermedia = Leptopteris Xintermedia
Todea superba = Leptopteris superba
Torreya myristica = Torreya californica
Toxicaphylla thurbergi = Acokanthera oppositifolia
Toxicophlea spectablis = Acokanthera oblongifolia
Toxicophlea thunbergiana = Acokanthera oppositifolia
TREE TOMATO = Cyphomandra betacea
Trichila glandolosa = Synoum glandulosum
Tristania australis = Tristania conferta
Tryptonema = Thryptomene
Tylophora paniculata? syd5
Ulmus berafidii = Ulmus procera
Ulmus campestris = Ulmus procera
Ulmus candian(giant elm)? syd,23,
Ulmus chicester = Ulmus Xvegeta
Ulmus dalmensis? syd17
Ulmus europea = Ulmus laevis
Ulmus exionensis = Ulmus glabra
Ulmus horizontalis = Ulmus glabra
Ulmus latifolia = Ulmus Xhollandica
Ulmus louis van houtte = Ulmus procera
Ulmus major = Ulmus glabra
Ulmus medio argentea = Ulmus procera
Ulmus montana = Ulmus glabra
Ulmus montana vegeta = Ulmus vegeta
Ulmus monumentalis = Ulmus procera

Ulmus nepelensis? melb3
Ulmus picturata? syd,47, melb,32,36,41,(44a),
Ulmus purpurea = Ulmus carpinifolia
Ulmus scabra = Ulmus glabra
Ulmus siberian? ade,5,
Ulmus sinensis = Ulmus parvifolia
Ulmus suberosa = Ulmus thomasii
Ulmus turkestania? melb,32,36,
Ulmus umbraculifera = Ulmus carpinifolia
Ulmus viminalis = Ulmus procera
Ulmus virgata = Ulmus parvifolia
Ulmus wentworthii = Ulmus procera
Ulmus wreedi aurea = Ulmus Xhollandica
Vernatea longifolia? syd2
Vernonia arborescens? syd13
Veronica angustifolia = Hebe parviflora
Veronica autumn glory = Hebe elliptica
Veronica bolloniensis? ade,33,
Veronica bright? syd17 melb,20,22,27, ade,7,18,24,
Veronica bryanti? syd,36,
Veronica celestial? melb18,23,25,26,27, ade,9,12,13,18,20,24,29,34,
Veronica christenseni? syd,36,
Veronica christica? syd,36,
Veronica cobbi? syd,36,
Veronica coccinea? melb5
Veronica coelestial? syd,24,26,27 melb,31,35,37,
Veronica coerulea? syd17,21
Veronica creme et violet? syd19 melb,23,25,26,33,
ade,7,9,13,18,20,24,29,34,
Veronica decussata = Hebe elliptica
Veronica dieffenbachia? melb,18,23,25 ade,7,13,18,24,
Veronica diversicolor? ade,39,
Veronica gloriosa? ade,36,
Veronica hartiana = Hebe insularis
Veronica hendersonii = Hebe speciosa
Veronica imperialis = Hebe speciosa
Veronica kermesina = Hebe speciosa
Veronica la foe aux roses? melb,20,22,
Veronica latisepala? melb,46,
Veronica lavdiana? ade,9,12,13,18,24,
Veronica leitchfieldii? syd12,17
Veronica lindleyana = Hebe salicifolia
Veronica linifolia = Parahebe linifolia
Veronica lobeliaeoides = Hebe Xblue gem
Veronica perpescanta? syd,36,
Veronica pulchella? melb,21,
Veronica speciosa = Hebe speciosa
Veronica spectablis? syd17
Veronica tricolor? melb,42,
Veronica turnerii? syd17,21
Veronica variblis = Hebe hectorii
Veronica variegata? syd17
Veronica veriscolor? syd10 melb,31, ade,7,18,24,32,33,
Veronica vulcan? ade? 32,33,
Viburnum americanum = Viburnum opulus
Viburnum arboreum? syd4,5,7,8,10 melb3,5,7
Viburnum awafuki = Viburnum odoratissimum
Viburnum fragrans = Viburnum farreri
Viburnum laurustinus = Viburnum tinus
Viburnum lucidum = Viburnum tinus
Viburnum obovata = Viburnum obovatum
Viburnum punctatum = Viburnum nudum
Viburnum reticulatum = Viburnum sieboldii
Viburnum rugosum = Viburnum rigidum
Viburnum russelianum? melb11
Viburnum sinense = Viburnum odoratissimum

Viburnum standishii = Viburnum tinus
Viburnum tomentosum = Viburnum plicatum
Viminaria denuda = Juncea juncea
Vinca alba = Vinca minor
Vinca coerula = Vinca minor
Vinca oculata? melb5
Virgilia lutea = Cladrastis lutea
Virgilia oroboides = Virgilia capensis
Virgilia rubenoides = Virgilia capensis
Vitex acuminata? syd(43)
Vitex amabilis? ade,36,
Vitex arborea = Vitex negundo
Vitex argentea = Vitis agnus-castus
Vitex littoralis? syd5,12,13,17,18,21 melb5,23,25,26,33,35,ade,9,12,24,
Vitex nitens? ade,12,
Vitex ovata = Vitis trifolia
Vitex variegateus = Vitis agnus-castus
Vitis alicante Bouchet = Vitis amurensis
Vitis antarctica = Cissus antarctica
Vitis capensis = Rhoicissus capensis
Vitis heterophylla = Ampelopsis brevipedunculata
Vitis hypoglauca = Cissus hypoglauca
Vitis vitigena? ade,13,
WALNUT (WILSONS WONDER)? ade,27,31,34,38,43,45,
WALNUT(PRE-1890) = Juglans regia
Washingtonia sonorae = Washingtonia robusta
Webbia canariensis = Hypericum canariense
Weigela abel cariiere = Weigela floribunda
Weigela alba = Weigela floribunda
Weigela amabilis = Weigela coraeensis
Weigela arborea grandiflora = Weigela coraeensis
Weigela argentea-marginata? melb,46, ade,38,39,
Weigela augustus wilhelm? syd21,26,27,29 melb18,23, ade,18,24,
Weigela bristol ruby? melb,43,
Weigela cameleon? melb,36,
Weigela candidissima = Weigela florida
Weigela canida = Weigela florida
Weigela conquete = Weigela praecox
Weigela doctor baillon? melb,23,25,26,
Weigela Eva Rathae = Weigela florida
Weigela gigantifora? melb,36,41,
Weigela gloire des bosquets? syd,26,27,29,30,36,41,44
melb,18,22,23,25,26,27,
Weigela hendersonii = Weigela florida
Weigela heroine? melb,31,35,
Weigela isoline = Weigelia florida
Weigela jean mace? syd21,24 melb18,20,22,23,25,26,27,28, ade,18,
Weigela lavallei = Weigela Xwagneri
Weigela le printempts = Weigela praecox
Weigela lemonii? syd18,20,23,27 melb6,18,22,23, ade,9,12,13,
Weigela longifolia? melb,20,21,
Weigela luteo-marginata? melb,46,
Weigela montesquieu? syd21,26 melb18,20,22,23,25,26,27,
Weigela opulus? melb,41,
Weigela purpurata? syd17,21,26 melb18,23,25,26,41, ade,9,12,13,18,24,32,33,
Weigela rosea = Weigela florida
Weigela sieboldti? melb,20,22,23,25,26,
Weigela splendens = Diervilla Xsplendens
Weigela van houttii = Weigela florida
Weigela variegata = Weigela florida
Weigela verschaffetti = Weigela florida
Weigela Xlowii? melb,18,
Wellingtonia gigantea = Sequoiadendron giganteum
Westringia floribunda? syd,47,
Wigandia chilensis? melb,18,23,25,26,
Wigandia floribunda? ade,24,

Wigandia hybrida? melb,18,
Wigandia imperialis? syd18 melb,23,25,26, ade,18,24,
Wigandia vigeri = Wigandia caracasana
WILLOW? syd1
Wisteria alba? melb,30 ade,26,27,31,34,
Wisteria bidwillii? syd13,15,16,19
Wisteria canadensis? syd6
Wisteria chinensis = Wisteria sinensis
Wisteria consequana = Wisteria sinensis
Wisteria harrisonii? syd5
Wisteria hendersonii? syd8
Wisteria magnifica = Wisteria macrostachya
Wisteria mangospermum? syd8
Wisteria multijuga = Wisteria floribunda
Wisteria noda alba? melb,25,26,
Wisteria purpurea = Wisteria floribunda
Wisteria rosea = Wisteria floribunda
Wisteria zealandia? syd33
Withania originifolia? melb,23,25,26, ade,7,24,
Witheringia superbra? melb3 ade,12,
Woodwardia erecta? syd16,19
Woodwardia japonica = Woodwardia orientalis
Xanthorrhoea hastilis = Xanthorrhoea resinosa
Xylosma senticosum = Xylosma congestum
Yucca bowiena? syd47
Yucca crenulata = Yucca aloifolia
Yucca draconis = Yucca aloifolia
Yucca gigantea = Yucca elephantipes
Yucca quadricolor = Yucca aloifolia
Yucca serrulata = Yucca aloifolia
Yucca superbra = Yucca gloriosa
Yucca tricolor = Yucca aloifolia
Yucca variegata = Yucca aloifolia
Zambia australis? syd8
Zambia mackenzieii = Macrozamia spiralis
Zambia revoluta? syd10
Zambia spiralis = Macrozamia communis
Zelkova acuminata = Zelkova serrulata
Zichya molle = Kennedia coccinea
Zieria lanceolata = Zieria smithii
Ziziphus chinensis = Ziziphus jujuba
Ziziphus vulgaris = Ziziphus paliurus

APPENDIX 6: The Synonym names of species listed in Appendices 1-4.

Laburnum adamii	=	+Laburnocytisus adamii
Cytisus adamii	=	+Laburnocytisus adamii
Pithicolobium grandiflorum	=	Abarema grandiflora
Pithicolobium pruinosum	=	Abarema sapindoides
Abelia rupestris	=	Abelia chinensis
Abelia longituba	=	Abelia schumanni
Abelia 'edward Goucher'	=	Abelia Xgrandifolia
Hibiscus manihot	=	Abelmoschus manihot
Hibiscus palmatus	=	Abelmoschus manihot
Hibiscus abelmoschus	=	Abelmoschus moschatus
Abies pectinata	=	Abies alba
Picea amabilis	=	Abies amabilis
Picea balsamea	=	Abies balsamea
Picea fraseri	=	Abies fraseri
Pinus grandis	=	Abies grandis
Abies brachyphylla	=	Abies homolepis
Pinus amabilis	=	Abies lasiocarpa
Abies arozonica	=	Abies lasiocarpa
Picea Nordmanniana	=	Abies nordmanniana
Picea pindrow	=	Abies pindrow
Pinus pindrow	=	Abies pindrow
Picea pinsapo	=	Abies pinsapo
Picea nobilis	=	Abies procera
Abies nobilis	=	Abies procera
Picea webbiana	=	Abies spectabilis
Pinus webbiana	=	Abies spectabilis
Abrobra viridiflora	=	Abrobra tenuifolia
Abutilon vexillarium	=	Abutilon megapotamicum
Abutilon aureum variegatum	=	Abutilon pictum
Abutilon rosaeflorum	=	Abutilon pictum
Abutilon striatum	=	Abutilon pictum
Abutilon Thompsonii	=	Abutilon pictum
Abutilon marmorata	=	Abutilon sellovianum
Abutilon emperor	=	Abutilon vesuvius
Abutilon orange king	=	Abutilon vitifolium
Abutilon eclipse	=	Abutilon Xhybridum
Abutilon savitzii	=	Abutilon Xhybridum
Abutilon souvenir de Bonn	=	Abutilon Xhybridum
Acacia latrobeli	=	Acacia acinacea
Acacia megaphylla	=	Acacia anceps
Acacia ornithophora	=	Acacia armata
Acacia undulata	=	Acacia armata
Acacia argophylla	=	Acacia brachybotrya
Acacia nematophylla	=	Acacia calamifolia
Acacia normalis	=	Acacia decurrens
Acacia neriifolia	=	Acacia iteaphylla
Acacia pinifolia	=	Acacia juncifolia
Acacia acicularis	=	Acacia juniperina
Acacia Brownii	=	Acacia juniperina
Acacia ruscifolia	=	Acacia juniperina
Acacia verticilata	=	Acacia juniperina
Acacia abietina	=	Acacia linearis
Acacia angustifolia	=	Acacia longifolia
Acacia mucronata	=	Acacia longifolia
Acacia sophora	=	Acacia longifolia
Acacia linearis	=	Acacia longissima
Acacia mollisima	=	Acacia mearnsii
Acacia clavata	=	Acacia montana
Acacia celastrifolia	=	Acacia myrtifolia
Acacia rutaefolia	=	Acacia nigricans
Mimosa nilotica	=	Acacia nilotica

Acacia arabica	=	Acacia nilotica
Acacia vera	=	Acacia nilotica
Acacia discolor	=	Acacia panniculata
Acacia maritima	=	Acacia panniculata
Acacia sowdenii	=	Acacia papyrocarpa
Acacia parvissima	=	Acacia pravissima
Acacia amona	=	Acacia rubida
Acacia cyanophylla	=	Acacia saligna
Acacia botrycephala	=	Acacia terminalis
Acacia elata	=	Acacia terminalis
Acacia sertiformis	=	Acacia undulifolia
Acacia exsudans	=	Acacia verniciflua
Acalypha sanderana	=	Acalypha hispida
Acalypha marginata	=	Acalypha wilkesiana
Acalypha musaica	=	Acalypha wilkesiana
Acalypha tricolor	=	Acalypha wilkesiana
Cactus quadrangularis	=	Acanthocereus pentagonus
Aralia pentaphylla	=	Acanthopanax spinosum
Acanthus spinosus	=	Acanthus spinosissimus
Acer floridanum	=	Acer barbatum
Acer trifidum	=	Acer buergeranum
Acer colchicum	=	Acer cappadocicum
Acer lacinatum	=	Acer japonicum
Negundium americanum	=	Acer negundo
Negundo fraxinifolia	=	Acer negundo
Acer argentea variegata	=	Acer negundo
Acer fraxinifolium	=	Acer negundo
Acer neapolitana	=	Acer opalus
Acer opulifolium	=	Acer opulus
Acer polymorhum	=	Acer palmatum
Acer purpurea	=	Acer palmatum
Acer seigan	=	Acer palmatum
Acer schwedlerii	=	Acer platanoides
Acer albo variegatum	=	Acer pseudoplatanus
Acer leopoldi	=	Acer pseudoplatanus
Acer drummondii	=	Acer rubrum
Acer dasycarpum	=	Acer saccharinum
Acer virginicum	=	Acer saccharinum
Acer mono	=	Acer truncatum
Eugenia ellipitica	=	Acmena smithii
Eugenia smithii	=	Acmena smithii
Acmena elliptica	=	Acmena smithii
Acmena floribunda	=	Acmena smithii
Acmena kingiana	=	Acmena smithii
Toxicophlea spectablis	=	Acokanthera oblongifolia
Acokanthera spectabilis	=	Acokanthera oblongifolia
Carissa spectabilis	=	Acokanthera oblongifolia
Toxicaphylla thurbergi	=	Acokanthera oppositifolia
Toxicophlea thunbergiana	=	Acokanthera oppositifolia
Acronychia laevis	=	Acronychia oblongifolia
Sempervivum arborescens	=	Aeonium arborescens
Aeschynanthus zebrina	=	Aeschynanthus marmorata
Aeschynanthus grandiflorus	=	Aeschynanthus parasiticus
Aeschynanthus rammossimma	=	Aeschynanthus parasiticus
Pavia californica	=	Aesculus californica
Aesculus flava	=	Aesculus octandra
Pavia macrostachya	=	Aesculus parviflora
Aesculus briotii	=	Aesculus Xcarnea
Aesculus rubicunda	=	Aesculus Xcarnea
Pentaptergium serpens	=	Agapetes serpens
Dammara	=	Agathis
Diosma complexa	=	Agathosma capensis
Agathosma villosa	=	Agathosma corymbosa
Diosma pulchrum	=	Agathosma pulchrum
Andromeda buxifolia	=	Agauria buxifolia
Agave glaucescens	=	Agave attenuata

Acacia arabica	=	Acacia nilotica
Acacia vera	=	Acacia nilotica
Acacia discolor	=	Acacia panniculata
Acacia maritima	=	Acacia panniculata
Acacia sowdenii	=	Acacia papyrocarpa
Acacia parvissima	=	Acacia pravissima
Acacia amona	=	Acacia rubida
Acacia cyanophylla	=	Acacia saligna
Acacia botrycephala	=	Acacia terminalis
Acacia elata	=	Acacia terminalis
Acacia sertiformis	=	Acacia undulifolia
Acacia exsudans	=	Acacia verniciflua
Acalypha sanderana	=	Acalypha hispida
Acalypha marginata	=	Acalypha wilkesiana
Acalypha musaica	=	Acalypha wilkesiana
Acalypha tricolor	=	Acalypha wilkesiana
Cactus quadrangularis	=	Acanthocereus pentagonus
Aralia pentaphylla	=	Acanthopanax spinosum
Acanthus spinosus	=	Acanthus spinosissimus
Acer floridanum	=	Acer barbatum
Acer trifidum	=	Acer buergeranum
Acer colchicum	=	Acer cappadocicum
Acer lac atum	=	Acer japonicum
Negundium americanum	=	Acer negundo
Negundo fraxinifolia	=	Acer negundo
Acer argentea variegata	=	Acer negundo
Acer fraxinifolium	=	Acer negundo
Acer neapolitana	=	Acer opalus
Acer opulifolium	=	Acer opulus
Acer polymorhum	=	Acer palmatum
Acer purpurea	=	Acer palmatum
Acer seigan	=	Acer palmatum
Acer schwedlerii	=	Acer platanoides
Acer albo variegatum	=	Acer pseudoplatanus
Acer leopoldi	=	Acer pseudoplatanus
Acer drummondii	=	Acer rubrum
Acer dasycarpum	=	Acer saccharinum
Acer virginicum	=	Acer saccharinum
Acer mono	=	Acer truncatum
Eugenia ellipitica	=	Acmena smithii
Eugenia smithii	=	Acmena smithii
Acmena elliptica	=	Acmena smithii
Acmena floribunda	=	Acmena smithii
Acmena kingiana	=	Acmena smithii
Toxicophlea spectablis	=	Acokanthera oblongifolia
Acokanthera spectabilis	=	Acokanthera oblongifolia
Carissa spectabilis	=	Acokanthera oblongifolia
Toxicaphylla thurbergi	=	Acokanthera oppositifolia
Toxicophlea thunbergiana	=	Acokanthera oppositifolia
Acronychia laevis	=	Acronychia oblongifolia
Sempervivum arborescens	=	Aeonium arborescens
Aeschynanthus zebrina	=	Aeschynanthus marmorata
Aeschynanthus grandiflorus	=	Aeschynanthus parasiticus
Aeschynanthus rammossimma	=	Aeschynanthus parasiticus
Pavia californica	=	Aesculus californica
Aesculus flava	=	Aesculus octandra
Pavia macrostachya	=	Aesculus parviflora
Aesculus briotii	=	Aesculus Xcarnea
Aesculus rubicunda	=	Aesculus Xcarnea
Pentaptergium serpens	=	Agapetes serpens
Dammara	=	Agathis
Diosma complexa	=	Agathosma capensis
Agathosma villosa	=	Agathosma corymbosa
Diosma pulchrum	=	Agathosma pulchrum
Andromeda buxifolia	=	Agauria buxifolia
Agave glaucescens	=	Agave attenuata

Agave filamentosa	=	Agave filifera
Agave mexicana	=	Agave picta
Agave verschaffelti	=	Agave potatorum
Agave seemeni	=	Agave seemanniana
Ailanthus glandulosa	=	Ailanthus altissima
Akebia lobata	=	Akebia trifoliata
Acacia lophantha	=	Albizia distachya
Albizia lophantha	=	Albizia distachya
Acacia julibrissin	=	Albizia julibrissin
Acacia nemu	=	Albizia julibrissin
Electron	=	Alectryon
Nephelium lieocarpum	=	Alectryon subcinereus
Aleurites triloba	=	Aleurites moluccana
Allamanda aubletii	=	Allamanda cathartica
Allamanda grandiflora	=	Allamanda cathartica
Allamanda hendersonii	=	Allamanda cathartica
Allamanda nobilis	=	Allamanda cathartica
Allamanda pubescens	=	Allamanda cathartica
Allamanda schottii	=	Allamanda cathartica
Allamanda wardlyana	=	Allamanda cathartica
Alnus laciniata	=	Alnus incana
Alocasia metalillica	=	Alocasia indica
Aloe frutescens	=	Aloe arborescens
Aloe flava	=	Aloe barbadensis
Aloe vulgaris	=	Aloe barbadensis
Aloe prolifera	=	Aloe brevifolia
Aloe pseudo-ferox	=	Aloe ferox
Aloe umbellata	=	Aloe saponaria
Aloe hanburiana	=	Aloe striata
Aloe socotrina	=	Aloe succotrina
Aloe fulgens	=	Aloe Xprincipis
Lippia citriodora	=	Aloysia triphylla
Aloysia bergamont	=	Aloysia triphylla
Aloysia citriodora	=	Aloysia triphylla
Alpinia nutans	=	Alpinia zerumbet
Dicksonia cunninghami	=	Alsophila cunninghami
Alsophila macatheruri	=	Alsophila leichlardtiana
Dicksonia smithii	=	Alsophila smithii
Hemitelia smithi	=	Alsophila smithii
Cyathea dealbata	=	Alsophila tricolor
Fugosia hakaefolia	=	Alyogyne hakeifolia
Hibiscus hakeafolia	=	Alyogyne hakeifolia
Cienfugosia hakeaefolia	=	Alyogyne hakeifolia
Alyxia tetragonia	=	Alyxia spicata
Mespilus nivea	=	Amelanchier canadensis
Amorpha lewisii	=	Amorpha fruticosa
Ampelopsis dissecta	=	Ampelopsis aconitifolia
Cissus heterophylla	=	Ampelopsis brevifolia
Vitis heterophylla	=	Ampelopsis brevipedunculata
Bignonia chamberlaynii	=	Anemopaegma chamberlaynii
Angophora lanceolata	=	Angophora costata
Metrosideros floribunda	=	Angophora intermedia
Cristaria capensis	=	Anisodontea scabrosa
Cherimoyer	=	Annona cherimola
Boussingaultia baselloides	=	Anredera cordifolia
Aotus villosa	=	Aotus ericoides
Aphelandra roezlii	=	Aphelandra aurantiaca
Aphelandra dania	=	Aphelandra squarrosa
Aphelandra Leopoldi	=	Aphelandra squarrosa
Aphelandra cristata	=	Aphelandra tetragona
Cactus flagelliformis	=	Aporocactus flagelliformis
Cereus flagelliformis	=	Aprocactus flagelliformis
Dimorphanthus mandschuricus	=	Aralia elata
Araucaria braziliana	=	Araucaria angustifolia
Araucaria imbricata	=	Araucaria araucana
Eutassia simpsoniana	=	Araucaria columnaris

Araucaria cooki	=	Araucaria columnaris
Araucaria gluaca	=	Araucaria cunninghamii
Eutassia excelsa	=	Araucaria heterophylla
Araucaria excesla	=	Araucaria heterophylla
Physianthus albus	=	Araujia sericifera
Schubertia graveolens	=	Araujia sericifera
Psychosperma alexandra	=	Archontophoenix alexandrae
Ptychosperma alexandrae	=	Archontophoenix alexandrae
Seaforthia elegans	=	Archontophoenix cunninghamiana
Ardisia crenulata	=	Ardisia crenata
Ardisia lutea	=	Ardisia crenata
Cocus australis	=	Arecastrum romanzoffianum
Cocus flexuosa	=	Arecastrum romanzoffianum
Cocus plumosus	=	Arecastrum romanzoffianum
Aristolochia sipho	=	Aristolochia durior
Aristolochia cliata	=	Aristolochia fimbriata
Aristolochia gigantea	=	Aristolochia grandiflora
Aronia floribunda	=	Aronia prunifolia
Artabotrys odaratissima	=	Artabotrys hexapetalus
Artemisia argentea	=	Artemisia arborescens
JACKFRUIT	=	Artocarpus heterophyllus
Artocarpus integrifolia	=	Artocarpus integrifolia
Bambusa nana	=	Arundinaria disticha
Bambusa fortunei variegata	=	Arundinaria variegata
Bambusa auricoma	=	Arundinaria viridi-striata
Arundo variegata	=	Arundo donax
Maurandya alba	=	Asarina barclaiana
Maurandya barclayana	=	Asarina barclaiana
Maurandya rosea	=	Asarina barclaiana
Maurandya semperflorens	=	Asarina barclaiana
Lophospermum hendersonii	=	Asarina erubescens
Lophospermum scandens	=	Asarina erubescens
Asclepias nivea	=	Asclepias exaltata
Gomphocarpus fruticosus	=	Asclepias fruticosus
Gomphocarpus arborescens	=	Asclepias rotundifolia
Anona triloba	=	Asimina triloba
Medeola asparagoides	=	Asparagus asparagoides
Medeola smilax	=	Asparagus asparagoides
Myrsiphyllum asparagoides	=	Asparagus asparagoides
Asparagus myrtifolia	=	Asparagus asparagoides
Asparagus decumbens	=	Asparagus crispus
Asparagus myerii	=	Asparagus densiflorus
Asparagus sprengeri	=	Asparagus densiflorus
Asparagus tenuissima	=	Asparagus densiflorus
Aspidistra lurida	=	Asparagus elatior
Asparagus camoriensis	=	Asparagus setaceus
Asparagus plumosus	=	Asparagus setaceus
Felicia petiolata	=	Aster petiolata
Felicia petiolata	=	Aster petiolates
Felicia rotundifolia	=	Aster rotundifolius
Phebalium asteriscophorum	=	Asterolasia asteriscophora
Stenanthra pinifolium	=	Astroloma pinifolium
Henfreya scandens	=	Asystasia scandens
Aucuba femina	=	Aucuba japonica
Aucuba limbata	=	Aucuba japonica
Aucuba longifolia	=	Aucuba japonica
Aucuba macrophylla	=	Aucuba japonica
Aucuba mascula	=	Aucuba japonica
Libocedrus chiliensis	=	Austrocedrus chilensis
Myrtus tenuifolia	=	Austromyrtus tenuifolia
Leptospermum imbricatum	=	Baeckea camphorosmae
Bambusa alphonse karri	=	Bambusa glaucescens
Arundinara gracilis	=	Bambusa gracilis
Bambusa humilis	=	Bambusa vulgaris
Bambusa stricta	=	Bambusa vulgaris
Banksia prionophylla	=	Banksia collina

Banksia praemosa	=	Banksia marcescens
Banksia australis	=	Banksia marginata
Banksia latifolia	=	Banksia robur
Banksia hookerii	=	Banksia solanderi
Barleia coerulea	=	Barleria strigosa
Bauera humilis	=	Bauera rubioides
Bauhinia pubescens	=	Bauhinia aculeata
Bauhinia Galpinii	=	Bauhinia punctata
Bauhinia parviflora	=	Bauhinia racemosa
Bauhinia longipes	=	Bauhinia reniformis
Bauhinia alba	=	Bauhinia variegata
Dasylirion gracilis	=	Beaucarnea gracilis
Begonia lucerna	=	Begonia corallina
Begonia floribunda	=	Begonia foliosa
Begonia fuschiodes	=	Begonia foliosa
Begonia discolor	=	Begonia grandis
Begonia aculitii	=	Begonia maculata
Begonia argyrostigma	=	Begonia maculata
Begonia nitida	=	Begonia odorata
Begonia longipes	=	Begonia reniformis
Begonia zebrina	=	Begonia stipulacea
Begonia daedalia	=	Begonia strigillosa
Begonia richardsiana	=	Begonia suffruticosa
Begonia meyersii	=	Begonia tomentosa
Berberis buxifolia	=	Berberis dulcis
Berberis aristata	=	Berberis floribunda
Berberis asiaticus	=	Berberis hookeri
Berberis macrophylla	=	Berberis hookeri
Berberis walcherii	=	Berberis hookeri
Berberis taylorii	=	Berberis pratii
Berberis polyantha	=	Berberis prattii
Berberis sinensis	=	Berberis thunbergia
Berberis little favourite	=	Berberis thunbergii
Berberis asperma	=	Berberis vulgaris
Berberis atropurpurea	=	Berberis vulgaris
Berberis communis	=	Berberis vulgaris
Berberis crataegina	=	Berberis vulgaris
Berberis nepaulensis	=	Berberis vulgaris
Berberis Xneuberti	=	Berberis vulgaris X Mahonia aquifolium
Berberis latifolia	=	Berberis vulgaris X Mahonia aquifolium
Berberis coryi	=	Berberis wilsoniae
Berberis subcaulialata	=	Berberis wilsoniae
Berberis autumn cheer	=	Berberis Xcarminea
Berberis priate king	=	Berberis Xcarminea
Betula lutea	=	Betula alleghaniensis
Betula alba	=	Betula pendula
Betula laciniata	=	Betula pendula
Betula populifera	=	Betula pendula
Betula pyramidalis	=	Betula pendula
Betula verrucosa	=	Betula pendula
Betula japonica	=	Betula platyphylla
Betula szechuanica	=	Betula platyphylla
Betula urticaefolia	=	Betula pubescens
Sollya angustifolia	=	Billardiera scandens
Billardiera mutabilis	=	Billardiera scandens
Marianthus bignoniaceus	=	Billardoera bignoniacea
Lomaria procera	=	Blechnum capense
Lomaria cartalaginea	=	Blechnum cartilagineum
Lomaria dalgairnseli	=	Blechnum dalgairnseli
Lomaria discolor	=	Blechnum discolor
Lomaria falcata	=	Blechnum discolor
Lomaria fluviatilla	=	Blechnum fluviatile
Lomaria fraserii	=	Blechnum fraserii
Lomaria gibba	=	Blechnum gibbum

Lomaria ciliata	=	Blechnum moorei
Lomaria patersoni	=	Blechnum patersonii
Lomaria alpina	=	Blechnum pennamarina
Blechnum striatum	=	Blechnum serrulatum
Lomaria vulcanica	=	Blechnum vulcanicum
Boronia triphylla	=	Boronia ledifolia
Boronia lutea	=	Boronia megastigma
Derringia amberst variegata	=	Bosea amberstiana
Bossiaea microphylla	=	Bossiaea obcordata
Buginvilla	=	Bougainvillea
Bougainvillea cypheri	=	Bougainvillea glabra
Bougainvillea magnifica	=	Bougainvillea glabra
Bougainvillea marginata	=	Bougainvillea glabra
Bougainvillea sanderiana	=	Bougainvillea glabra
Bougainvillea brazillensis	=	Bougainvillea spectabilis
Bougainvillea lateritia	=	Bougainvillea spectabilis
Bougainvillea rosea	=	Bougainvillea spectabilis
Bougainvillea speciosa	=	Bougainvillea spectabilis
Bougainvillea splendens	=	Bougainvillea spectabilis
Bougainvillea Thomasii	=	Bougainvillea spectabilis
Bougainvillea louis wathen	=	Bougainvillea Xbuttiana
Bougainvillea Mrs Butt	=	Bougainvillea Xbuttiana
Bouvardia splendens	=	Bouvardia tenifolia
Bouvardia triphylla	=	Bouvardia tenifolia
Bouvardia jacquini	=	Bouvardia ternifolia
Bouvardia vreelandii	=	Bouvardia xdavisoni
Sterculea acerifolia	=	Brachychiton acerifolia
Brachychiton flammum	=	Brachychiton acerifolius
Sterculea lurida	=	Brachychiton discolor
Brachychiton luridus	=	Brachychiton discolor
Sterculea diversifolia	=	Brachychiton populneus
Sterculea heterophylla	=	Brachychiton populneus
Sterculea populneum	=	Brachychiton populneus
Brachychiton diversifolia	=	Brachychiton populneus
Brachychiton heterophyllum	=	Brachychiton populneus
Delabechea rupestris	=	Brachychiton rupestris
Brahea glauca	=	Brahea armata
Brahea roezii	=	Brahea armata
Schefflera actinophyllaa	=	Brassaia actinophyllaa
Stifftia chrysantha	=	Brazil stifftia
Phyllanthus atropurpurens	=	Breynia disticha
Phyllanthus nivosus	=	Breynia disticha
Phyllanthus rosea	=	Breynia disticha
Morus australis	=	Broussonetia papyrifera
MULBERRY: PAPER	=	Broussonetia papyrifera
Browalia roezli	=	Browalia grandiflora
Datura cornigera	=	Brugmansia arborea
Brugmansia knightii	=	Brugmansia arborea
Brugmansia bicolor	=	Brugmansia sanguinea
Brunfelsia pohliana	=	Brunfelsia acuminata
Brunfelsia confertifolia	=	Brunfelsia calycina
Brunfelsia lindenii	=	Brunfelsia pauciflora
Franciscea	=	Brunsfelsia
Franciscea confertiflora	=	Brunsfelsia pauciflora
Franciscea exima	=	Brunsfelsia pauciflora
Franciscea macrantha	=	Brunsfelsia pauciflora
Franciscea Hopeana	=	Brunsfelsia uniflora
Buddleia neemda	=	Buddleia asiatica
Buddleia panniculata	=	Buddleia crispa
Buddleia ille de france	=	Buddleia davidii
Buddleia magnifica	=	Buddleia davidii
Buddleia nanhoensis	=	Buddleia davidii
Buddleia royal purpurea	=	Buddleia davidii
Buddleia variabilis	=	Buddleia davidii
Buddleia veitchiana	=	Buddleia davidii
Buddleia heterophylla	=	Buddleia madagascariensis

Burchellia capensis	=	Burchellia bubalina
Cocus cornata	=	Butia capitata
Cocus yattai	=	Butia Yatay
Buxus arborescens	=	Buxus sempervirens
Buxus aurea varigata	=	Buxus sempervirens
Buxus elegantissima	=	Buxus sempervirens
Buxus latifolia	=	Buxus sempervirens
Buxus longifolia	=	Buxus sempervirens
Buxus suffruticosa	=	Buxus sempervirens
Guillandina bondue	=	Caesalpinia bonducella
Poinciana gilliesi	=	Caesalpinia gilliesii
Poinciana pulcherrima	=	Caesalpinia pulcherrima
Cisalpina tara	=	Caesalpinia tara
Inga haematoxylon	=	Calliandra haematocephala
Acacia venusta	=	Calliandra portoricensis
Inga portoricensis	=	Calliandra portoricensis
Inga pulcherima	=	Calliandra tweedii
Callicarpa Giraldiana	=	Callicarpa bodinieri
Callicarpa purpurea	=	Callicarpa dichotoma
Callistemon acerosus	=	Callistemon brachyandrus
Callistemon endeavor	=	Callistemon citrinus
Callistemon endeavour	=	Callistemon citrinus
Callistemon lanceolatus	=	Callistemon citrinus
Callistemon coccineus	=	Callistemon macropunctatus
Callistemon rugulosum	=	Callistemon macropunctatus
Callistemon arborescens	=	Callistemon pinifolius
Melaleuca paludosa	=	Callistemon salignus
Metrosideros virdiflorus	=	Callistemon salignus
Metrosideros speciousus	=	Callistemon speciosus
Callistemon "Captain Cook"	=	Callistemon viminalis
Callistemon hannah	=	Callistemon viminalis
Frenela fruticosa	=	Callitris calcarata
Callitris glauca	=	Callitris columelaris
Callitris calcarata	=	Callitris endlicheri
Callitris pyramidalis	=	Callitris endlicheri
Callitris robusta(cat syd36)	=	Callitris endlicheri
Callitris sp.(Murrumbidgee)	=	Callitris endlicheri
Frenella pyramidis	=	Callitris endlicheri
Callitris sp.(Van Diemens land)	=	Callitris gunnii
Frenella gunnii	=	Callitris gunnii
Cupressus huegelii	=	Callitris huegelii
Octoclinus macleayana	=	Callitris macleayana
Leichardtia macleayana	=	Callitris macleayana
Frenella australis	=	Callitris oblonga
Callitris propinqua	=	Callitris preissii
Callitris robusta	=	Callitris preissii
Callitris verrocosa	=	Callitris preissii
Callitris arenosa	=	Callitris rhomboidea
Callitris cupressiformis	=	Callitris rhomboidea
Callitris tasmanica	=	Callitris rhomboidea
Cupressus australis	=	Callitris rhomboidea
Frenalla cupressiformis	=	Callitris rhomboidea
Erica vulgaris	=	Calluna vulgaris
Libocedrus decurrens	=	Calocedrus decurrens
Leucophyta brownii	=	Calocephalus brownii
Ipomoea grandiflora	=	Calonyction aculeatum
Calothamnus clavatus	=	Calothamnus quadrifidus
Chimonanthus floridus	=	Calycanthus floridus
Calycanthus macrophyllus	=	Calycanthus occidentalis
Cytisus spinosa	=	Calycotome spinosa
Calistegia pubescens	=	Calystegia hederacea
Calystegia pubescens	=	Calystegia hederacea
Lhotskya genetylloides	=	Calytrix alpestris
Calytrix ericoides	=	Calytrix tetragona
Calytrix scabra	=	Calytrix tetragona
Camellia anemoniflora	=	Camellia japonica

Camellia myrtifolia	=	Camellia japonica
Camellia paeonifolia	=	Camellia japonica
Thea bohea	=	Camellia sinensis
Thea sinensis	=	Camellia sinensis
Thea viridis	=	Camellia sinensis
Tecoma valdivianum	=	Campsidium valdivianum
Tecoma grandiflora	=	Campsis grandiflora
Bignonia grandiflora	=	Campsis grandiflora
Tecoma madam galen	=	Campsis radicans
Tecoma radicans	=	Campsis radicans
Bignonia floribunda	=	Campsis radicans
Bignonia maden galen	=	Campsis radicans
Bignonia radicans	=	Campsis radicans
Tecoma guilfoylei	=	Campsis Xguilfoylei
Bignonia guilfoylei	=	Campsis Xguilfoylei
Bignonia hybrida grandiflora	=	Campsis Xguilfoylei
Tecoma hybrida	=	Campsis Xtagliabuana
Cantua dependens	=	Cantua buxifolia
PAWPAW	=	Carica papaya
Carica candamarcensis	=	Carica pubescens
Arduina bispinosa	=	Carissa bispinosa
Carissa arduinea	=	Carissa bispinosa
Carissa brownii	=	Carissa lanceolata
Carmichaelia australis	=	Carmichaelia arborea
HORNBEAM	=	Carpinus betulus
Carpinus americanus	=	Carpinus caroliniana
Carpodonales seratus	=	Carpodetus seratus
Carya microcarpa	=	Carya glabra
PECAN	=	Carya illinoinensis
Carya oliviformis	=	Carya illinoinensis
Carya sulcata	=	Carya laciniosa
Carya alba	=	Carya tomentosa
HICKORY NUT	=	Carya tomentosa
Juglans alba	=	Carya tomentosa
Caryopteris mastacanthus	=	Caryopteris incana
Caryopteris tangutica	=	Caryopteris incana
Caryota sebolifera	=	Caryota mitis
Cassia candolleana	=	Cassia bicapsularis
Cassia capensis	=	Cassia bicapsularis
Cassia nemophila	=	Cassia eremophila
Cathartocarpus fistula	=	Cassia fistula
Cassia grandiflora	=	Cassia laevigata
Cassia merrylantica	=	Cassia marilandica
Cassia coromandeliana	=	Cassia planitiicola
Cassia schinifolia	=	Cassia planitiicola
Cassia sophora	=	Cassia planitiicola
Cathartocarpus roxburghii	=	Cassia roxburghii
Cassia glauca	=	Cassia surattensis
Elaeodendron australe	=	Cassine australis
Castanea vesca	=	Castanea sativa
Quercus cuspidata	=	Castanopsis cuspidata
Casuarina igida	=	Casuarina distyla
Casuarina indica	=	Casuarina equisetifolia
Casuarina eptodada	=	Casuarina littoralis
Casuarina uberosa	=	Casuarina littoralis
Casuarina epidophloia	=	Casuarina stricta
Casuarina uadrivalus	=	Casuarina stricta
Casuarina enuissma	=	Casuarina torulosa
Catalpa syringifolia	=	Catalpa bignonioides
Catalpa duclouxii	=	Catalpa fargesii
Catalpa kaempferi	=	Catalpa ovata
Bignonia catalpa	=	Catalpa syringaefolia
Catalpa japonica	=	Catalpa Xhybrida
Thibaudia acuminata	=	Cavendishia acuminata
Ceanothus azureus	=	Ceanothus coeruleus
Ceanothus floribunda	=	Ceanothus dentatus

Ceanothus divaricatus	=	Ceanothus leucodermis
Ceanothus roweneana	=	Ceanothus papillosus
Ceanothus albus	=	Ceanothus rigidus
Ceanothus Gloire de versailles	=	Ceanothus Xdelilianus
Ceanothus marie simon	=	Ceanothus Xdelilianus
Ceanothus Xarnoldii	=	Ceanothus Xdelilianus
Dracocephalum canariense	=	Cedronella canariense
Eriodendron anfractuosum	=	Ceiba pentandra
Celtis mississippiensis	=	Celtis laevigata
Celtis orientalis	=	Celtis occidentalis
Cereus crenulata	=	Cephalocereus lanuginosus
Taxus japonica	=	Cephalotaxus drupacea
Cephalotaxus drupacea	=	Cephalotaxus harringtonia
Plumbago larpentae	=	Ceratostigma plumbaginoides
JUDAS TREE	=	Cercis siliquastrum
Cereus quadrangularis	=	Cereus variabilis
Cereus speciosis	=	Cereus variabilis
Cestrum purpureum	=	Cestrum elegans
Habrothamus elegans	=	Cestrum elegans
Habrothamus corymbosus	=	Cestrum endlicheri
Habrothamus fasicularis	=	Cestrum fasciculatum
Habrothamus newellii	=	Cestrum newellii
Habrothamus scaber	=	Cestrum scaber
Pyrus japonica	=	Chaenomeles japonica
Pyrus maulei	=	Chaenomeles japonica
Cydonia japonica	=	Chaenomeles japonica
Chaenomeles nivalis	=	Chaenomeles speciosa
Chaenomeles Rubra grandiflora	=	Chaenomeles speciosa
Cydonia alba	=	Chaenomeles speciosa
Cydonia candidissima	=	Chaenomeles speciosa
Cydonia cardinalis	=	Chaenomeles speciosa
Cydonia falconnet	=	Chaenomeles speciosa
Cydonia moerloesii	=	Chaenomeles speciosa
Cydonia nivalis	=	Chaenomeles speciosa
Cydonia rosea	=	Chaenomeles speciosa
Cydonia rubra	=	Chaenomeles speciosa
Cydonia sanguinea	=	Chaenomeles speciosa
Cydonia wintercheer	=	Chaenomeles speciosa
Cydonia Xsimonii	=	Chaenomeles Xsuperba
Cupressus funebris	=	Chamaecyparis funebris
Cupressus sinensis pendula	=	Chamaecyparis funebris
Cupressus craigiana	=	Chamaecyparis lawsoniana
Cupressus lawsonia	=	Chamaecyparis lawsoniana
Thuja borealis	=	Chamaecyparis nootkatensis
Thujopsis borealis	=	Chamaecyparis nootkatensis
Retinospora crisppsi	=	Chamaecyparis obtusa
Retinospora ericoides	=	Chamaecyparis obtusa
Retinospora lycopodiodes	=	Chamaecyparis obtusa
Retinospora obtusa	=	Chamaecyparis obtusa
Retinospora argentia plumosa	=	Chamaecyparis pisifera
Retinospora filifera aurea	=	Chamaecyparis pisifera
Retinospora Leptoclada	=	Chamaecyparis pisifera
Retinospora pisifera	=	Chamaecyparis pisifera
Retinospora plumosa	=	Chamaecyparis pisifera
Retinospora squarrosa	=	Chamaecyparis pisifera
Chamaecyparis spaeroida	=	Chamaecyparis thyoides
Cupressus thyoides	=	Chamaecyparis thyoides
Cytisus proliferus	=	Chamaecytisus proliferus
Andromeda calyculata	=	Chamaedaphne calyculata
Chamaerops arborea	=	Chamaerops humilis
Chamaerops argentea	=	Chamaerops humilis
Chamaerops elegans	=	Chamaerops humilis
Chamaerops macrocarpa	=	Chamaerops humilis
Buddleia salicifolia	=	Chilianthus oleaceus
Calycanthus praecox	=	Chimonanthus praecox
Chimonanthus fragans	=	Chimonanthus praecox

Bambusa quadrangularis	=	Chimonbambussa quadrangularis
Arundinaria falcata	=	Chimonobambusa falcata
Bambusa falcata	=	Chimonobambusa falcata
Bambusa marmorea	=	Chimonobambusa marmorea
Chorizema splendens	=	Chorizema cordatum
Chorizema spectablis	=	Chorizema diversifolium
Chorizema chandleri	=	Chorizema varium
Chorizema elegans	=	Chorizema varium
Chorizema grandiflora	=	Chorizema varium
Chorizema macrophylla	=	Chorizema varium
Areca lutescens	=	Chrysalidocarpus lutescens
Camphora officinalis	=	Cinnamomum camphora
Lauras camphora	=	Cinnamomum camphora
Cinnamomum verum	=	Cinnamomum zeylandicum
Lauras ceylonica	=	Cinnamomum zeylanicum
Vitis antarctica	=	Cissus antarctica
Vitis hypoglauca	=	Cissus hypoglauca
Rhoicissus rhombifolium	=	Cissus rhombifolia
Cissus elen danica	=	Cissus rhombifolia
Amphelopsis sempervirens	=	Cissus striata
Cistus rosmarinifolius	=	Cistus clusii
Cistus sunset	=	Cistus crispus
Cistus tauricus	=	Cistus incanus
Cistus villosus	=	Cistus incanus
Cistus hirsutus	=	Cistus psilosepalus
Cistus ledon	=	Cistus Xglauca
Cistus brillancy	=	Cistus Xpurpureus
Cistus loreti	=	Cistus Xstenophylla
Citharexylum subserratum	=	Citharexylum fruticosum
ORANGE: MYRTLE LEAVED	=	Citrus aurantium
ORANGE: SEVILLE	=	Citrus aurantium
SHADDOCK	=	Citrus maxima
CITRON	=	Citrus medica
TANGIERINE	=	Citrus reticulata
MANDERIN	=	Citrus reticulata
ORANGE: BAHIA	=	Citrus sinensis
ORANGE: MALTA	=	Citrus sinensis
ORANGE: PARRAMATTA	=	Citrus sinensis
ORANGE: ST. MICHAELS	=	Citrus sinensis
Virgilia lutea	=	Cladrastis lutea
Cookia punctata	=	Clausena lansium
Clematis azurea	=	Clematis florida
Clematis belle of woking	=	Clematis florida
Clematis bicolor	=	Clematis florida
Clematis john gould veitch	=	Clematis florida
Clematis Lucie Lemoine	=	Clematis florida
Clematis sieboldtii	=	Clematis florida
Clematis davidiana	=	Clematis heracleifolia
Clematis tubulosa	=	Clematis heracleifolia
Clematis alba magna	=	Clematis lanuginosa
Clematis candidissima	=	Clematis lanuginosa
Clematis Lady Caroline Neville	=	Clematis lanuginosa
Clematis Lady Northcliffe	=	Clematis lanuginosa
Clematis madam van houtte	=	Clematis lanuginosa
Clematis Mrs Hope	=	Clematis lanuginosa
Clematis symeiana	=	Clematis lanuginosa
Clematis rubro violacea	=	Clematis lanuginosus
Clematis graveolens	=	Clematis orientalis
Clematis albert victor	=	Clematis patens
Clematis fair rosamond	=	Clematis patens
Clematis fortunii	=	Clematis patens
Clematis lasutern	=	Clematis patens
Clematis Miss Bateman	=	Clematis patens
Clematis Nelly Moser	=	Clematis patens
Clematis sir garnet wolseley	=	Clematis patens
Clematis sophia	=	Clematis patens

Clematis stella	=	Clematis patens
Clematis vesta	=	Clematis patens
Clematis erecta	=	Clematis recta
Clematis hendersonii	=	Clematis reticulata
Clematis coccinea	=	Clematis texensis
Clematis Countess d'Bouchard	=	Clematis Xjackmanii
Clematis Lady boville	=	Clematis Xjackmanii
Clematis Madam E. Andre	=	Clematis Xjackmanii
Clematis magnifica	=	Clematis Xjackmanii
Clematis prince of wales	=	Clematis Xjackmanii
Clematis rubella	=	Clematis Xjackmanii
Clematis star of india	=	Clematis Xjackmanii
Clematis thomas moore	=	Clematis Xjackmanii
Clematis ville de lyons	=	Clematis Xjackmanii
Clematis jeanne d' arc	=	Clematis Xlawsoniana
Clematis indivisa	=	clematis paniculata
Clerodendron foetidum	=	Clerodendron bungei
Clerodendron fragens	=	Clerodendron phillippinum
Clerodendron fallax	=	Clerodendron speciosissimum
Clerodendron balfouri	=	Clerodendron thomsoniae
Clerodendron fargesii	=	Clerodendron trichctomum
Bignonia lindleyana	=	Clytostoma callistegioides
Bignonia picta	=	Clytostoma callistegioides
Bignonia speciosa	=	Clytostoma callistegioides
Cochlospermum gossypium	=	Cochlospermum religiosum
Croton sp.	=	Codiaeum variegatum
Diosma alba	=	Coleonema alba
Coleonema rubrum	=	Coleonema pulchrum
Coleonema sunset gold	=	Coleonema pulchrum
Colletia bictonense	=	Colletia cruciata
Alocasia ilustris	=	Colocasia esculenta
Colutea cruenta	=	Colutea orientalis
Poivrea coccinea	=	Combretum coccineum
Comosperma cordifolia	=	Comesperma ericinum
Comospermum latifolia	=	Comesperma ericinum
Kennedeya splendens	=	Comptosema rubicundum
Coprosma microphylla	=	Coprosma quadrifida
Baueriana repens	=	Coprosma repens
Coprosma baureiana	=	Coprosma repens
Coprosma picturata	=	Coprosma repens
Coprosma variegata	=	Coprosma repens
Charlwoodia australis	=	Cordyline australis
Cordyline purpurea	=	Cordyline australis
Dracaena australis	=	Cordyline australis
Dracaena indivisa	=	Cordyline indivisa
Dracaena rubra	=	Cordyline rubra
Dracaena congesta	=	Cordyline stricta
Dracaena stricta	=	Cordyline stricta
Cordyline reginae	=	Cordyline terminalis
Dracaena amabilis	=	Cordyline terminalis
Dracaena baptisti	=	Cordyline terminalis
Dracaena cannaefolia	=	Cordyline terminalis
Dracaena chelsoni	=	Cordyline terminalis
Dracaena cooperi	=	Cordyline terminalis
Dracaena ferrea rosea	=	Cordyline terminalis
Dracaena fraseri	=	Cordyline terminalis
Dracaena guilfoyli	=	Cordyline terminalis
Dracaena imperialis	=	Cordyline terminalis
Dracaena magnifica	=	Cordyline terminalis
Dracaena metallica	=	Cordyline terminalis
Dracaena Robinsoniana	=	Cordyline terminalis
Dracaena Robusta	=	Cordyline terminalis
Dracaena terminalis	=	Cordyline terminalis
Dracaena youngea	=	Coreopsis gigantea
Leptosyne gigantea	=	Coriaria microphylla
Coriara thymifolia		

Cornus elegantissima	=	Cornus alba
Cornus sibirica variegata	=	Cornus alba
Cornus spaethi	=	Cornus alba
Benthamia fragifera	=	Cornus capitata
Cornus baileyi	=	Cornus sericea
Cornus stolonifera	=	Cornus sericea
Corynostylos albiflora	=	Cornyostylos hybanthus
Coronilla glauca	=	Coronilla valentina
Correa ferruginia	=	Correa lawrenciana
Correa speciosa	=	Correa reflexa
Correa virens	=	Correa reflexa
Correa viridis	=	Correa reflexa
Gynerium jubatum	=	Cortaderia jubata
Arundo conspicua	=	Cortaderia richardii
Cortaderia rosea	=	Cortaderia selloana
Gynerium argenteum	=	Cortaderia selloana
Gynerium argenteum plumosus	=	Cortaderia selloana
Gynerium argenteum roseum	=	Cortaderia selloana
Gynerium roseum	=	Cortaderia selloana
BARCEOLONA NUT	=	Corylus avellana
COBNUT	=	Corylus avellana
Corylus purpurea	=	Corylus avellana
COSFORD	=	Corylus avellana
FILBERT	=	Corylus avellana
HAZEL	=	Corylus avellana
GIANT FILBERT	=	Corylus maxima
Rhus cotinus	=	Cotinus coggygria
Rhus cotinoides	=	Cotinus obovatus
Cotoneaster baccillaris	=	Cotoneaster affinis
Cotoneaster macrophylla	=	Cotoneaster bullatus
Cotoneaster humifusa	=	Cotoneaster dammeri
Cotoneaster applanata	=	Cotoneaster dielsianus
Cotoneaster vicari	=	Cotoneaster frigidus
Cotoneaster parneyii	=	Cotoneaster lacteus
Cotoneaster thymifolia	=	Cotoneaster microphyllus
Cotoneaster amoena	=	Cotoneaster pannosus
Cotoneaster prostrata	=	Cotoneaster rotundifolius
Cotoneaster wheeleri	=	Cotoneaster rotundifolius
Cotyledon ovatum	=	Cotyledon orbiculata
Cotyledon arboreus	=	Crassula arborescens
Crassula portulacea	=	Crassula argentea
Rochea falcata	=	Crassula falcata
Crataegus pyrifolia	=	Crataegus calpodendron
Crataegus acutiloba	=	Crataegus cocccinoides
Crataegus alba flore pleno	=	Crataegus laevigata
Crataegus coccinea	=	Crataegus laevigata
Crataegus oxycantha	=	Crataegus laevigata
Crataegus puniceus	=	Crataegus laevigata
Crataegus Rosea superba	=	Crataegus laevigata
Crataegus stricta	=	Crataegus monogyna
Crataegus ellwagerni	=	Crataegus pedicellata
Crataegus acerifolia	=	Crataegus phaenopyrum
Crataegus corallina	=	Crataegus phaenopyrum
Crataegus cordata	=	Crataegus phaenopyrum
Craetugus korolkow	=	Crataegus pinnatifida
Crataegus smithiana	=	Crataegus uniflora
Crataegus carrieri	=	Crataegus Xlavallei
Crataegus splendens	=	Crataegus Xprunifolia
Crataegus odoratissima	=	Crateagus orientalis
Crataegus macrantha	=	Crateagus succulenta
Crotalaria arborescens	=	Crotalaria capensis
Crotalaria elegans	=	Crotalaria purpurea
Retinospora sewellii	=	Cryptomeria japonica
Cryptomeria araucariodes	=	Cryptomeria japonica
Cryptomeria elegans	=	Cryptomeria japonica
Cryptomeria lobbii	=	Cryptomeria japonica

Cryptomeria nana	=	Cryptomeria japonica
Cryptomeria plumosa	=	Cryptomeria japonica
Dryopteris deomposita	=	Ctenitis decomposita
Gymnogramma decomposta	=	Ctenitis decomposita
Cunninghamia sinensis	=	Cunninghamia lanceolata
Cuphea gallatiena	=	Cuphea cyanea
Cuphea strigulosa	=	Cuphea cyanea
Cuphea roezlli	=	Cuphea hookerana
Cuphea platycentia	=	Cuphea ignea
Cuphea tricolor	=	Cuphea jorullensis
Cuphea silenoides	=	Cuphea lanceolata
Cuphea zemapani	=	Cuphea lanceolata
Cuphea eminens	=	Cuphea micropetala
Cuphea minniata	=	Cuphea Xpurpurea
Cupressus scotti	=	Cupressus goveniana
Cupressus benthamiana	=	Cupressus lusitanica
Cupressus excelsa	=	Cupressus lusitanica
Cupressus glauca	=	Cupressus lusitanica
Cupressus knightii	=	Cupressus lusitanica
Cupressus lindleyana	=	Cupressus lusitanica
Cupressus pendula	=	Cupressus lusitanica
Cupressus uhdeana	=	Cupressus lusitanica
Cupressus brunniana	=	Cupressus macrocarpa
Cupressus lambertiana	=	Cupressus macrocarpa
Cupressus bedfordiana	=	Cupressus sempervirens
Cupressus expansa	=	Cupressus sempervirens
Cupressus horizontalis	=	Cupressus sempervirens
Cupressus pyramidalis	=	Cupressus sempervirens
Cupressus tourniforti	=	Cupressus sempervirens
Cupressus whitleyana	=	Cupressus sempervirens
Cupressus corneyana	=	Cupressus torulosa
Cupressus elegans	=	Cupressus torulosa
Cupressus gracilis	=	Cupressus torulosa
Cupressus majestica	=	Cupressus torulosa
Dicksonia excelsa	=	Cyathea excelsa
Pyrus cydonia	=	Cydonia oblonga
Cydonia vulgaris	=	Cydonia oblonga
Sida pulchella	=	Cynatrix pulchella
Cyperus variegatus	=	Cyperus alternifolius
Papyrus antiquorum	=	Cyperus papyrus
TREE TOMATO	=	Cyphomandra betacea
Spartium alba	=	Cytisus albus
Genista alba	=	Cytisus albus
Genista floribunda	=	Cytisus albus
Cytisus leucantus	=	Cytisus austriacus
Cytisus ramossimus	=	Cytisus canariensis
Genista canariensis	=	Cytisus canariensis
Genista floridus	=	Cytisus fragrans
Genista fragrans	=	Cytisus fragrans
Cytisus triflorus	=	Cytisus hirsutus
Spartium linifolium	=	Cytisus linifolius
Spartium multiflorum	=	Cytisus multiflorus
Cytisus elongata	=	Cytisus multiflorus
Laburnum nigricans	=	Cytisus nigricans
Genista racemosa	=	Cytisus racemosa
Spartium scoparium	=	Cytisus scoparius
Cytisus andreanus	=	Cytisus scoparus
Cytisus C.E. Pearson	=	Cytisus scoparus
Cytisus cornish cream	=	Cytisus scoparus
Cytisus daisy hill	=	Cytisus scoparus
Cytisus donard seedling	=	Cytisus scoparus
Cytisus firefly	=	Cytisus scoparus
Cytisus goldfinch	=	Cytisus scoparus
Cytisus lord lambourne	=	Cytisus scoparus
Genista andreana	=	Cytisus spachianus
Genista spachiana		

Daboecia polifolia	=	Daboecia cantabrica
Menziesia alba	=	Daboecia cantabrica
Menziesia polifolia	=	Daboecia cantabrica
Dampiera ovalifolia	=	Dampiera brownii
Dampiera rotundifolia	=	Dampiera brownii
Dampiera undulata	=	Dampiera brownii
Ruscus racemosus	=	Danae racemosa
Daphne fortuni	=	Daphne genkwa
Daphne indica odora	=	Daphne odora
Daphne purpurea	=	Daphne Xhoutteana
Daphne dauphine	=	Daphne Xhybrida
Darwinia miessneri	=	Darwinia lejostyla
Davallia elegans	=	Davallia denticulata
Davallia bullata	=	Davallia trichomanoides
Davallia dissecta	=	Davallia trichomanoides
Daviesia virgata	=	Daviesia corymbosa
Daviesia ruscifolia	=	Daviesia ulicifolia
Daviesia ulicina	=	Daviesia ulicifolia
Poinciana regia	=	Delonix regia
Bambusa gomatata	=	Dendrocalamus strictus
Bambusa pubescens	=	Dendrocalamus strictus
Dendropanax japonica	=	Dendropanax trifidus
Dicksonia davallioides	=	Dennstaedtia davallioides
Spiraea gracilis	=	Deutzia gracilis
Deutzia campanulata	=	Deutzia gracilis
Deutzia marmorata	=	Deutzia gracilis
Deutzia venusta	=	Deutzia rosea
Deutzia candidissima	=	Deutzia scabra
Deutzia corymbiflora	=	Deutzia scabra
Deutzia pride of rochester	=	Deutzia scabra
Deutzia sielboldiana	=	Deutzia scabra
Deutzia watereri	=	Deutzia scabra
Deutzia fortuni	=	Deutzia setchuenensis
Dracaena ensifolia	=	Dianella ensifolia
Adamia cyane	=	Dichroa febrifuga
Adamia versicolor	=	Dichroa febrifuga
Dennstadtia youngi	=	Dicksonia youngiae
Areca rubra	=	Dictyosperma album
Dieffenbachia barquinona	=	Dieffenbachia maculata
Dieffenbachia jenmannii	=	Dieffenbachia maculata
Dieffenbachia picta	=	Dieffenbachia maculata
Dieffenbachia bauserii	=	Dieffenbachia picta
Weigela splendens	=	Diervilla Xsplendens
Dillwynia cinerescens	=	Dillwynia juniperina
Dillwynia ericifolia	=	Dillwynia retorta
Dioscorea illustrata	=	Dioscorea discolor
Testuclunaria elephantipes	=	Dioscorea elephantipes
Diospyrus edulis	=	Diospyros kaki
Alantodea australis	=	Diplazium australe
Callipteris prolifera	=	Diplazium proliferum
Stadmannia australis	=	Diploglottis australis
Cupania australis	=	Diploglottis australis
Cupania cunninghami	=	Diploglottis cunninghamii
Felicia angustifolia	=	Diplopappus filifolius
Phaedranthus buccinatories	=	Distictis buccinatoria
Bignonia cherere	=	Distictis buccinatoria
Aralia elegans	=	Dizygotheca elegantissima
Aralia elegantissima	=	Dizygotheca elegantissima
Aralia veitechi	=	Dizygotheca veitchii
Dodonaea preissi	=	Dodonaea attenuata
Dodonaea hirtella	=	Dodonaea boroniifolia
Dodonaea salsolifolia	=	Dodonaea ericoides
Dodonaea truncata	=	Dodonaea trucatiales
Dodonaea burmaniana	=	Dodonaea viscosa
Dodonaea conferta	=	Dodonaea viscosa
Dodonaea pupurea	=	Dodonaea viscosa

Dolichos giganteus	=	Dolichos lablab
Dombeya mastersii	=	Dombeya burgessiae
Dombeya dregiana	=	Dombeya tiliacea
Dombeya natalensis	=	Dombeya tiliacea
Astrapea wallichii	=	Dombeya wallichii
Doodia blechnoides	=	Doodia maxima
Pteris gerandiafolia	=	Doryopteris concolor
Aberia caffra	=	Dovyalis caffra
Bignonia capreolata	=	Doxantha capreolata
Dracaena lindeni	=	Dracaena fragrans
Dracaena massangeana	=	Dracaena fragrans
Dracaena Queen Victoria	=	Dracaena fragrans
Dracaena gracilis	=	Dracaena marginata
Dracaena godseffiana	=	Dracaena surculosa
Lastrea cristata	=	Dryopteris cristata
Nephrodium decompositum	=	Dryopteris decomposita
Nephrodium glabrum	=	Dryopteris decomposita
Nephrodium molle	=	Dryopteris dentata
Nephrodium gracile	=	Dryopteris gracilis
Lastrea richardsii corymbosa	=	Dryopteris richardsii
Meniscium palustre	=	Dryopteris serrata
Meniscium serratum	=	Dryopteris serrata
Polypodium appendicalatuma	=	Dryopteris squamaestipes
Lastrea opaca	=	Dryopteris varia
Nephrodium velutina	=	Dryopteris velutina
Duranta alba	=	Duranta repens
Duranta aurea variegata	=	Duranta repens
Duranta ellisi	=	Duranta repens
Duranta inermis	=	Duranta repens
Duranta mexicana	=	Duranta repens
Duranta plumieri	=	Duranta repens
Duranta spinosa	=	Duranta repens
Adhatoda duvernoia	=	Duvernoia adhatodoides
Calampelis scabra	=	Eccremocarpus scabra
Cotyledon coccinea	=	Echeveria coccinea
Echeveria floribunda	=	Echeveria fulgens
Echeveria retusa	=	Echeveria fulgens
Cotyledon gibbiflora	=	Echeveria gibbiflora
Echeveria metallica	=	Echeveria gibbiflora
Cotyledon rosea	=	Echeveria rosea
Echeveria glauca major	=	Echeveria secunda
Echinocactus eyresii	=	Echinopsis eyriesii
Edgeworthia chrysantha	=	Edgeworthia papyrifera
Acrostichum appendiculatum	=	Egenofolia appendiculata
Elaeagnus argenteus	=	Elaeagnus commutata
Elaeagnus ferruginea	=	Elaeagnus latifolia
Elaeagnus edulis	=	Elaeagnus multiflora
Elaeagnus longipes	=	Elaeagnus multiflora
Elaeagnus aurea marginata	=	Elaeagnus pungens
Elaeagnus aurea variegata	=	Elaeagnus pungens
Elaeagnus variegatus	=	Elaeagnus pungens
Elaeagnus japonicus	=	Elaeagnus umbellata
Elaeis melanococca	=	Elaeis oleifera
Dicera dentata	=	Elaeocarpus dentatus
Elaeocarpus cyaneus	=	Elaeocarpus reticulatus
Aralea chabrierii	=	Elaeodendron orientale
Enkianthus perulatus	=	Enkianthus japonicus
Enkianthus japonicus	=	Enkianthus perulatus
Musa religiosa	=	Ensete gilletii
Musa superba	=	Ensete superbum
Musa arnoldiana	=	Ensete ventricosum
Musa ensete	=	Ensete ventricosum
Epacris campanulata	=	Epacris impressa
Epacris grandiflora	=	Epacris longifolia
Cactus latifrons	=	Epiphyllum oxypetalum
Phyllocactus phyllanthus	=	Epiphyllum phyllanthus

Pothos aurea	=	Epipremnum aureum
Raphidorphora aurea	=	Epipremnum aureum
Daedalacanthus nervosus	=	Eranthemum pulchellum
Bridgesia spicta	=	Ercilla spicta
Stenochilus glaber	=	Eremophila brownii
Stenochilus viscosus	=	Eremophila brownii
Stenochilus longifolius	=	Eremophila longifolia
Stenochilus maculatus	=	Eremophila maculata
Erica patersonia	=	Erica abietina
Erica stricta	=	Erica arborea
Erica bowieana	=	Erica bauera
Erica hentyana	=	Erica bauera
Erica pinkpearl	=	Erica carnea
Erica longifolia	=	Erica conspicua
Erica calycina	=	Erica coriifolia
Erica grandinosa	=	Erica formosa
Erica andromedaeflora	=	Erica holosericea
Erica codonodes	=	Erica lusitanica
Erica alopecoreides	=	Erica nudiflora
Erica winter gem	=	Erica oatesi
Erica pubescens	=	Erica parviflora
Erica sebana rubra	=	Erica petweri
Erica rollinsonia	=	Erica tricolor
Erica brownii	=	Erica ventricosa
Erica coccinea	=	Erica verticillata
Mespilus japonica	=	Eriobotrya japonica
Erioccephalus umbellatus	=	Eriocephalus africanus
Eriostemon nerifolium	=	Eriostemon myoporoides
Erythrina insignus	=	Erythrina caffra
Erythrina laurifolia	=	Erythrina christ-galli
Erythrina laurifolia	=	Erythrina crista-galli
Erythrina Madam Belanger	=	Erythrina crista-galli
Erythrina arborea	=	Erythrina herbacea
Erythrina picta	=	Erythrina parcellii
Erythrina lithosperma	=	Erythrina subumbrans
Erythrina india	=	Erythrina variegata
Erythrina indica	=	Erythrina variegata
Erythrina camdeni	=	Erythrina Xbidwillii
Escallonia floribunda	=	Escallonia bifida
Escallonia montevidiensis	=	Escallonia bifida
Escallonia organensis	=	Escallonia laevis
Escallonia C.F. Ball	=	Escallonia rubra
Escallonia ingramii	=	Escallonia rubra
Escallonia macrantha	=	Escallonia rubra
Escallonia sanguinea	=	Escallonia rubra
Escallonia william watson	=	Escallonia rubra
Escallonia gwendoline anley	=	Escallonia virgata
Escallonia phillipppiana	=	Escallonia virgata
Escallonia balfouri	=	Escallonia Xexoniensis
Escallonia Donard's deep pink	=	Escallonia Xlangleyensis
Escallonia edinburgh	=	Escallonia Xlangleyensis
Escallonia fretheyii	=	Escallonia Xrockii
Eucalyptus stuartiana	=	Eucalyptus bridgesiana
Eucalyptus rostrata	=	Eucalyptus camaldulensis
Eucalyptus cornocalyx	=	Eucalyptus cladocalyx
Eucalyptus gigantea	=	Eucalyptus delegatensis
Eucalyptus andreana	=	Eucalyptus elata
Eucalyptus numerosa	=	Eucalyptus elata
Eucalyptus siderophloia	=	Eucalyptus fibrosa
Eucalyptus elaeophora	=	Eucalyptus goniocalyx
Eucalyptus corymbosa	=	Eucalyptus gummifera
Eucalyptus angulosa	=	Eucalyptus incrassata
Eucalyptus costata	=	Eucalyptus incrassata
Eucalyptus bicolor	=	Eucalyptus largiflorens
Eucalyptus hemipholia	=	Eucalyptus moluccana
Eucalyptus cordieri	=	Eucalyptus nortonii

Eucalyptus fissilis	=	Eucalyptus obliqua
Eucalyptus coriacea	=	Eucalyptus pauciflora
Eucalyptus phlebopyhlla	=	Eucalyptus pauciflora
Metrosideros aromatica	=	Eucalyptus piperita
Eucalyptus micantha	=	Eucalyptus racemosa
Eucalyptus eugenoides	=	Eucalyptus scabra
Eucalyptus transcontinental	=	Eucalyptus socialis
Eucryphia pinnatifolia	=	Eucryphia glutinosa
Eugenia buxifolia	=	Eugenia foetida
Eugenia myrtifolia	=	Eugenia paniculatum
Eugenia oleosa	=	Eugenia paniculatum
Eugenia mitchelli	=	Eugenia uniflora
Euonymus alba	=	Euonymus europaea
Euonymus media	=	Euonymus europaeus
Euonymus gracilis	=	Euonymus fortunei
Euonymus radicans	=	Euonymus fortunei
Euonymus yedoensis	=	Euonymus hamiltoniana
Euonymus aurea marginata	=	Euonymus japonicum
Euonymus Duc d' Anjou	=	Euonymus japonicus
Euonymus macrophyllus	=	Euonymus japonicus
Euonymus microphyllus	=	Euonymus japonicus
Euonymus ovatus	=	Euonymus japonicus
Euonymus variegatus	=	Euonymus japonicus
Euonymus albus latifolius	=	Euonymus latifolia
Conoclinium coelestinum	=	Eupatorium coelestinum
Eupatorium weinmannianum	=	Eupatorium ligustrinum
Hebeclinium megaphyllum	=	Eupatorium megalophyllum
Conoclinium ianthemum	=	Eupatorium sordidum
Eupatorium ianthinum	=	Eupatorium sordidum
Hebeclinlum ianthinum	=	Eupatorium sordidum
Euphorbia jacquiniflora	=	Euphorbia fulgens
Euphorbia bojerii	=	Euphorbia milii
Poinsettia albida	=	Euphorbia pulcherrima
Poinsettia pulcherrima	=	Euphorbia pulcherrima
Eurya latifolia	=	Eurya japonica
Othonna athanaisiae	=	Euryops athanasiae
Euscaphis staphyleoides	=	Euscaphis japonica
Eustrephus augustifolius	=	Eustrephus latifolius
Eutaxia diffusa	=	Eutaxia empetrifolia
Eutaxia microphylla	=	Eutaxia empetrifolia
Eulterpe edule	=	Euterpe edulis
Exochorda alberti	=	Exochorda korolkowii
Exochorda grandiflora	=	Exochorda racemosa
Glycine bituminosa	=	Fagelia bituminosa
Fagus asplenifolia	=	Fagus sylvatica
Fagus zlatia	=	Fagus sylvatica
Aralia japonica	=	Fatsia japonica
Aralia sieboldii	=	Fatsia japonica
Feijoa Xcoolidgii	=	Feijoa sellowiana
Agathea colestris	=	Felicia amelloides
Aster fruticulosus	=	Felicia fruticosa
Diplopappus fruticans	=	Felicia fruticosa
Ficus parcelli	=	Ficus aspera
Ficus indica	=	Ficus bengalensis
Ficus longifolia	=	Ficus bengalensis
BANYAN	=	Ficus benghalensis
Ficus lucida	=	Ficus benjamina
Ficus nitida	=	Ficus benjamina
Ficus pendula	=	Ficus benjamina
Ficus decora	=	Ficus elastica
Ficus doescheri	=	Ficus elastica
Ficus macrocarpa	=	Ficus macrophylla
Ficus minima	=	Ficus pumila
Ficus repens	=	Ficus pumila
Ficus stipulata	=	Ficus pumila
Ficus vesca	=	Ficus racemosa

Ficus banyan	=	Ficus religiosa
Ficus australis	=	Ficus rubiginosa
Ficus radicans	=	Ficus sagittata
Ficus cunninghamii	=	Ficus virens
Spiraea gigantea	=	Filipendula camtschatica
Sterculea platanifolia	=	Firmiana simplex
Fitzroya patagonica	=	Fitzroya cupressoides
Flacourtia cataphracta	=	Flacourtia jangomas
Forsythia spectablis	=	Forsythia intermedia
Forsythia fortunei	=	Forsythia suspensa
Forsythia variegata aurea	=	Forsythia suspensa
Forsythia Lynwood gold	=	Forsythia Xintermedia
Forsythia Spring glory	=	Forsythia Xintermedia
Citrus japonica	=	Fortunella japonica
CUMQUAT	=	Fortunella japonica
Fraxinus alba	=	Fraxinus americana
Fraxinus lentiscifolia	=	Fraxinus angustifolia
Fraxinus aurea	=	Fraxinus excelsior
Fraxinus sambucifolia	=	Fraxinus nigra
Ornus europaeus	=	Fraxinus ornus
Fraxinus lanceolata	=	Fraxinus pennsylvanica
Fraxinus pubescens	=	Fraxinus pennsylvanica
Fremontia californica	=	Fremontodendron californicum
Fuchsia seratifolia	=	Fuchsia denticulata
Fuchsia spectabilis	=	Fuchsia macrostigma
Fuchsia gracilis	=	Fuchsia magellanica
Fuchsia conica	=	Fuchsia magellanica
Fuchsia globosa	=	Fuchsia magellanica
Fuchsia kirkii	=	Fuchsia procumbens
Fuchsia coralle	=	Fuchsia Xexoniensis
Fuchsia corallina	=	Fuchsia Xexoniensis
Fourcraea beddinghausei	=	Furcraea bedinghausii
Fourcroya gigantea	=	Furcraea foetida
Fourcraea lindeni	=	Furcraea selloa
Gardendia grandiflora	=	Gardenia jasminoides
Gardenia augusta	=	Gardenia jasminoides
Gardenia florida	=	Gardenia jasminoides
Gardenia fortuniana	=	Gardenia jasminoides
Gardenia intermedia	=	Gardenia jasminoides
Gardenia magnifica	=	Gardenia jasminoides
Gardenia major pleno	=	Gardenia jasminoides
Gardenia profardenia	=	Gardenia jasminoides
Gardenia radicans	=	Gardenia jasminoides
Andromeda rupestrus	=	Gaultheria antipoda
Eriostemon lineariifolium	=	Geijera parviflora
Cytisus monspessulanus	=	Genista monspessulana
Genista delphinesis	=	Genista sagittalis
Genista frutescens	=	Genista tinctoria
Genista lasicarpa	=	Genista tinctoria
Salisburia adiantifolia	=	Ginkgo biloba
Gleditsia horrida	=	Gleditsia sinensis
Gleichenia spelonae	=	Gleichenia circinnata
Taxus nucifera	=	Glyptostrobus lineatus
Gmelina parviflora	=	Gmelina asiatica
Gnidia simplex	=	Gnidia polystachya
Gordonia anomala	=	Gordonia axillaris
Earlia excelsa	=	Graptophyllum excelsum
Justica caryana	=	Graptophyllum pictum
Justica picta	=	Graptophyllum pictum
Grevillea dallachiana	=	Grevillea alpina
Grevillea forsterii	=	Grevillea banksii
Grevillea blechnum	=	Grevillea caleyi
Grevillea coccinea	=	Grevillea concinna
Grevillea latroberi	=	Grevillea ericifolia
Grevillea desert flame	=	Grevillea glabella
Grevillea rankinsii	=	Grevillea glabella

Grevillea linearis	=	Grevillea linearifolia
Grevillea golden sparkle	=	Grevillea punicea
Gymnocladus canadensis	=	Gymnocladus dioica
Hakea brachyrrhyncha	=	Hakea acicularis
Hakea eucalyptiodes	=	Hakea laurina
Hakea teretifolia	=	Hakea pugioniformis
Hakea tenuifolia	=	Hakea sericea
Cistus formosus	=	Halimium lasianthum
Cistus algarvensis	=	Halimium ocymoides
Hamamamelus rubra	=	Hamamelis vernalis
Hardenbergia digitata	=	Hardenbergia comptoniana
Hardenbergia lindelyana	=	Hardenbergia comptoniana
Kennedaya coerulea	=	Hardenbergia comptoniana
Kennedaya digitata	=	Hardenbergia comptoniana
Kennedeya comptoniana	=	Hardenbergia comptoniana
Hardenbergia alba	=	Hardenbergia violacea
Hardenbergia monophylla	=	Hardenbergia violacea
Hardenbergia ovata	=	Hardenbergia violacea
Hardenbergia rosea	=	Hardenbergia violacea
Kennedaya alba	=	Hardenbergia violacea
Kennedeya ovata alba	=	Hardenbergia violacea
Cereus bonplaudii	=	Harrisia bonplandii
Cereus platygonus	=	Harrisia platygona
Cereus tortuosus	=	Harrisia tortuosa
Aloe attenta	=	Haworthia attenuata
Aloe margartitia	=	Haworthia margaritifera
Hebe decussata	=	Hebe elliptica
Veronica autumn glory	=	Hebe elliptica
Veronica decussata	=	Hebe elliptica
Veronica variblis	=	Hebe hectorii
Veronica hartiana	=	Hebe insularis
Veronica angustifolia	=	Hebe parviflora
Veronica lindleyana	=	Hebe salicifolia
Hebe imperialis	=	Hebe speciosa
Veronica hendersonii	=	Hebe speciosa
Veronica imperialis	=	Hebe speciosa
Veronica kermesina	=	Hebe speciosa
Veronica speciosa	=	Hebe speciosa
Veronica lobeliaeoides	=	Hebe Xblue gem
Hedera algeriensis	=	Hedera canariensis
Hedera maderensis	=	Hedera canariensis
Hedera amurensis	=	Hedera colchica
Hedera dentata	=	Hedera colchica
Hedera caenwoodiana	=	Heder helix
Hedera cavandishii	=	Hedera helix
Hedera cristata	=	Hedera helix
Hedera latifolia	=	Hedera helix
Hedera maculata	=	Hedera helix
Hedera marmorata	=	Hedera helix
Hedera palmata	=	Hedera helix
Hedera raegneriana	=	Hedera helix
Hedera rubra argentea	=	Hedera helix
Hedera sagittifolia	=	Hedera helix
Hedera spectabilis	=	Hedera helix
Hedera tricolor	=	Hedera helix
Hedera triloba	=	Hedera helix
Hedera japonica	=	Hedera rhombea
Bouvardia Humboldti corymbiflora	=	Hedyotis purpurea
Bouvardia longifolia	=	Hedyotis purpurea
Kentia Canterburyana	=	Hedyscepe canterburyana
Cereus mallansonii	=	Heliaporus smithii
Ozanthamnus diosmaefolius	=	Helichrysum diosmifolium
Cactus speciosimus	=	Heliocereus speciosus
Cereus speciosissmus	=	Heliocereus speciosus
Epiphyllum speciosum	=	Heliocereus speciosus
Heliotropium aureum	=	Heliotropium arborescens

Heliotropium peruvianum	=	Heliotropium arborescens
Heliotropium white lady	=	Heliotropium arborescens
Heliotropium lord roberts	=	Heliotropium Xvoltaireanum
Heeria elegans	=	Heterocentron elegans
Heeria rosea	=	Heterocentron macrostachyum
Heterocentron album	=	Heterocentron roseum
Crataegus arbutifolia	=	Heteromeles arbutifolia
Photina arbutifolia	=	Heteromeles arbutifolia
Heuchera splendens	=	Heuchera sanguinea
Hibbertia billarderi	=	Hibbertia aspera
Candollea cuneiformis	=	Hibbertia cuneiformis
Hibbertia prostrata	=	Hibbertia fasciculata
Hibbertia volubilis	=	Hibbertia scandens
Pleuranda ericaefolia	=	Hibbertia stricta
Hibiscus chrysanthus	=	Hibiscus calyphyllus
Hibiscus grandiflorus	=	Hibiscus heterophyllus (pre-
Hibiscus grossulariaefolius	=	Hibiscus huegeli
Hibiscus californica	=	Hibiscus lasiocarpus
Hibiscus californicus	=	Hibiscus lasiocarpus
Hibiscus palustris	=	Hibiscus moscheutos
Hibiscus lindeyanus	=	Hibiscus radiatus
Hibiscus agnes galt	=	Hibiscus rosa-sinensis
Hibiscus apple blossum	=	Hibiscus rosa-sinensis
Hibiscus conquerer	=	Hibiscus rosa-sinensis
Hibiscus cooperi	=	Hibiscus rosa-sinensis
Hibiscus general courteges	=	Hibiscus rosa-sinensis
Hibiscus island emperess	=	Hibiscus rosa-sinensis
Hibiscus lamberti	=	Hibiscus rosa-sinensis
Hibiscus lilieflorus	=	Hibiscus rosa-sinensis
Hibiscus lutea	=	Hibiscus rosa-sinensis
Hibiscus wilders white	=	Hibiscus rosa-sinensis
Hibiscus bicolor	=	Hibiscus syriacus
Hibiscus coelestris	=	Hibiscus syriacus
Litobrochia incisa	=	Histiopteris incisa
Pteris vespertilions	=	Histiopteris incisa
Plagianthus lyalli	=	Hoheria lyallii
Hoheria osbornei	=	Hoheria populnea
Hastingia coccinea	=	Holmskioldia sanguinea
Spiraea arioefolia	=	Holodiscus discolor
Cocloba platyclada	=	Homalocladium platycladum
Muehlenbeckia platycada	=	Homalocladium platycladum
Hovea elliptica	=	Hovea celsii
Hovea lanceolata	=	Hovea longifolia
Hovea purpurea	=	Hovea longifolia
Kentia belmoreana	=	Howea belmoreana
Howea kenta	=	Howea forsterana
Kentia forsterana	=	Howea forsterana
Hoya carnea	=	Hoya carnosa
Hoya exotica	=	Hoya carnosa
Hoya ovata	=	Hoya carnosa
Hoya picta	=	Hoya carnosa
Hoya variegata	=	Hoya carnosa
Cyrtoceras multiflora	=	Hoya multiflora
Cyrtoceras reflexum	=	Hoya multiflora
Hoya trinerva	=	Hoya pottsii
Hydrangea petiolaris	=	Hydrangea anomala
Hydrangea scandens	=	Hydrangea anomala
Hydrangea villosa	=	Hydrangea aspera
Hydrangea ataxa	=	Hydrangea macrophylla
Hydrangea cyanoclada	=	Hydrangea macrophylla
Hydrangea fimbriata	=	Hydrangea macrophylla
Hydrangea hortensis	=	Hydrangea macrophylla
Hydrangea japonica	=	Hydrangea macrophylla
Hydrangea nigra	=	Hydrangea macrophylla
Hydrangea otaska	=	Hydrangea macrophylla
Hydrangea rosea marginata	=	Hydrangea macrophylla

Hydrangea stellata	=	Hydrangea macrophylla
Hydrangea Thomas hogg	=	Hydrangea macrophylla
Cereus napoleneus	=	Hylocereus napolensis
Cactus triangularis	=	Hylocereus triangularis
Cereus triangularis	=	Hylocereus triangularis
Hymenantha banksii	=	Hymenanthera dentata
Hypericum floribundum	=	Hypericum canariense
Webbia canariensis	=	Hypericum canariense
Hypericum monogynum	=	Hypericum chinense
Hypericum rowallane	=	Hypericum hookerianum
Hypericum oblonga	=	Hypericum oblongifolium
Hypericum tricolor	=	Hypericum Xmoseranum
Ilex angustifolia	=	Ilex aquifolium
Ilex argentea	=	Ilex aquifolium
Ilex balearica	=	Ilex aquifolium
Ilex ferox	=	Ilex aquifolium
Ilex heterophylla	=	Ilex aquifolium
Ilex nobilis	=	Ilex aquifolium
Ilex sempervirens	=	Ilex aquifolium
Ilex sheppardi	=	Ilex aquifolium
Ilex waterei	=	Ilex aquifolium
Ilex myrtifolia	=	Ilex cassine
Ilex reevsiana	=	Ilex crenata
Ilex crassine	=	Ilex opaca
Ilex rotundifolia	=	Ilex opaca
Ilex platyphylla	=	Ilex perado
Ilex sieboldii	=	Ilex serrata
Prinos verticillata	=	Ilex verticillata
Ilex donningtoniensis	=	Ilex Xaltaclarensis
Ilex laurifolia	=	Ilex Xaltaclarensis
Illicium religiosum	=	Illicium anisatum
Indigofera sylvatica	=	Indigofera australis
Indigofera dousa	=	Indigofera gerardiana
Indigofera decora	=	Indigofera incarnata
Indigofera violacea	=	Indigofera pulchella
Calliandra tweedii	=	Inga pulcherrima
Habrothamus cyaneus	=	Iochroma cyaneum
Iochroma tubutosa	=	Iochroma cyaneum
Ipomoea bona nex	=	Ipomoea acuminata
Ipomoea learii	=	Ipomoea acuminata
Ipomoea ficifolia	=	Ipomoea bonariensis
Ipomoea pendula	=	Ipomoea palmata
Petrophylla anethifolia	=	Isopogon anemonifolius
Isopogon dubus	=	Isopogon roseus
Ixora alba	=	Ixora chinensis
Ixora coleei	=	Ixora chinensis
Ixora cracata	=	Ixora chinensis
Ixora Dixiana	=	Ixora chinensis
Ixora grandiflora	=	Ixora chinensis
Ixora prince of orange	=	Ixora chinensis
Ixora rosea	=	Ixora chinensis
Ixora stricta	=	Ixora chinensis
Ixora bandhuca	=	Ixora coccinea
Ixora incarnata	=	Ixora coccinea
Ixora moresi	=	Ixora coccinea
Ixora macrophylla	=	Ixora fulgens
Ixora arborea	=	Ixora parviflora
Cyrtanthera magnifica	=	Jacobinia carnea
Justica salicina	=	Jacobinia sericea
Justica splendens	=	Jacobinia sericea
Eugenia macleayensis	=	Jambosa purpurea
Jessamine white	=	Jasmine officinale
Jasminum subulatum	=	Jasminum floridum
Jasminum chrysanthemum	=	Jasminum humile
Jasminum reevesii	=	Jasminum humile
Jasminum revolutum	=	Jasminum humile

Jasminum ligustrifolium	=	Jasminum leratii
Jasminum bidwilli	=	Jasminum lineare
Jasminum primulinum	=	Jasminum mesnyi
Jasminum pubescens	=	Jasminum multiflorum
Jasminum Maid of Orleans	=	Jasminum sambac
Jasminum heterophyllum	=	Jasminum subhumile
Jasminum gracile	=	Jasminum volubile
Calceolaria violacea	=	Jovellana violacea
Juanulloa parasitica	=	Juanulloa aurantiaca
Jubaea spectabilis	=	Jubaea chilensis
Juglans cordiformis	=	Juglans ailantifolia
Juglans sieboldtii	=	Juglans ailantifolia
WALNUT(PRE-1890)	=	Juglans regia
Viminaria denuda	=	Juncea juncea
Juniperus aurea variegata	=	Juniperus chinensis
Juniperus blaaw	=	Juniperus chinensis
Juniperus fortunei	=	Juniperus chinensis
Juniperus japonica	=	Juniperus chinensis
Juniperus keteleeri	=	Juniperus chinensis
Juniperus procumbens	=	Juniperus chinensis
Juniperus sinensis	=	Juniperus chinensis
Juniperus sphaerica	=	Juniperus chinensis
Juniperus compressa	=	Juniperus communis
Juniperus cracovia	=	Juniperus communis
Juniperus erecta	=	Juniperus communis
Juniperus hibernica	=	Juniperus communis
Juniperus phenicea	=	Juniperus excelsa
Juniperus Stricta	=	Juniperus excelsa
Juniperus prostrata	=	Juniperus horizontalis
Juniperus pfitzeriana	=	Juniperus media
Juniperus attica	=	Juniperus oxycedrus
Juniperus macracarpa	=	Juniperus oxycedrus
Juniperus rufescens	=	Juniperus oxycedrus
Juniperus langoldiana	=	Juniperus phoenicea
Juniperus tamariscifolia	=	Juniperus sabina
Juniperus argentia	=	Juniperus virginiana
Juniperus africanus	=	Juniperusprocera
Justica rosea	=	Justica carnea
Adhatoda cydonaefolia	=	Justica cydonaefolia
Libonia floribunda	=	Justica rizzinii
Libonia penrhosiensis	=	Justica rizzinii
Adhatoda vassica	=	Justicia adhatoda
Beloperone guttata	=	Justicia brandegeana
Aphelandra Gheisbrechtii	=	Justicia ghiesbreghtiana
Sericographis ghiesbreghtiana	=	Justicia spicigera
Kalanchoe somaliensis	=	Kalanchoe marmorata
Zichya molle	=	Kennedia coccinea
Metrosideros capitata	=	Kunzea capitata
Cytisus alpinus	=	Laburnum alpinum
Cytisus vulgare	=	Laburnum anagryoides
Cytisus laburnum	=	Laburnum anagyroides
Laburnum vulgare	=	Laburnum anagyroides
Laburnum Xvossi	=	Laburnum Xwatereri
Lagerstroemia alba	=	Lagerstroemia indica
Lagerstroemia eavesii	=	Lagerstroemia indica
Lagerstroemia elegans	=	Lagerstroemia indica
Lagerstroemia heliotrope beauty	=	Lagerstroemia indica
Lagerstroemia mathewsi	=	Lagerstroemia indica
Lagerstroemia newmanii	=	Lagerstroemia indica
Lagerstroemia ovalifolia	=	Lagerstroemia indica
Lagerstroemia reginae	=	Lagerstroemia indica
Lagerstroemia rosea	=	Lagerstroemia indica
Lagerstroemia rubra	=	Lagerstroemia speciosa
Lagerstroemia flos-reginae	=	Lagunaria patersonii
Fugosia patersonii	=	Lagunaria patersonii
Hibiscus patersonii		

Lantana alba	=	Lantana camara
Lantana chelsea gem	=	Lantana camara
Lantana diadem	=	Lantana camara
Lantana flora	=	Lantana camara
Lantana goliath	=	Lantana camara
Lantana mutablis	=	Lantana camara
Lantana sanguinea	=	Lantana camara
Lantana grandiflora	=	Lantana crocea
Lantana delicata	=	Lantana montevidensis
Lantana sellowii	=	Lantana montevidensis
Lapageria alba	=	Lapageria rosea
Larix europea	=	Larix decidua
Pinus larix	=	Larix decidua
Larix leptolepsis	=	Larix kaempferi
Latania Borbonica	=	Latania lontaroides
Latania commersonii	=	Latania lontaroides
Latania rubra	=	Latania lontaroides
Lauras regalis	=	Lauras nobilis
Lavandula spicta	=	Lavandula angustifolia
Lavandula arbrotanoides	=	Lavandula multifida
Phlomis leonorus	=	Leonotis leonurus
Hemitelia moorei	=	Lepidorrhachis mooreana
Kentia mooreana	=	Lepidorrhachis mooreana
Macrozamia denisonii	=	Lepidozamia peroffskyana
Davallia nove zealandiae	=	Leptolepia novae-zealandiae
Todea fraseri	=	Leptopteris fraseri
Todea superba	=	Leptopteris superba
Todea intermedia	=	Leptopteris Xintermedia
Leptospermum keatleyii	=	Leptosermum scoparium
Leptospermum buxifolium	=	Leptospermum flavescens
Leptospermum grandifolium	=	Leptospermum flavescens
Leptospermum tuberculatum	=	Leptospermum flavescens
Fabricia laevigata	=	Leptospermum laevigatum
Leptospermum pubescens	=	Leptospermum lanigerum
Leptospermum citratum	=	Leptospermum petersonii
Leptospermum alba plena	=	Leptospermum scoparium
Leptospermum arachnoidem	=	Leptospermum scoparium
Leptospermum chapmanii	=	Leptospermum scoparium
Leptospermum lambethii	=	Leptospermum scoparium
Leptospermum multiflorum	=	Leptospermum scoparium
Leptospermum nicholsii	=	Leptospermum scoparium
Leptospermum red damsk	=	Leptospermum scoparium
Leptospermum sandersii	=	Leptospermum scoparium
Leptospermum Xwalkerii	=	Leptospermum scoparium
Leptospermum persiciflorum	=	Leptospermum squarrosum
Desmodium penduliflorum	=	Lespedeza thunbergii
Protea saligna	=	Leucadendron salignum
Acacia glauca	=	Leucaena glauca
Leucopogon australis	=	Leucopogon lanceolatus
Leucopogon adpressus	=	Leucopogon muticus
Leucopogon richei	=	Leucopogon parviflorus
Leucospermum conocarpum	=	Leucospermum concarpodendron
Davallia mooreana	=	Leucostegia pallida
Andromeda axillaris	=	Leucothoe axillaris
Andromeda catesbaei	=	Leucothoe fontanesiana
Leycesteria variegata	=	Leycesteria formosa
Thuja gigantea	=	Libocedrus decurrens
Thuja doniana	=	Libocedrus doniana
Libocedrus doniana	=	Libocedrus plumosa
Ligustrum ionandrum	=	Ligustrum delavayanum
Ligustrum spicatum	=	Ligustrum indicum
Ligustrum coriaceum	=	Ligustrum japonicum
Ligustrum ovatum	=	Ligustrum japonicum
Ligustrum tricolor	=	Ligustrum lucidum
Ligustrum aureum elegantissimum	=	Ligustrum ovalifolium
Ligustrum californicum	=	Ligustrum ovalifolium

Ligustrum golden variegatum	=	Ligustrum ovalifolium
Ligustrum ibota	=	Ligustrum ovalifolium
Ligustrum folis argenteis pictis	=	Ligustrum sinense
Ligustrum pubescens	=	Ligustrum sinense
Ligustrum ciliatum	=	Ligustrum tschonskii
Ligustrum lodense	=	Ligustrum vulgare
Ligustrum variegatum	=	Ligustrum vulgare
Statice	=	Limonium
Statice arborea	=	Limonium arborescens
Statice brassicafolia	=	Limonium brassicifolium
Statice dicksonii	=	Limonium roseum
Areca monostachya	=	Linospadix monostachya
Liquidambar festerii	=	Liquidambar styraciflua
Dimocarpus litchi	=	Litchi chinensis
Quercus glabra	=	Lithocarpus glaber
Lithospermum prostratum	=	Lithodora diffusa
Corypha australis	=	Livistona australis
Latania woodfordi	=	Livistona woodfordii
Livistonia mauritiana	=	Livistonia chinensis
Livistonia olivaeformis	=	Livistonia chinensis
Livistonia inermis	=	Livistonia humilis
Siphocamphylos bicolor	=	Lobelia laxiflora
Lomatia longifolia	=	Lomatia myricoides
Caprifolium perfoliatum	=	Lonicera caprifolium
Lonicera gigantea	=	Lonicera etrusca
Lonicera balearica	=	Lonicera implexa
Lonicera aurea-reticulata	=	Lonicera japonica
Lonicera brachypoda	=	Lonicera japonica
Lonicera confusa	=	Lonicera japonica
Lonicera flexuosa	=	Lonicera japonica
Lonicera halliana	=	Lonicera japonica
Lonicera multiflora	=	Lonicera japonica
Lonicera sinense	=	Lonicera japonica
Chamocerasus morrowii	=	Lonicera morrowii
Lonicera coccinea	=	Lonicera sempervirens
Lonicera alberti	=	Lonicera spinosa
Lonicera grandiflora rosea	=	Lonicera tatarica
Lonicera pulcherrima	=	Lonicera tatarica
Lonicera rubrum	=	Lonicera tatarica
Lonicera punicea	=	Lonicera Xbrownii
Myrtus bullata	=	Lophomyrtus bullata
Myrtus obcordatus	=	Lophomyrtus obcordata
Myrtus ralphii purpurea	=	Lophomyrtus XRalphii
Lotus pelyorhinchus	=	Lotus berthelotii
Luculia tsetensis	=	Luculia grandifolia
Eugenia apiculata	=	Luma apiculata
Lycium rigidum	=	Lycium chinense
Lygodium dichotoma	=	Lygodium circinatum
Lygodium venustum	=	Lygodium polymorphum
Lygodium forsteri	=	Lygodium reticulatum
Lygodictylon scandens	=	Lygodium scandens
Andromeda paniculata	=	Lyonia ligustrina
Andromeda mariana	=	Lyonia mariana
Acacia latisiliqua	=	Lysiloma latisiliqua
Macadamia ternifolia	=	Macadamia integrifolia
Helicia ternifolia	=	Macadamia ternifolia
Helicia tetraphylla	=	Macadamia tetraphylla
Bignonia gracilis	=	Macfadyena unguis-cati
Bignonia Tweediana	=	Macfadyena unguis-cati
Doxantha unguis cati	=	Macfadyena unguiscati
Bocconia japonica	=	Macleaya cordata
Bocconia microcarpa	=	Macleaya microcarpa
Maclura aurantiaca	=	Maclura pomifera
Zambia spiralis	=	Macrozamia communis
Encephalartos mcquillii	=	Macrozamia miquelii
Macrozamia plumosa	=	Macrozamia Pauli-Guilielmi

Macrozamia corallipes gyrata	=	Macrozamia spiralis
Macrozamia cylindrica	=	Macrozamia spiralis
Macrozamia mackenziesii	=	Macrozamia spiralis
Zambia mackenzieii	=	Macrozamia spiralis
Magnolia cordata	=	Magnolia acuminata
Magnolia mollicomata	=	Magnolia campbellii
Magnolia pumila	=	Magnolia co'co
Magnolia lanceolata	=	Magnolia grandiflora
Magnolia conspicua	=	Magnolia heptapeta
Magnolia denudata	=	Magnolia heptapeta
Magnolia yulan	=	Magnolia heptapeta
Magnolia obovata	=	Magnolia hypoleuca
Magnolia discolor	=	Magnolia quinquepeta
Magnolia gracilis	=	Magnolia quinquepeta
Magnolia liliflora	=	Magnolia quinquepeta
Magnolia purperea	=	Magnolia quinquepeta
Magnolia parviflora	=	Magnolia sieboldii
Magnolia umbrella	=	Magnolia tripetala
Magnolia glauca	=	Magnolia virginiana
Magnolia alexandriana	=	Magnolia Xsoulangiana
Magnolia amabilis	=	Magnolia Xsoulangiana
Magnolia lennei	=	Magnolia Xsoulangiana
Berberis aquifolia	=	Mahonia aquifolium
Mahonia fascicularis	=	Mahonia aquifolium
Berberis bealei	=	Mahonia bealei
Ilex japonica	=	Mahonia bealei
Berberis fortunei	=	Mahonia fortunei
Berberis japonica	=	Mahonia japonica
Berberis leschenaultii	=	Mahonia napaulensis
Berberis fascicularis	=	Mahonia pinnata
Berberis repens	=	Mahonia repens
Pyrus baccata	=	Malus baccata
Malus parkmani	=	Malus halliana
Malus theifera	=	Malus hupehensis
Malus dartmouth	=	Malus pumila
Malus niedzwetzkyana	=	Malus pumila
Malus leucadendron	=	Malus quinquenervia
Malus riversi	=	Malus spectabilis
Pyrus spectabilis	=	Malus spectabilis
Malus aldenhamensis	=	Malus Xpurpurea
Malus eleyi	=	Malus Xpurpurea
Malus lemonei	=	Malus Xpurpurea
Malus hillieri	=	Malus Xscheideckeri
Pavonia coccinea	=	Malvaviscus arboreus
Diplandenia boliviensis	=	Mandevilla boliviensis
Mandevilla suavolens	=	Mandevilla laxa
Diplandenia Xamabilis	=	Mandevilla Xamabilis
Manettia glabra	=	Manettia cordifolia
Manettia bicolor	=	Manettia inflata
Achras sapato	=	Manilkara zapota
Marattia elegans	=	Marattia salicifolia
Medinilla amabilis	=	Medinilla teysmannii
Melaleuca oriaia	=	Melaleuca brevifolia
Melaleuca genistifolia	=	Melaleuca decora
Melaleuca adnata	=	Melaleuca eleuterostachya
Metrosideros decora	=	Melaleuca genistifolia
Melaleuca pustulata	=	Melaleuca halmaturorum
Melaleuca crassifolia	=	Melaleuca laxifolia
Melaleuca parvifolia	=	Melaleuca laxifolia
Metrosideros coriacea	=	Melaleuca quinquenervia
Lasiandra rosea	=	Melastoma malabrathricum
Melia australis	=	Melia azedarach
Melia semperfloren	=	Melia azedarach
Ipomoea tuberosa	=	Merremia tuberosa
Botryodendron reticulatum	=	Meryta denhamii
Botryodendron latifolium	=	Meryta latifolia

Metrosideros tomentosa	=	Metrosideros excelsus
Metrosideros villosa	=	Metrosideros kermadecensis
Metrosideros lucida	=	Metrosideros umbellatus
Sagus vitiensis	=	Metroxylon vitiensis
Magnolia annonaefolia	=	Michelia figo
Magnolia fusculata	=	Michelia figo
Michelia fuscata	=	Michelia figo
Cyanophylla magnificum	=	Miconia calvescens
Citrus australis	=	Microcitrus australis
Cocus wedelliana	=	Microcoelum weddellianum
Kentia gracilis	=	Microkentia gracilis
Microlepia Hirta cristata	=	Microlepia pyramidata
Beckia plicata	=	Micromyrtus ciliata
Baeckia micropylla	=	Micromyrtus ciliatus
Beckia plicata	=	Micromyrtus ciliatus
Micromyrtus microphyllus	=	Micromyrtus ciliatus
Polypodium scandens	=	Microsorium scandens
Diplacaus engleherstii	=	Mimulus aurantiacus
Diplacas glutinosus	=	Mimulus aurantica
Diplacus grandiflora	=	Mimulus bifidus
Diplacas hybrida	=	Mimulus hybrida
Mimulus duplex	=	Mimulus luteus
Diplacus puniceus	=	Mimulus puniceus
Diplacus splendens	=	Mimulus puniceus
Diplaucas Mrs Scholes	=	Mimulus puniceus
Mimulus Mrs scholes	=	Mimulus puniceus
Mirbelia reticulata	=	Mirbelia rubiifolia
Eulalia japonica	=	Miscanthus sinensis
Eulalia zebrina	=	Miscanthus sinensis
Gardenia citriodora	=	Mitriostigma axillare
Philodendron pertusum	=	Monstera deliciosa
Philodendron friedrichsthalii	=	Monstera friedrichsthalii
Cereus cavendishii	=	Monvillea cavendishii
Morus multicaulis	=	Morus alba
Morus tartarica	=	Morus alba
Murraya exotica	=	Murraya paniculata
Bannana drawf	=	Musa acuminata
Musa cavendishii	=	Musa acuminata
Musa zebrina	=	Musa acuminata
Bannana common	=	Musa Xparadisiaca
Musa lady's finger	=	Musa Xparadisiaca
Musa plantain	=	Musa Xparadisiaca
Musa sapientium	=	Musa Xparadisiaca
Myoporum cunnighamii	=	Myoporum acuminatum
Myoporum boobyalla	=	Myoporum insulare
Myoporum ellipticum	=	Myoporum insulare
Myoporum carsonii	=	Myoporum laetum
Myoporum tuberculatum	=	Myoporum serratum
Myoporum glandulosum	=	Myoporum viscosum
Eugenia floribunda	=	Myricaria floribunda
Eugenia pendula	=	Myricaria floribunda
Eugenia ventenatii	=	Myricaria floribunda
Eugenia jambosa	=	Myricaria jambos
Myroxylon pereira	=	Myroxylon balsamum
Myrtus acuminata	=	Myrtus communis
Myrtus grandiflorus	=	Myrtus communis
Myrtus microphyllus	=	Myrtus communis
Myrtus romanus	=	Myrtus communis
Columnea splendens	=	Nematanthus longipes
Myrtus pedunculata	=	Neomyrtus pedunculata
Panax arborea	=	Neopanax arboreus
Nothopanax laetum	=	Neopanax laetus
Nephrolepis davalliodies	=	Nephrolepis acuminata
Nephrolepis tuberosa	=	Nephrolepis cordifolia
Nephrolepis Anna Foster	=	Nephrolepis exaltata
Nephrolepis bostoniensis	=	Nephrolepis exaltata

Nephrolepis bridgesi	=	Nephrolepis exaltata
Nephrolepis compacta	=	Nephrolepis exaltata
Nephrolepis cristata	=	Nephrolepis exaltata
Nephrolepis furcans	=	Nephrolepis exaltata
Nephrolepis lycopodiodes	=	Nephrolepis exaltata
Nephrolepis marshallii	=	Nephrolepis exaltata
Nephrolepis piersoni	=	Nephrolepis exaltata
Nephrolepis roosevelti	=	Nephrolepis exaltata
Nephrolepis todeaoides	=	Nephrolepis exaltata
Nephrolepis tremula	=	Nephrolepis exaltata
Nephrolepis whitmani	=	Nephrolepis exaltata
Nerium odurum	=	Nerium oleander
Nerium splendens	=	Nerium oleander
Nierembergia azurea	=	Nierembergia scoparia
Dasylirion junicfolium	=	Nolina longifolia
Opuntia cochinilites	=	Nopalea cochenillifera
Fagus cunninghamii	=	Nothofagus cunninghamii
Ceanothus africanus	=	Notlea africana
Cereus serpentinus	=	Nyctocereus serpentinus
Ochna serrulata	=	Ochna multiflora
Thyrsacanthus rutilans	=	Odontonema schomburgkianum
Olea cunninghamii	=	Olea europaea
Olea sativa	=	Olea europaea
Olea vulgaris	=	Olea europaea
Euribya	=	Olearia
Aster argophyllus	=	Olearia argophylla
Euribya erubescens	=	Olearia myrsinoides
Aster aculeatus	=	Olearia ramulosa
Euribya aculeata	=	Olearia ramulosa
Aster liratus	=	Olearia stellulata
Euribya gunniana	=	Olearia stellulata
Euribya lirata	=	Olearia stellulata
Euribya rugosa	=	Olearia stellulata
Olearia gunniana	=	Olearia stellulata
Olearia dentata	=	Olearia tomentosa
Aster tomentosus	=	Olearia tomentosus
Cactus curassavica	=	Opuntia curassavica
Opuntia leucocantha	=	Opuntia ficus-indica
Opuntia decipiens	=	Opuntia imbricata
Opuntia boliviensis	=	Opuntia pentlandii
Opuntia flavicans	=	Opuntia robusta
Opuntia polyanthus	=	Opuntia tuna
Embothrium wickhami	=	Oreocallis pinnata
Embothrium wickhani	=	Oreocallis pinnata
Aralia reticulata	=	Oreopanax reticulatus
Chironia decussata	=	Orphium frutescens
Chironia frutescens	=	Orphium frutescens
Chironia grandiflora	=	Orphium frutescens
Lasiandra microphylla	=	Osbeckia kewensis
Olea armenicanus	=	Osmanthus americanus
Olea fragrans	=	Osmanthus fragrans
Olea ilicifolia	=	Osmanthus heterophyllus
Osmanthes aquifolium	=	Osmanthus heterophyllus
Osmanthes illicifolius	=	Osmanthus heterophyllus
Osmanthes variegata rara	=	Osmanthus heterophyllus
Osmanthus myrtifolius	=	Osmanthus heterophyllus
Nuttalia cerasiformis	=	Osmaronia cerasiformis
Osmunda palustris	=	Osmunda regalis
Andromeda arboreum	=	Oxydendrum arboreum
Callistachys ovata	=	Oxylobium callistachys
Justia coccinea	=	Pachystachys coccinea
Paeonia arborea	=	Paeonia suffruticosa
Paeonia moutan	=	Paeonia suffruticosa
Paliurus aculeatus	=	Paliurus spina-christi
Pandanus pacificus	=	Pandanus dubius
Pandanus javanicus	=	Pandanus utilis

Bignonia jasminoides	=	Pandorea jasminoides
Tecoma jasminoides	=	Pandorea jasminoides
Bignonia australis	=	Pandorea pandorana
Bignonia latrobei	=	Pandorea pandorana
Bignonia rosea(Mackenii in 1935)	=	Pandorea pandorana
Tecoma australis	=	Pandorea pandorana
Tecoma diversifolia	=	Pandorea pandorana
Tecoma latroberii	=	Pandorea pandorana
Veronica linifolia	=	Parahebe linifolia
Amphelopsis henryana	=	Parthenocissus henryana
Ampelopsis royals	=	Parthenocissus quinquefolia
Amphelopsis englemanii	=	Parthenocissus quinquefolia
Amphelopsis hederacea	=	Parthenocissus quinquefolia
Amphelopsis hirsutum	=	Parthenocissus quinquefolia
Amphelopsis muralis	=	Parthenocissus quinquefolia
Amphelopsis pubescens	=	Parthenocissus quinquefolia
Amphelopsis quinquedolia	=	Parthenocissus quinquefolia
Amphelopsis hoggii	=	Parthenocissus tricuspidata
Amphelopsis japonica	=	Parthenocissus tricuspidata
Amphelopsis lowii	=	Parthenocissus tricuspidata
Amphelopsis veitchii	=	Parthenocissus tricuspidata
Passiflora subpeltata	=	Passiflora alba
Tacsonia vem-volvemii	=	Passiflora antioquiensis
Disemma coccinea	=	Passiflora banksii
Murucuja adiantifolia	=	Passiflora banksii
Passiflora Constance elliot	=	Passiflora caerulea
Passiflora Enysford gem	=	Passiflora caerulea
Passiflora mayana	=	Passiflora caerulea
Tacsonia jamiesonii	=	Passiflora jamesonii
Tacsonia ignea	=	Passiflora manicata
Tacsonia moniculata	=	Passiflora manicata
Passiflora vestportilio	=	Passiflora misera
Tacsonia eriantha	=	Passiflora mixta
Tacsonia mollisima	=	Passiflora mollisima
Tacsonia taylori	=	Passiflora mollisima
Tacsonia tomentosa speciosa	=	Passiflora mollisima
Passiflora bananna	=	Passiflora mollissima
Tacsonia pinnatistipula	=	Passiflora pinnatistipula
Passiflora grandilla	=	Passiflora quadrangularis
Passiflora macrocarpa	=	Passiflora quadrangularis
Passiflora kermisina	=	Passiflora raddiana
Passiflora glauca	=	Passiflora stipulata
Passiflora oliveriana	=	Passiflora suberosa
Tacsonia buchonani	=	Passiflora vitifolia
Tacsonia exoniensis	=	Passiflora Xexoniensis
Paulownia imperialis	=	Paulownia tomentosa
Pavetta velutina	=	Pavetta indica
Pentas carnea	=	Pentas lanceolata
Pereskia godseffiana	=	Pereskia aculeata
Peristrophe lanceolata variegata	=	Peristrophe lanceolaria
Pernettya angustifolia	=	Pernettya mucronata
Pernettya bell's seedling	=	Pernettya mucronata
Pernettya speciosa	=	Pernettya mucronata
Persea gratissima	=	Persea americana
Camphora carolinensis	=	Persea borbonia
Lauras borbonia	=	Persea borbonia
Persoonia latifolia	=	Persoonia lanceolata
Petrophila pulchella	=	Petrea fucifolia
Petrea stapeliae	=	Petrea volubilis
Phebalium elatum	=	Phebalium billardierii
Philadelphus aurea	=	Philadelphus coronarius
Philadelphus dianthaeflours	=	Philadelphus coronarius
Philadelphus multiflorus	=	Philadelphus coronarius
Philadelphus primuloeflorus	=	Philadelphus coronerius
Philadelphus speciosa	=	Philadelphus indorus
Phil delphus grandifolius	=	Philadelphus inodorus

Philadelphus gordonianus	=	Philadelphus lewisii
Philadelphus latifolius	=	Philadelphus pubescens
Philadelphus atalas	=	Philadelphus Xcymosus
Philadelphus voi lactae	=	Philadelphus Xcymosus
Philadelphus avalanche	=	Philadelphus Xlemoinei
Philadelphus boule d'Argent	=	Philadelphus Xlemoinei
Philadelphus candalabbria	=	Philadelphus Xlemoinei
Philadelphus enchantment	=	Philadelphus Xlemoinei
Philadelphus mount blanc	=	Philadelphus Xlemoinei
Philadelphus rosacae	=	Philadelphus Xlemoinei
Philadelphus belle etoile	=	Philadelphus Xpurpureo-
Philadelphus fleur de neige	=	Philadelphus Xvirginalis
Phyllarea	=	Phillyrea
Pillyrea vilmoreana	=	Phillyrea decora
Phillyrea ligustrifolia	=	Phillyrea latifolia
Phyllica latifolia	=	Phillyrea latifolia
Philodendron panduraeforme	=	Philodendron bipennifolium
Philodendron cannifolium	=	Philodendron martianum
Philodendron andreanum	=	Philodendron melanochrysum
Philodendron sodiroi	=	Philodendron ornatum
Philodendron dubium	=	Philodendron radiatum
Philodendron micans	=	Philodendron scandens
Philodendron lindenianum	=	Philodendron verrucosum
Eriostemon salicifolius	=	Philotheca salsolifolia
Justia asperulea	=	Phlogacanthus asperulus
Phoenix leonensis macrocarpa	=	Phoenix canariensis
Phoenix tenuis	=	Phoenix canariensis
Phoenix cycadaefolia	=	Phoenix dactylifera
Phoenix farnifera	=	Phoenix pusilla
Phoenix pumila	=	Phoenix reclinata
Phoenix spinosa	=	Phoenix reclinata
Phormium purpurea	=	Phormium tenax
Bambusa communis	=	Phragmites australis
Podocarpus asplenifolius	=	Phyllocladus aspleniifolius
Phyllocladus alpinus	=	Phyllocladus trichomanoides
Bambusa aurea	=	Phyllostachys aurea
Bambusa castillionis	=	Phyllostachys bambusoides
Bambusa mitis	=	Phyllostachys bambusoides
Phyllostachys castilloni	=	Phyllostachys bambusoides
Bambusa nigra	=	Phyllostachys nigra
Bambusa puberulea	=	Phyllostachys nigra
Bambusa quiloi	=	Phyllostachys quiloi
Sphaeralcea rosea	=	Phymosia rosea
Spheralcia umbellata	=	Phymosia umbellata
GOOSEBERRY: CAPE	=	Physalis peruviana
Physalis edulis	=	Physalis peruviana
Neillia opulifolia	=	Physocarpus opulifolius
Spiraea opulifolia	=	Physocarpus opulifolius
Hoya campanulata	=	Physostelma wallichii
Phytolaccia decandra	=	Phytolacca americana
Abies excelsa	=	Picea abies
Abies smithiana	=	Picea abies
Picea septentrionalis	=	Picea abies
Pinus picea	=	Picea abies
Abies engelmanii	=	Picea engelmannii
Abies canadensis	=	Picea glauca
Abies coerulea	=	Picea glauca
Picea alba	=	Picea glauca
Picea albertiana conica	=	Picea glauca
Pinus coerulea	=	Picea glauca
Abies nigra	=	Picea mariana
Picea nigra	=	Picea mariana
Abies khutrow	=	Picea morinda
Abies orientalis	=	Picea orientalis
Abies Kosteriana glauca	=	Picea pungens
Abies parryana	=	Picea pungens

Abies pungens	=	Picea pungens
Picea kosteriana glauca	=	Picea pungens
Abies rubra	=	Picea rubens
Abies morinda	=	Picea smithiana
Andromeda floribunda	=	Pieris floribunda
Andromeda forrest	=	Pieris forrestii
Andromeda japonica	=	Pieris japonica
Andromeda phillyreifolia	=	Pieris phillyreifolia
Pimelea decustta	=	Pimelea ferruginea
Pinus tuberculata	=	Pinus attenuata
Pinus fertilis	=	Pinus cembroides
Pinus llaveana	=	Pinus cembroides
Pinus mexicana	=	Pinus cembroides
Pinus macrophylla	=	Pinus coulteri
Pinus Aucklandiana	=	Pinus gerardiana
Pinus brutia	=	Pinus halepensis
Pinus pyrenaica	=	Pinus halepensis
Pinus tenuifolia	=	Pinus maximinoi
Pinus fermontiana	=	Pinus monophylla
Pinus russelliana	=	Pinus montezumae
Pinus larico	=	Pinus mugo
Pinus montana	=	Pinus mugo
Pinus edgariana	=	Pinus muricata
Pinus austriaca	=	Pinus nigra
Pinus pallasiana	=	Pinus nigra
Pinus australis	=	Pinus palustris
Pinus maritima	=	Pinus pinaster
Pinus monspeliensis	=	Pinus pinaster
Pinus beardsleyii	=	Pinus ponderosa
Pinus benthamiana	=	Pinus ponderosa
Pinus parryana	=	Pinus quadrifolia
Pinus insingnis	=	Pinus radiata
Pinus rubra	=	Pinus resinosa
Pinus longifolia	=	Pinus roxburghii
Pinus excelsa	=	Pinus wallichiana
Piper futokadsura	=	Piper kadsura
Heimerliodendron variegata	=	Pisonia brunonianum
Pisonia grandis	=	Pisonia umbellifera
Albizia pruinosa	=	Pithecellobium pruinosa
Pittosporum macrocarpum	=	Pittosporum eugenioides
Pittosporum acaciodes	=	Pittosporum phillyraeoides
Pittosporum colensoi	=	Pittosporum tenuifolium
Pittosporum garnetti	=	Pittosporum tenuifolium
Pittosporum nigrescens	=	Pittosporum tenuifolium
Pittosporum variegata	=	Pittosporum undulatum
Gymnogramma peuviana	=	Pityrogramma calomelanos
Gymnogramma chrysophilla	=	Pityrogramma chrysophylla
Gynogramma lauchian	=	Pityrogramma chrysophylla
Gymnogramma wettenhalliana	=	Pityrogramma pulchella
Gymnogramma tartarea	=	Pityrogramma tartarea
Plagianthus tasmanicus	=	Plagianthus pulchellus
Plagianthus betulinus	=	Plagianthus regius
Achras australis	=	Planchonella australis
Sapota australis	=	Planchonella australis
Sapota costata	=	Planchonella costata
Platanus palmata	=	Platanus orientalis
Biota meldensis	=	Platycladus orientalis
Biota recurva	=	Platycladus orientalis
Chamaecyparis glauca	=	Platycladus orientalis
Thuja aurea	=	Platycladus orientalis
Thuja beveriensis	=	Platycladus orientalis
Thuja chinese	=	Platycladus orientalis
Thuja elegantissima	=	Platycladus orientalis
Thuja falcata	=	Platycladus orientalis
Thuja glauca	=	Platycladus orientalis
Thuja intermedia	=	Platycladus orientalis

Thuja meldensis	=	Platycladus orientalis
Thuja nepalensis	=	Platycladus orientalis
Thuja orientalis	=	Platycladus orientalis
Thuja tartarica	=	Platycladus orientalis
Platylobium macrocalyx	=	Platylobium obtusangulum
Owenia cerasifera	=	Pleiogynium solandri
Plumbago capensis	=	Plumbago auriculata
Plumbago rosea	=	Plumbago indica
Plumbago mexicana	=	Plumbago scandens
Plumeria acutifolia	=	Plumeria acuminata
Plumeria frangipanni	=	Plumeria acuminata
Plumeria rubra	=	Plumeria acuminata
Podochoemium paniculatum	=	Podachaenium eminens
Ferdinandia eminems	=	Podachaenium paniculatum
Podalyria grandifolia	=	Podalyria calyptrata
Podalyria stryracifolia	=	Podalyria calyptrata
Prumnopitys elegans	=	Podocarpus andinus
Dacrydium excelsum	=	Podocarpus dacrydioides
Dacrydium elatum	=	Podocarpus elatus
Podocarpus pruinosus	=	Podocarpus elongatus
Podocarpus koraiana	=	Podocarpus macrophyllus
Podocarpus longifolia	=	Podocarpus macrophyllus
Podocarpus sinensis	=	Podocarpus macrophyllus
Podocarpus taxifolia	=	Podocarpus montanus
Podocarpus pungens	=	Podocarpus totara
Bignonia Reginae Sabaea	=	Podranea brycei
Bignonia mackenii	=	Podranea ricasoliana
Tecoma mackeni	=	Podranea ricasoliana
Polygala grandiflora	=	Polygala chamaebuxus
Polygala attenuata	=	Polygala oppasitifolia
Polygala cordata	=	Polygala oppasitifolia
Polygala cordifolia	=	Polygala oppasitifolia
Polygala latifolia	=	Polygala oppasitifolia
Comospermum virgata	=	Polygala virgata
Polygala speciosa	=	Polygala virgata
Polygala grandis	=	Polygala X palmas
Polygonum compactum	=	Polygonum cuspidatum
Phlebodium aureum	=	Polypodium aureum
Polypodium attenuatum	=	Polypodium brownii
Polypodium vacillans	=	Polypodium loriceum
Microsorum irioides	=	Polypodium punctatum
Phlebodium irriod.s	=	Polypodium punctatum
Polypodium rugulosum	=	Polypodium punctatum
Phymatodes pustulatum	=	Polypodium pustulatum
Aralia ficifolia	=	Polyscias filicifolia
Panax fruticosa	=	Polyscias fruticosa
Aralia guilfoylei	=	Polyscias guilfoylei
Panax murrayi	=	Polyscias murrayi
Polystichum proliferum	=	Polystichum setiferum
Pomaderris phillyraefolia	=	Pomaderris phillyreoides
Pomax glabra	=	Pomax umbellata
Pomax hirta	=	Pomax umbellata
Populus argentea bolleana	=	Populus alba
Populus bolleana	=	Populus alba
Populus macrophylla	=	Populus canescens
Populus betulifolia	=	Populus nigra
Populus dilata	=	Populus nigra
Populus fastigata	=	Populus nigra
Populus italica	=	Populus nigra
Populus lombardii	=	Populus nigra
Populus monolifera	=	Populus nigra
Populus aurea	=	Populus Xcanadensis
Populus caroliana	=	Populus Xcanadensis
Populus nivea vel acerifolia	=	Populus Xcanadensis
Populus serotina	=	Populus Xcanadensis
Echites nutans	=	Prestonia venosa

Prostanthera coerulea	=	Prostanthera caerulea
Protea eximia	=	Protea latifolia
Protea aurea	=	Protea longifolia
Protea laticolor	=	Protea longifolia
Protea rosea	=	Protea nana
Protea scolymus	=	Protea scolymocephala
Cerasus caproniana	=	Prunus avium
Prunus pissardi	=	Prunus cerasifera
Prunus vesuv is	=	Prunus cerasifera
Cerasus multiplex	=	Prunus cerasus
Prunus caproniana ranunculiflora	=	Prunus cerasus
Prunus myrobolana	=	Prunus cerasus
Prunus rosea	=	Prunus cerasus
Amygdalus communis	=	Prunus dulcis
Prunus sinensis	=	Prunus glandulosa
Cerasus ilicifolia	=	Prunus ilicifolia
Cerasus laurocerasus	=	Prunus laurocerasus
Lauro certisus Cerasus	=	Prunus laurocerasus
Laurocerasus officinalis	=	Prunus laurocerasus
Cerasus lusitanica	=	Prunus lusitanica
Cerasus seiboldtii	=	Prunus serrulata
Prunus moserii	=	Prunus Xblireiana
Prunus pollardii	=	Prunus Xpollardii
Eranthemum alba marginatum	=	Pseuderanthemum aminatissimum
Eranthemum andersonii	=	Pseuderanthemum aminatissimum
Eranthum nigrescens	=	Pseuderanthemum atropurpureum
Eranthemum bicolor	=	Pseuderanthemum bicolor
Eranthemum tuberculatum	=	Pseuderanthemum tuberculatum
Eranthemum variable	=	Pseuderanthemum variable
Abies kaemkaempferli	=	Pseudolarix amabilis
Aralia crassifolia	=	Pseudopanax crassifolium
Aralia trifoliata	=	Pseudopanax crassifolium
Arundinaria japonica	=	Pseudosasa japonica
Bambusa arundinaria japonica	=	Pseudosasa japonica
Bambusa arundinaria japonica	=	Pseudosasa japonica
Bambusa japonica	=	Pseudosasa japonica
Bambusa japonica	=	Pseudosasa japonica
Abies douglasii	=	Pseudotsuga menziesii
Abies menziesii	=	Pseudotsuga menziesii
Picea douglassii	=	Pseudotsuga menziesii
Pseudotsuga douglasii	=	Pseudotsuga menziesii
Pseudotsuga taxifolia	=	Pseudotsuga menziesii
GUAVA (WHITE)	=	Psidium guajava
GUAVA (YELLOW)	=	Psidium guajava
Psidium aromatica	=	Psidium guajava
Psidium pomiferum	=	Psidium guajava
Psidium pyriferum	=	Psidium guajava
GUAVA (PURPLE)	=	Psidium littorale
Psidium cattleianum	=	Psidium littorale
Psidium luteum	=	Psidium littorale
Psidium cordatum	=	Psidium montanum
Psoralia	=	Psoralea
Grumilea capensis	=	Psychotria capensis
Pteris nemoralis	=	Pteris biaurita
Litobrochia comans	=	Pteris comans
Pteris cristata	=	Pteris cretica
Pteris ouvradii	=	Pteris cretica
Pteris wimjetti	=	Pteris cretica
Pteris flabellata	=	Pteris dentata
Pteris millanium	=	Pteris milneana
Pteris serrulata	=	Pteris multifida
Pteris ternifolia	=	Pteris multifida
Pteris argyraa	=	Pteris quadriaurita
Pteris longifolia	=	Pteris vittata
Pueraria thunbergia	=	Pueraria lobata
Punecea flore pleno	=	Punica granatum

Cotoneaster angustifolia	=	Pyracantha angustifolia
Crataegus gibbsii	=	Pyracantha atalantioides
Pyracantha gibbsii	=	Pyracantha atalantioides
Crataegus Pyracantha	=	Pyracantha coccinea
Mespilus pyracantha	=	Pyracantha coccinea
Crataegus crenulata	=	Pyracantha crenulata
Pyracantha yunnanensis	=	Pyracantha fortuneana
Bignonia venusta	=	Pyrostegia venusta
Pyrostegia ignea	=	Pyrostegia venusta
Tecoma venusta	=	Pyrostegia venusta
Pyrus chinensis	=	Pyrus communis
Quercus serrata	=	Quercus acutissima
Quercus leucombrian	=	Quercus cerris
Quercus scarlet	=	Quercus coccinea
Quercus triloba	=	Quercus falcata
Quercus lanata	=	Quercus leucotricophora
Quercus aegilops	=	Quercus macrolepis
Quercus castanea	=	Quercus muehlenbergii
Quercus sessiliflora	=	Quercus petraea
Quercus discolor	=	Quercus prinus
Quercus spicata	=	Quercus reticulata
Quercus concordia	=	Quercus robur
Quercus fastigiata	=	Quercus robur
Quercus microcarpa	=	Quercus robur
Quercus microcarpa	=	Quercus robur
Quercus pendunculata	=	Quercus robur
Quercus americana rubra	=	Quercus rubra
Quercus tinctoria	=	Quercus velutina
Quercus virens	=	Quercus virginiana
Quisqualis glabra	=	Quisqualis indica
Quisqualis pubescens	=	Quisqualis indica
Gardenia whitfieldii	=	Randia malleifera
Myrsine variabilis	=	Rapanea variabilis
Linum trigynum	=	Reinwardtia trigyna
Rhamnus variegata	=	Rhamnus alaternus
Rhaphiolepis ovata	=	Rhaphiolepis umbellata
Chamaerops excelsa	=	Rhapis excelsa
Rhapis flabelliformis	=	Rhapis excelsa
Rhapis flabelliformis	=	Rhapis excelsa
Rhodochiton volubile	=	Rhodochiton atrosanguineum
Lophospermun atrosanguineum	=	Rhodochiton volubile
Azalea	=	Rhododendron
Rhododendron calendulacea	=	Rhododendron calendulaceum
Rhododendron gibsonii	=	Rhododendron formosum
Rhododendron lindleyanum	=	Rhododendron lindleyi
Rhododendron californicum	=	Rhododendron macrophyllum
Rhododendron sinense	=	Rhododendron molle
Rhododendron ledifolia	=	Rhododendron mucronatum
Rhododendron ovata	=	Rhododendron ovatum
Rhododendron elegans	=	Rhododendron pauciflorum
Rhododendron phoenicia	=	Rhododendron pulchrum
Rhododendron yayehiryu	=	Rhododendron Xyayegiri
Myrtus tomentosus	=	Rhodomyrtus tomentosa
Rhus rhodanthemum	=	Rhodosphaera rhodanthema
Rhodotypos kerroides	=	Rhodotypos scandens
Vitis capensis	=	Rhoicissus capensis
Areca baueri	=	Rhopalostylis baueri
Areca sapida	=	Rhopalostylis sapida
Rhus osbeckii	=	Rhus chinensis
Rhus semi-alata	=	Rhus chinensis
Rhus venenta	=	Rhus vernix
Ribes grossularia	=	Ribes uva-crispa
Ricinus cambodgiensis	=	Ricinus communis
Ricinus gibsonii	=	Ricinus communis
Ricinus sanguinea	=	Ricinus communis
Rivina brasiliensis	=	Rivina humilis

Rivina laevis	=	Rivina humilis
Acacia hispida rosea	=	Robinia hispida
Acacia:rose	=	Robinia hispida
Robinia rosea	=	Robinia hispida
Robinia bessoniania	=	Robinia pseudo-acacia
Acacia pseudoacacia	=	Robinia pseudoacacia
Gleditsia pseudoacacia	=	Robinia pseudoacacia
Robinea monophylla	=	Robinia pseudoacacia
Robinia decaisneana	=	Robinia Xambigua
Crassula coccinea	=	Rochea coccinea
Kalosanthus coccineus	=	Rochea coccinea
Romneya trichocalyx	=	Romneya coulteri
Rondeletia strigosa	=	Rondeletia anomala
Rondeletia versicolor	=	Rondeletia anomala
Rondeletia speciosa	=	Rondeletia odorata
Rosa muscosa	=	Rosa centifolia
ROSE MOSS	=	Rosa centifolia
Rosa indica	=	Rosa chinensis
Rosa semperflorens	=	Rosa chinensis
Rosa sinica	=	Rosa chinensis
Rosa fulgens	=	Rosa cinnamomea
Rosa ferox	=	Rosa horrida
Rosa lucida duplex	=	Rosa virginiana
Gardenia globosa	=	Rothmannia globosa
Gardenia stranleyana	=	Rothmannia longiflora
Rhoupala corcouadensis	=	Roupala macrophylla
Oreodoxia regia	=	Roystonea regia
Rubus eglanteria	=	Rubus rosifolius
LOGANBERRIES	=	Rubus ursinus
Rudbeckia bicolor superbra	=	Rudbeckia hirta
Rudbeckia golden glow	=	Rudbeckia laciniata
Dipteracanthus affinis	=	Ruellia affinis
Ruellia formosa	=	Ruellia elegans
Dipteracanthus herbstii	=	Ruellia herbstii
Ruellia lilacina	=	Ruellia schauerana
Commersonia disyphylla	=	Rulingia pannosa
Ruscus latifolius	=	Ruscus aculeatus
Russelia juncea	=	Russelia equisetiformis
Russelia multiflora	=	Russelia sarmentosa
Sabal umbraculifera	=	Sabal blackburniana
Sabal adamsonii	=	Sabal minor
Salix coerulea	=	Salix alba
Salix vitellina	=	Salix alba
Salix aurea	=	Salix babylonica
Salix humboldtii	=	Salix chilensis
Salix Russellisus	=	Salix fragilis
Salix tortulosa	=	Salix matsudana
Salix laurina	=	Salix phylicifolia
Salix forbyana	=	Salix purpurea
Salix helix	=	Salix purpurea
Salix amygdalina	=	Salix triandra
Salix hoffmannion	=	Salix triandra
Salix lanceolata	=	Salix triandra
Salix salamonii	=	Salix Xsepulcralis
Salvia liliana	=	Salvia azurea
Audibertia incana	=	Salvia clovrii
Salvia compacta	=	Salvia coccinea
Salvia rutilans	=	Salvia elegans
Salvia hoyeyi	=	Salvia ianthina
Salvia betheli	=	Salvia involucrata
Salvia africana	=	Salvia leucantha
Salvia barbata	=	Salvia leucantha
Salvia vulgaris	=	Salvia officinalis
Salvia bruanti	=	Salvia splendens
Salvia glory of stuttgart	=	Salvia splendens
Salvia issanchon	=	Salvia splendens

Salvia superba	=	Salvia Xsuperba
Sambucus aurea	=	Sambucus nigra
Sambucus folis argentea	=	Sambucus nigra
Sambucus folis aurea	=	Sambucus nigra
Sambucus variegatus	=	Sambucus nigra
Sambucus xanthocarpa	=	Sambucus pubens
Sambucus lacinata	=	Sambucus racemosa
Fusanus acuminatus	=	Santalum acuminatum
Santolina pectinata	=	Santolina acuminatum
Santolina incana	=	Santolina chamaecyparissus
Stokesia cynea	=	Sapium laevis
Stillingia sebifera	=	Sapium sebiferum
Sarcococca humilis	=	Sarcococca hookerana
Bignonia magnifica	=	Saritaea magnifica
Bambusa palmata	=	Sasa palmata
Bambusa veitchi	=	Sasa veitchii
Lauras sassafras	=	Sassafras albidum
Taxus saxegotha conspicua	=	Saxegothaea conspicua
Scaevola microcarpa	=	Scaevola albida
Scaevola suaveolens	=	Scaevola calendulacea
Scaevola taccada	=	Scaevola koeningii
Justica fulvicoma	=	Schaveria fulvicoma
Aralia schefferi	=	Schefflera digitata
Heptapleurum venulosum	=	Schefflera venulosa
Schima norhonae	=	Schima wallichii
Pothos argyrea	=	Schindapsus pictus
Schinus areira	=	Schinus molle
Duvaua dependens	=	Schinus polygamus
Duvaua longifolia	=	Schinus polygamus
Schotia speciosa	=	Schotia afra
Schotia tamarindifolia	=	Schotia afra
Podocarpus verticellatus	=	Sciadopitys verticillata
Cereus armatus	=	Selenicereus grandiflorus
Cereus grandiflorum	=	Selenicereus grandifolium
Cereus rostratus	=	Selenicereus hamatus
Cereus macdonaldii	=	Selenicereus Macdonaldiae
Cereus nycticalus	=	Selenicereus pteranthus
Cereus spinulosus	=	Selenicereus spinulosus
Cineraria maritima	=	Senecio cinerea
Cacalia ficoides	=	Senecio ficoides
Senecio scandens	=	Senecio mikaniodes
Senecio leucostachys	=	Senecio vira-vira
Taxodium sempervirens	=	Sequoia sempervirens
Wellingtonia gigantea	=	Sequoiadendron giganteum
Serissa japonica	=	Serissa foetida
Agti grandiflora	=	Sesbania grandiflora
Daubentonia punicea	=	Sesbania punicea
Bambusa viminalis	=	Shibataea kumasaca
Bambusa ruscifolia	=	Shibataea kumassa
Spiraea laevigata	=	Siberaea laevigata
Stenogasta concinea	=	Sinningia concinna
Skimmia oblongata	=	Skimmia japonica
Smilax latifolia	=	Smilax australis
Smilax sarsaparilla	=	Smilax glauca
Solandra laevis	=	Solandra longifolia
Solandra nitida	=	Solandra maxima
Solanum laciniatum	=	Solanum aviculare
Solanum verbascifolium	=	Solanum erianthum
Solanum warscewiezii	=	Solanum hispidum
Solanum weatherilli	=	Solanum pseudocapsicum
Sollya drummondii	=	Sollya parviflora
Edwardsia grandiflora	=	Sophora tetraptera
Sophora grandifloria	=	Sophora tetraptera
Edwardsia microphylla	=	Sophora tetraptera(pre 1900)
Spiraea aitchisoni	=	Sorbaria aitchisonii
Spiraea grandifolia	=	Sorbaria grandifolia

Spiraea lindleyana	=	Sorbaria sorbifolia
Crataegus aria	=	Sorbus aria
Pyrus aria	=	Sorbus aria
Pyrus aucuparia	=	Sorbus aucuparia
Pyrus discolor	=	Sorbus aucuparia
Sorbus vestita	=	Sorbus cuspidata
Pyrus domestica	=	Sorbus discolor
Cytisus junceus	=	Spartium junceum
Genista juncea	=	Spartium junceum
Alsophila cooperi	=	Sphaeropteris cooperi
Alsophila grande	=	Sphaeropteris cooperi
Cyathea cooperi	=	Sphaeropteris cooperi
Cyathea medullaris	=	Sphaeropteris medullaris
Spiraea rupestris	=	Spiraea blumei
Spiraea indica	=	Spiraea canescens
Spiraea reevesiana	=	Spiraea cantoniensis
Spiraea rosea	=	Spiraea densiflora
Spiraea splendens	=	Spiraea densiflora
Spiraea callosa	=	Spiraea japonica
Spiraea fortuneii	=	Spiraea japonica
Spiraea anthony waterer	=	Spiraea Xbumalda
Spiraea nobleana	=	Spiraea Xsanssouciana
Ponceltia sprengelioides	=	Sprengelia ponceletia
Roxburghia gloriosoides	=	Stemona tuberosa
Roxburghia viridiflora	=	Stemona tuberosa
Agnostus	=	Stenocarpus
Argodendron trifoliata	=	Stenocarpus sinuatus
Stephanandra hernondifolia	=	Stephanandra hernandifolia
Stephanandra flexuosa	=	Stephanandra incisa
Stephanotis jasmine	=	Stephanotis floribunda
Stranvaesia salicifolia	=	Stranvaesia davidiana
Strelitizia augusta	=	Strelitizia alba
Strelitizia angustifolia	=	Strelitizia reginae
Strelitizia juncea	=	Strelitizia reginae
Strelitizia parvifolia	=	Strelitizia reginae
Browalia jamesonii	=	Streptosolen jamesonii
Goldfussia anisophylla	=	Strobilanthes anisophyllus
Goldfussia glomerata	=	Strobilanthes glomeratus
Goldfussia isophylla	=	strobilanthes isophylla
Christia grandiflora	=	Strophanthus speciosus
Strophanthus capensis	=	Strophanthus speciosa
Colutea frutescens	=	Sutherlandia frutescens
Indigofera coccinea	=	Swainsona galegifolia
Swainsona alba	=	Swainsona galegifolia
Swainsona coronillaefolia	=	Swainsona galegifolia
Swainsona osbornei	=	Swainsona galegifolia
Swainsona rosea	=	Swainsona galegifolia
Symphoria racemosa	=	Symphoricarpos albus
Symphoricarpos racemosa	=	Symphoricarpos albus
Symphoricarpos variegatus	=	Symphoricarpos orbiculatus
Symphoricarpos vulgaris	=	Symphoricarpos orbiculatus
Syncarpia laurifolia	=	Syncarpia glomulifera
Syngonium albo-lineatum	=	Syngonium angustatum
Philodendron trifoliatum	=	Synogonium auritum
Trichila glandolosa	=	Synoum glandulosum
Syringa velutina	=	Syringa patula
Syringa japonica	=	Syringa reticulata
Syringa siberian	=	Syringa reticulata
Syringa alba	=	Syringa vulgaris
Eugenia aquea	=	Syzygium aqueum
Eugenia cyanocarpa	=	Syzygium coolminianum
Acmena pendula	=	Syzygium floribundum
Jambos vulgaris	=	Syzygium jambos
ROSE APPLE	=	Syzygium jambos
Eugenia leuhamanni	=	Syzygium luehmannii
Jambos malaccensis	=	Syzygium malaccensis

Acmena myrtifolia	=	Syzygium paniculatum
Eugenia australis	=	Syzygium paniculatum
Jambos australis	=	Syzygium paniculatum
Tecoma heterophylla	=	Tabebuia heterophylla
Tecoma rosea	=	Tabebuia rosea
Cerbera manghas	=	Tabernaemontana dichotoma
FORBIDDEN FRUIT	=	Tabernaemontana dichotoma
Tabernaemontana coronoria	=	Tabernaemontana divaricata
Pittosporum flavum	=	Tabernaemontana laurifolia
Tamarix articula	=	Tamarix aphylla
Tamarix articulata	=	Tamarix aphylla
Tamarix japonica	=	Tamarix chinensis
Tamarix juniperina	=	Tamarix chinensis
Tamarix plumosa	=	Tamarix chinensis
Tamarix algeriensis	=	Tamarix gallica
Tamarix aestivalis	=	Tamarix ramosissima
Tamarix odessana rubra	=	Tamarix ramosissima
Tamarix pentandra	=	Tamarix ramosissima
Tanghinia veneniflua	=	Tanghinia venenifera
Cupressus distisha	=	Taxodium distichum
Taxodium nutans	=	Taxodium distichum
Taxodium virens	=	Taxodium distichum
Taxodium pinnatum	=	Taxodium mucronatum
Taxus adpressa	=	Taxus baccata
Taxus elagantissima	=	Taxus baccata
Taxus erecta	=	Taxus baccata
Taxus fastigata	=	Taxus baccata
Taxus hybernica	=	Taxus baccata
Taxus washingtoniana	=	Taxus baccata
Stenolobium alatum	=	Tecoma alata
Tecoma smithii	=	Tecoma alata
Bignonia mollie	=	Tecoma stans
Stenolobium satans	=	Tecoma stans
Tecoma mollis	=	Tecoma stans
Tecoma sorbifolia	=	Tecoma stans
Tecoma velutina	=	Tecoma stans
Tecoma speciosa	=	Tecomanthe speciosa
Bignonia capensis	=	Tecomaria capensis
Tecoma capensis	=	Tecomaria capensis
Deparia moorei	=	Tectaria moorei
Ternstroemia japonica	=	Ternstroemia gymnanthera
Callitris quadrivalvis	=	Tetraclinis articulata
Aralia papriferus	=	Tetrapanax papriferus
Tetratheca baueraefolia	=	Tetratheca ciliata
Tetratheca rubioides	=	Tetratheca ericifolia
Teucrium maritima	=	Teucrium marum
Dryopteris dentata	=	Thelypteris dentata
Goniopteris pennigera	=	Thelypteris pennigera
Polypodium pennigera	=	Thelypteris pennigera
Hibiscus lampas	=	Thespesia lampas
Cerbera thevetia	=	Thevetia peruviana
Tryptonema	=	Thryptomene
Thryptomene mitchelliana	=	Thryptomene calycina
Thunbergia alba	=	Thuja alata
Thunbergia aurantiaca	=	Thuja alata
Thuja obtusa	=	Thuja occidentalis
Frenella glauca	=	Thuja orientalis
Thuja gigantea	=	Thuja plicata
Thuja lobbii	=	Thuja plicata
Thuja zebrina	=	Thuja plicata
Thujopsis standishii	=	Thuja standishii
Thujopsis laetevirens	=	Thujopsis dolabrata
Hexacentris coccinea	=	Thunbergia coccinea
Meyenia erecta	=	Thunbergia erecta
Thunbergia javanicum	=	Thunbergia fragrans
Thunbergia gibsoni	=	Thunbergia gregorii

Thunbergia harrisii	=	Thunbergia laurifolia
Hexacentris mysorensis	=	Thunbergia mysorensis
Meyenia vogelliana	=	Thunbergia vogeliana
Thymus nitidus	=	Thymus richardii
Thymus coccineus	=	Thymus serpyllum
Thymus argentea marginata	=	Thymus vulgaris
Lasiandra fontanesiana	=	Tibouchina granulosa
Lasiandra heteromala	=	Tibouchina heteromala
Melastoma heteromalia	=	Tibouchina heteromalia
Pleroma hetromallum	=	Tibouchina heteromalla
Pleroma sarmentosa	=	Tibouchina laxa
Lasiandra Grandiflora	=	Tibouchina semidecandra
Lasiandra macrantha	=	Tibouchina semidecandra
Lasiandra orandiflora	=	Tibouchina semidecandra
Melastoma macrantha	=	Tibouchina semidecandra
Tibouchina semidecandra	=	Tibouchina urvilleana
Panax elegans	=	Tieghemopanax elegans
Tilia grandifolia	=	Tilia platyphyllos
Tilia rubra	=	Tilia platyphyllos
Tilia argentea	=	Tilia tomentosa
Todea africana	=	Todea barbara
Cederala australis	=	Toona australis
Torreya myristica	=	Torreya californica
Caryotaxus japonica	=	Torreya nucifera
Rhycospermum japonicum latifolia	=	Trachelospermum jasminoides
Rhycospermum jasminoides	=	Trachelospermum jasminoides
Rhycospermum reptans	=	Trachelospermum jasminoides
Chamaerops fortunii	=	Trachycarpus fortunii
Chamaerops martiana	=	Trachycarpus martianus
Cactus chiliensis	=	Trichocereus chiloensis
Cereus chiloensis	=	Trichocereus chiloensis
Pavonia multiflora	=	Triplochlamys multiflora
Lophostemon australis	=	Tristania conferta
Lophostemon australis	=	Tristania conferta
Tristania australis	=	Tristania conferta
Acacia albicans	=	Trypithecolobium albicans
Abies Brunoniana	=	Tsuga dumosa
Abies mertersiana	=	Tsuga heterophylla
Abies williamsoni	=	Tsuga mertensiana
Abies hanburyana	=	Tsuga sieboldii
Eugenia ugni	=	Ugni molinae
Myrtus ugni	=	Ugni molinae
Ulmus purpurea	=	Ulmus carpinifolia
Ulmus umbraculifera	=	Ulmus carpinifolia
Ulmus exionensis	=	Ulmus glabra
Ulmus horizontalis	=	Ulmus glabra
Ulmus major	=	Ulmus glabra
Ulmus montana	=	Ulmus glabra
Ulmus scabra	=	Ulmus glabra
Ulmus europea	=	Ulmus laevis
Ulmus sinensis	=	Ulmus parvifolia
Ulmus virgata	=	Ulmus parvifolia
Ulmus berafidii	=	Ulmus procera
Ulmus campestris	=	Ulmus procera
Ulmus louis van houtte	=	Ulmus procera
Ulmus medio argentea	=	Ulmus procera
Ulmus monumentalis	=	Ulmus procera
Ulmus viminalis	=	Ulmus procera
Ulmus wentworthii	=	Ulmus procera
Ulmus suberosa	=	Ulmus thomasii
Ulmus montana vegeta	=	Ulmus vegeta
Ulmus latifolia	=	Ulmus Xhollandica
Ulmus wreedi aurea	=	Ulmus Xhollandica
Ulmus chicester	=	Ulmus Xvegeta
Oreodombeya californica	=	Umbellularia californica
Viburnum fragrans	=	Viburnum farreri

Viburnum punctatum	=	Viburnum nudum
Viburnum obovata	=	Viburnum obovatum
Viburnum awafuki	=	Viburnum odoratissimum
Viburnum sinense	=	Viburnum odoratissimum
Viburnum americanum	=	Viburnum opulus
Viburnum tomentosum	=	Viburnum plicatum
Viburnum rugosum	=	Viburnum rigidum
Viburnum reticulatum	=	Viburnum sieboldii
Viburnum laurustinus	=	Viburnum tinus
Viburnum lucidum	=	Viburnum tinus
Viburnum standishii	=	Viburnum tinus
Phaseolus carcalla	=	Vigna caracalla
Vinca alba	=	Vinca minor
Vinca coerula	=	Vinca minor
Virgilia oroboides	=	Virgilia capensis
Virgilia rubenoides	=	Virgilia capensis
Vitex arborea	=	Vitex negundo
Vitex argentea	=	Vitis agnus-castus
Vitex variegateus	=	Vitis agnus-castus
Amphelopsis alicante bouchet	=	Vitis amurensis
Vitis alicante Bouchet	=	Vitis amurensis
Amphelopsis sieboldtii	=	Vitis thunbergii
Vitex ovata	=	Vitis trifolia
Brahea filamentosa	=	Washingtonia filifera
Pritchardia filifera	=	Washingtonia filifera
Brahea robusta	=	Washingtonia robusta
Brahea sonorae	=	Washingtonia robusta
Washingtonia sonorae	=	Washingtonia robusta
Hoya virdiflorus	=	Wattakaka volubilis
Weigela amabilis	=	Weigela coraeensis
Weigela arborea grandiflora	=	Weigela coraeensis
Weigela abel cariiere	=	Weigela floribunda
Weigela alba	=	Weigela floribunda
Weigela candidissima	=	Weigela florida
Weigela canida	=	Weigela florida
Weigela Eva Rathae	=	Weigela florida
Weigela hendersonii	=	Weigela florida
Weigela rosea	=	Weigela florida
Weigela van houttii	=	Weigela florida
Weigela variegata	=	Weigela florida
Weigela verschaffetti	=	Weigela florida
Weigela conquete	=	Weigela praecox
Weigela le printempts	=	Weigela praecox
Diervilla rosea	=	Weigela rosea
Weigela lavallei	=	Weigela Xwagneri
Weigela isoline	=	Weigelia florida
Callitris capensis	=	Widdringtonia cupressoides
Cupressus africanus	=	Widdringtonia cupressoides
Cupressus juniperina	=	Widdringtonia juniperoides
Wigandia vigeri	=	Wigandia caracasana
Wisteria multijuga	=	Wisteria floribunda
Wisteria purpurea	=	Wisteria floribunda
Wisteria rosea	=	Wisteria floribunda
Glycine frutescens	=	Wisteria frutescens
Wisteria magnifica	=	Wisteria macrostachya
Glycine sinese	=	Wisteria sinensis
Wisteria chinensis	=	Wisteria sinensis
Wisteria consequana	=	Wisteria sinensis
Woodwardia japonica	=	Woodwardia orientalis
Lysinema pungens	=	Woollsia pungens
Xanthorrhoea hastilis	=	Xanthorrhoea resinosa
Mespilus grandiflora	=	XCrataegomespilus grandiflora
Cactus mallisoni	=	XHeliaporos smithii
Berberis illicifolia	=	XMahoberberis neubertii
Xylosma senticosum	=	Xylosma congestum
Yucca crenulata	=	Yucca aloifolia

Yucca draconis	=	Yucca aloifolia
Yucca quadricolor	=	Yucca aloifolia
Yucca serrulata	=	Yucca aloifolia
Yucca tricolor	=	Yucca aloifolia
Yucca variegata	=	Yucca aloifolia
Yucca gigantea	=	Yucca elephantipes
Yucca superbra	=	Yucca gloriosa
Planera acuminata	=	Zelkova serrata
Zelkova acuminata	=	Zelkova serrulata
Andromeda speciosa	=	Zenobia pulverulenta
Zieria lanceolata	=	Zieria smithii
Ziziphus chinensis	=	Ziziphus jujuba
Ziziphus vulgaris	=	Ziziphus paliurus

APPENDIX 7: THE MODELED INVASIVE SCORE FOR EACH SPECIES, TOGETHER WITH THE ATTRIBUTE COMPONENTS OF THAT SCORE.

KEY

FAM = FAMILY

1 = Asteraceae
2 = Berberidaceae
3 = Bignoniaceae
4 = Corniflorae
5 = Cupressaceae
6 = Magnoliiflorae
7 = Fabaceae
8 = Fagaceae
9 = Labiateceae
10 = Mimosaceae
11 = Myrtaceae
12 = Oleaceae
13 = Palmae
14 = Pinaceae
15 = Proteaceae
16 = Rosaceae
17 = Rubiaceae
18 = Rutaceae
19 = Salicaceae
21 = Solanaceae
22 = Monocots
0 = Other family

D = DIOECIOUS

0 = No
1 = Yes

LF = LIFE-FORM

1 = All Other Life-forms
2 = Tropical Evergreen Microphyll Tree
3 = Tropical Evergreen Sclerophyll Tree
4 = Warm Temperate Broad Evergreen Tree
5 = Mediterranean Broad Evergreen Tree
7 = Summergreen Broad Leaved Tree
9 = Temperate Rainforest Needle Tree
10 = Mediterranean Needle Leaved Tree
12 = Temperate Needle Tree
16 = Tropical Broad Evergreen Small Tree
18 = Temperate Broad Evergreen Small Tree
19 = Broad Summergreen Small Tree
20 = Needle Leaved Small Tree
21 = Palm
24 = Xeric Evergreen Tuft Treelet
26 = Tropical Broad Evergreen Shrub
27 = Mediterranean Evergreen Shrub
28 = Temperate Broad Evergreen Shrub
31 = Needle Leaved Evergreen Shrub
32 = Mediterranean Drawf Shrub
33 = Temperate Evergreen Drawf Shrub
34 = Bush Stem Succulent
37 = Tropical Broad Evergreen Liana
38 = Broad Evergreen Vine
39 = Broad Summergreen Vine
40 = Mesic Summergreen Shrub

D = DISPERSAL

1 = Wind (seeds <15mg or to 25mg if winged)
2 = Wind (seeds winged + > 25mg)
3 = Water
4 = Ballistic
5 = Ant
6 = Bird
7 = Mammal, Reptile + Cache (Bird).

S = SEED LIFE

1 = < 3 years
2 = 3-15 years
3 = > 15 years

R = ASEXUAL REPRODUCTION

1 = No
2 = Yes

G = ANNUAL SHOOT GROWTH RATE

1 = < 30cm
2 = 30 - 60cm
3 = > 60cm

C = CHROMOSOME NUMBER

1 = <16
2 = 16 - 24
3 = 25 - 35
4 = 36 - 45
5 = 46 - 57
6 = 58 - 75
7 = >75

F = TIME TILL 1ST FLOWERING

1 = < 2 years
2 = 2 - 5 years
3 = > 5 years

W = SEED WEIGHT

1 = <1mg
2 = 1 - 4mg
3 = 5 - 9mg
4 = 10 - 25mg
5 = 26 - 150mg
6 = > 150mg

K = OCCURENCE IN KOPPEN'S CS ZONE

0 = No
1 = Yes

SYD = SYDNEY
MEL = MELBOURNE
ADE = ADELAIDE
CAN = CANBERRA

Numbers under these headings relate to **NIX'S MINIMUM CLIMATIC DISTANCE** such that:

1 = 0 - 250 (i.e. close climatic match)
2 = 251 - 350
3 = 351 - 400
4 = 401 - 450
5 = 451 - 500
6 = 501 - 600
7 = 601 - 700
8 = 701 - 800
9 = 801 - 1000
10 = >1000

W = INTRUSIVE SPECIES

0 = Non-intrusive
1 = Immigrant
2 = Invasive

EN = NUMBER OF ENVIRONMENTAL UNITS OVER WHICH A SPECIES OCCURS

1 = < 20
2 = 20 - 25
3 = 26 - 30
4 = 31 - 35
5 = 36 - 40
6 = 41 - 50
7 = 51 - 60
8 = 61 - 75
9 = 76 - 100
10 = > 100

APPENDIX 7: PLANT ATTRIBUTES AND THE INVASIVE SPECIES MODEL SCORE

Note: Species underlined and asterisked * are known to be intrusive in areas of similar climate to South-eastern Australia. Species only underlined have a close relative of similar form intrusive in areas of similar climate to South-eastern Australia. To incorporate this weed history factor into the Invasive Species Model Score add 50 to the score of all underlined species and a further 50 for all asterisked * species.

SPECIES	PHYSICAL FEATURES												CLIMATIC FEATURES										
	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Abelia chinensis	04	40	2		1			0			0	6	0	10	0	8	0	7	0	7	0	-140
Abelia schumannii	04	40	2		1			0			0							7	0	4	0	-150
Abelia uniflora	04	28	2		1			0			0	6	0	10	0			8	0	3	0	-40
Abies nordmanniana	14	1	1	1	1			0			0			2	0	2	0			6	0	-30
Abies pinsapo	14	1	1	1	1			0			1			9	0	4	0			3	0	+50
Abutilon grandifolium *	0	26	0	2	1			0					1								1	
Abutilon megapotamicum	0	26	0	2	1			0			0			6	0					6	0	-50
Abutilon pictum	0	26	0	2	1			0			0	1	0	6	0					7	0	+50
Acacia baileyana *	10	18	5	3	1			0			0	2	2	2	2	2	2	1	2	2	2	+170
Acacia boormanii	10	31	0	3	1			0			0			2	1			10	0	2	1	-20
Acacia cardiophylla	10	18	5	3	1			0			0							1	0	3	0	+100
Acacia cultriformis	10	27	5	3	1	2		0			0	2	0	1	0	1	0	1	1	2	1	+140
Acacia cyclops *	10	18	6	3	1	2		0			1					1	1			4	1	+190
Acacia dealbata *	10	02	5	3	2	3		0			1	1	0			1	2			6	2	+430
Acacia decora	10	27	5	3	1			0			0					1	0	1	0	7	0	+160
Acacia decurrens *	10	02	5	3	2	3		0			0			1	1	1	1	2	2	4	2	+290
Acacia drummondii	10	18	5	3	1			0			1						1			4	1	
Acacia fimbriata	10	31	5	3	1			0									1				1	
Acacia floribunda	10	18	5	3	1			0			0			3	1			5	0	5	1	+50
Acacia howittii	10	27	0	3	1			0			0			1	1			6	0	2	1	+100
Acacia iteaphylla	10	31	5	3	1			0			1						1	6	0	3	1	+160
Acacia longifolia *	10	18	5	3	1	2		0			1							2	0	7	0	+130
Acacia mearnsii *	10	02	5	3	1	3		0								1	1				1	+250
Acacia podalyriifolia *	10	27	5	3	1	3		0			0	1	1	1	1	5	2	2	0	4	2	+180
Acacia prominens	10	27	5	3	1			0							1						1	
Acacia saligna *	10	18	5	3	1	3		0			1	5	1	4	1	1	2			3	2	+220
Acacia sclerosperma	10	27		3	1			0			0					4	1			5	1	+30
Acacia spectabilis	10	27	5	3	1			0			0	1	0	2	0			1	0	5	0	+170
Acacia suaveolens	10	27	5	3	1			0			0							2	0	6	0	+90
Acacia terminalis *	10	02	5	3	2			0			0			2	2			2	1	6	2	+240
Acacia vestita	10	18	5	3	1			0			0							1	0	4	0	+140
Acalypha wilkesiana *	0	16	0		1		3	0			0	9	0							2	0	-200
Acer japonicum	0	19	2	1	1	1	3	0			0	6	0	9	0	9	0	7	0	5	0	-80
Acer negundo *	0	07	2	1	1	3	3	1		5	1	1	1	3	0	2	1	2	1	9	1	+250
Acer palmatum	0	19	2	1	1	1	3	0			0	6	0	9	1	3	0	7	0	5	1	-70
Acer platanoides	0	07	2	1	1		3	0		6	0	2	0	1	0			1	0	8	0	+70
Acer pseudoplatanus *	0	07	2	1	2		6	0	3	5	1	1	0	1	2	1	2	1	0	8	2	+380
Acer rubrum	0	07	2	1	2	2	7	0	3	4	0							5	0		0	+140
Acer saccharinum	0	07	2	1	1	3		0	3	6	0			3	0			5	0	7	0	+20
Acer saccharum	0	07	2	1	1	1	3	0	3	5	0							5	0	6	0	-40
Acer tararicum	0	19	2	1	1			0			1							1	0	9	0	+180
Acmena smithii	11	03	6		1			0		5	0			1	1	1	0			6	1	-40
Actinidia chinensis	4	37	7		1		7	1			0							7	0	8	0	-40
Aeonium arboreum	0	34	3		2			0									2				2	
Aesculus hippocastanum	0	07	8	1	1	1	4	0		7	1	6	0	6	0	2	1	4	0	2	1	-20
Agave americana *	22	24	0		2		7	0			0	9	1	4	1	1	2	6	1	5	2	+190
Ailanthus altissima *	0	07	2		2	3	7	0	1	5	0	6	0	8	0	4	2	7	2	8	2	+230
Akebia quinata	2	38	6		1		4	0			0	6	0	9	0			7	0	6	0	+30
Albizia distachya *	10	18	5	3	1		3	0	1		1	8	1	7	1	5	1	9	0	4	1	+130
Albizia julibrissin *	10	07	5	3	2	2	3	0		5	1							7	0	8	0	+340
Allamanda cathartica	0	37	0	0	0		1	0			0	10	0						1	5	0	-160
Alnus glutinosa *	0	07	1	2	2	1	3	0		2	1							2	2	6	2	+150
Aloe arborescens	22	24	0		2		1	0			1	3	1			2	1			7	1	+150
Aloe saponaria *	22	24	0		2		1	0			1	5	2			2	2			6	2	+150
Amelanchier canadensis	16	19	6		2	2	6	0	3	3	0					1	0	5	0	6	0	+270
Ampelopsis brevipenduncu.	0	39	6		1		4	0			1							7	0	7	0	+40
Angophora costata	11	03	1		1			0		4	0			1	0	1	1			7	0	-70
Annona cherimola	06	16	7		1		1	0		7	0	7	0							4	0	-150
Anredera cordifolia *	0	38	0		2		2	0			0	1	2	6	0					7	2	+230
Antigonon leptopus	0	38	0					0			0	5	0			8	0			8	0	+40
Araucaria araucana	0	1	2		1		3	0			0	5	0	2	0	2	0			3	0	-70

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Araucaria bidwillii	0	1	2		1	2		0		7	0	1	0	6	0	5	0			4	0	+30
Araucaria columnaris	0	1	2		1	3		0			0	7	0	10	0					2	0	-80
Araucaria cunninghamii	0	1	2		1	3		0		7	0	1	0	6	0	7	0			7	0	+60
Araujia sericifera *	0	38	1		0		2	0			0	1	2	6	2	7	2			6	2	+100
Arbutus andrachne	04	4	6	3	1		3	0			1	6	0	1	0					6	0	+150
Arbutus canariensis	04	4	6	3	1		3	0			1	9	0	10	0					3	0	-20
Arbutus menziesii	04	4	6	3	1		3	0		6	1							9	0	9	0	+80
Arbutus unedo	04	4	6	3	1	1	3	0			1			1	1	1	1	6	1	3	1	+120
Archontophoenix cunningh.	13	21	6		1		3	0			0	1	0	1	0	1	0			5	0	+40
Arctostaphylos uva-ursi	04	28	6	2	2		6	0		4	1							5	0	10	0	+280
Arecastrum romanzoffianum	13	21	6		1		4	0			0	1	0			5	0			7	0	+50
Aristolochia elegans *	0	38	1		2		1	0			0	1	0			7	0			6	0	+180
Artemisia abrotanum *	01	1	1		1		1	0			1			?	1	1	1			6	1	+130
Arundo donax *	0	1	1		2		7	0	3				1				2			2		
Asclepias fruticosa *	0	26	1		1		4	0			1	1	2			2	1			10	2	+150
Asclepias rotundifolia	0	26	1		1			0									2				2	
Asparagus aethiopicum	22	38	6		2			0			0	3	1							6	1	+40
Asparagus asparagoides *	22	38	6		2			0			1	1	2	5	2	2	2			8	2	+300
Asparagus densiflorus *	22	31	6		2		6	0			0	3	2	5	0	2	0	4	0	8	2	+180
Asparagus officinalis *	22	31	6		2		1	1			1	3	1	1	1	1	1	1	2	10	2	+310
Asparagus scandens	22	31	6		2		1	0			1	6	2	5	1					5	0	+150
Asparagus setaceus *	22	37	6		2			0			0	3	0	5	0	4	0	7	0	7	0	+60
Astartea fascicularis	11	27	4		1			0			1							6	0	2	0	-10
Aucuba japonica	04	28	6		1		3	0			0	6	0	9	0	9	0	7	0	8	0	-40
Azara microphylla	11	27	1		1			0			1			2	0			8	0	6	0	+20
Baeckea virgata	11	31	4		1		5	0			0							1	0	6	0	+40
Bambusa arundinacea	0	1	1		2		6	0	3		0	5	0							7	0	+130
Banksia collina	15	31	2		1			0			0			6	0					3	0	-70
Banksia ericifolia	15	20	2		1		3	0			0			6	0	4	0	2	0	2	0	-70
Banksia grandis	15	18	2		1			0			1					2	0			3	0	-100
Banksia integrifolia	15	18	2		1		3	0			0							2	0	7	0	-50
Banksia paludosa	15	27	2		1			0			0							5	0	3	0	-20
Banksia robur	15	27	2		1		3	0			0							2	0	6	0	-20
Banksia serrata	15	18	2		1		3	0			0							2	0	5	0	-60
Banksia spinulosa	15	20	2		1		3	0			0							1	0	7	0	+20
Bauera rubioides	0	27	4		1		4	0			1			1	0			2	0	4	0	+110
Bauhinia purpurea	0	16	4		1		3	0			0	6	0			3	0			8	0	-50
Bauhinia scandens	0	37	4		1			0			0	5	0							7	0	-90
Bauhinia variegata *	0	16	4		1	2	3	0			0	6	0			3	0			8	0	-60
Beaumontia grandifolia	0	37	1		1			0			0	8	0							7	0	-110
Berberis darwinii *	02	28	6	2	1		3	0		4	1	6	0	3	1	2	0	7	0	7	1	+50
Berberis dulcis	02	28	6	2	1			0			0					9	0			6	0	-80
Berberis thunbergii *	02	40	6	2	1		3	0		4	0			9	0	9	0	7	0	2	0	-140
Berberis vulgaris *	02	40	6	2	1		3	0		4	1	2	0	1	0	1	0			8	0	+120
Berberis wilsoniae	02	40	6	2	1			0			0			8	0	4	0			4	0	-130
Betula albo-sinensis	0	07	1	1	1			0		1	1							7	0	6	0	+40
Betula pendula *	0	07	1	1	1	2	3	0		1	0	5	0	1	0	1	0	4	0	9	0	+90
Bignonia capreolata	03	37	1		1		4	0			0							5	0	4	0	-130
Boronia denticulata	18	31	5		1		1	0			1							6	0	4	0	+50
Boronia heterophylla	18	31	5		1			0			1			4	0	2	0	9	0	2	0	-30
Boronia megastigma	18	31	5		1		1	0			0	7	0	4	0	2	0	9	0	2	0	-50
Bougainvillea glabra	0	26	1		1		4	0			0	1	0	6	0	7	0			7	0	+20
Bougainvillea spectabilis	0	26	1		1		6	0			0	7	0	6	0	7	0			6	0	-40
Bougainvillea Xbuttiana	0	26	1		1		4	0					1								1	
Brachychiton acerifolius *	0	1	4	3	1	1	4	0		6	0	1	1	6	0	5	0			6	1	+120
Brachysema lanceolata	07	32	0		1			0			1			4	0					5	0	+20
Brassaia actinophylla *	0	01	0				2	0			0	7	0			9	0	9	0	6	0	-40
Brugmansia arborea	21	16	0					0			0	7	0	6	0	7	0			4	0	-90
Brugmansia suaveolens	21	16	0					0			0	1	0							6	0	+20
Brunfelsia americana	21	16	0		1		2	0			0	9	0							4	0	-170
Brunfelsia uniflora	21	26	0		1			0			0	8	0							6	0	-50
Buddleia crispa	0	40	1		1		4	0		1	0	8	0	10	0					7	0	-140
Buddleia davidii *	0	40	1		1		7	0		1	1	6	0	10	0	8	1	7	1	5	1	-60
Buddleia globosa	0	40	1		1		4	0		1	1	6	0	2	0	2	0	8	0	7	0	-80
Buddleia lindleyana *	0	40	1		1		4	0		1	0	6	0	10	0			7	0	7	0	-170
Buddleia madagascariensis	0	40	1		2		4	0		1	0	7	1			9	2			5	2	-50
Buddleia salvifolia	0	26	1		2	3	4	0		1	1					4	0			8	0	+180
Burchellia bubalina	17	27	0		1	1	4	0			1	3	0							7	0	+50
Buxus sempervirens *	0	27	5		1		3	0		6	1	5	0	1	0	1	0	4	0	6	0	+220

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Caesalpinia gilliesii *	0	16	4	3	1	2	2	0			0	1	0	6	0	4	0			7	0	+180
Calliandra tweedii	10	26	0		1			0			0	1	0							5	0	+100
Callistemon citrinus	11	18	4	2	1	1	2	0			0			2	1	2	0	1	2	6	2	-20
Callistemon phoeniceus	11	27	4	2	1		2	0			1					1	1	6	0	5	1	+60
Callistemon rigidus	11	31	4	2	1	1	5	0			0			6	0			2	0	3	0	-130
Callistemon salignus	11	20	4	2	1	2	2	0			0			4	0			2	0	5	0	-160
Callistemon speciosus	11	18	4	2	1		2	0			1							9	0	4	0	-120
Callistemon viminalis	11	20	4	2	1	2	5	0			0					2	0	2	0	7	0	-120
Callitris rhomboidea	05	20	2		1			0			0			1	0			2	0	6	0	+30
Calluna vulgaris *	04	31	1		1		1	0	2		1			1	0	1	0	2	0	9	0	+170
Calocedrus decurrens	05	09	1		1		2	0			1							6	0	6	0	-40
Calocephalus brownii	01	31	0		1			0			1							2	0	5	0	+30
Calodendrum capense	18	4	4		1	1	6	0			1	3	0	6	0					6	0	+70
Calothamnus affinis	11	31	4		1			0			1					1	1			1		+50
Calothamnus quadrifidus	11	31	4		1			0			1					6	1			6	1	-50
Calothamnus rupestris	11	31	4		1			0			1					1	1			3	1	+30
Calothamnus villosus	11	31	4		1		2	0			1									5	0	
Calycanthus floridus	04	40	0		2		4	0			0	3	0	3	0	3	0	6	0	4	0	-30
Camellia japonica	0	28	4		1		4	0			0	3	0	9	0	9	0	9	0	6	0	-30
Camellia reticulata	0	28	4		1		7	0			0							8	0	4	0	0
Camellia sasanqua	0	28	4		1		7	0			0	5	0	7	0	10	0	7	0	4	0	-30
Camellia sinensis	0	28	4		1		6	0			0	6	0	8	0	4	0			6	0	-20
Campsis grandiflora	03	37	1	1	1			0			0	6	0	10	0	10	0	7	0	6	0	-110
Campsis radicans	03	37	1	1	1		1	0		2	0	1	0	3	0	3	0			0		-20
Cantua buxifolia	0	28	0		1			0			0	7	0	6	0	7	0			4	0	-90
Cardiospermum grandiflor.	*0	39	3		2		2	0					2								2	
Carpinus betulus	0	07	2		1		6	0	3	3	1							2	0	6	0	+90
Carya illinoinensis	0	07	8	3	1	1	4	0	3	7	0	3	0					2	0	7	0	-90
Cassia bicapsularis *	0	26	4	3	1	2	3	0			0	1	1	6	0	5	0			10	2	+70
Cassia floribunda *	0	26	4	3	1	2	3	0			0	1	1	5	0	1	0			10	2	+70
Castanea crenata	08	07	8		1		2	0		7	0	6	0	1	0					5	0	+30
Castanea sativa *	08	07	8	1	1	1	2	0		7	1	2	0					1	0	7	0	+110
Castanospermum australe	07	01	3		1	1		0			0	3	0	8	0	9	0			6	0	+80
Casuarina glauca	0	1	1		2	3	1	0			0					2	1			4	1	+140
Casuarina torulosa	0	1	1		1		2	1			0							4	0	6	0	-20
Catalpa bignonioides *	03	07	1	1	1	2	4	0		5	0	3	0	3	0	3	0	6	0	2	0	0
Catalpa speciosa *	03	07	1	1	1	3	4	0	3	4	0					9	0	8	0	2	0	-60
Ceanothus papillosus	0	27	4	3	1			0		4	1							9	0	3	0	+20
Cedrus atlantica	14	10	2	1	1			0	3	5	1	8	0	7	0	4	0	7	0	4	0	+40
Cedrus deodara	14	10	2	1	1	2		0	3	5	0	7	0	6	0	7	0	9	0	6	0	-40
Celastrus scandens	0	19	6	3	2		5	1			0							5	0	7	0	+110
Celtis australis *	0	07	6	3	1	1	4	0		6	1	2	0			1	0	1	2	9	2	+240
Celtis occidentalis *	0	07	6	3	1	2	3	0		6	0	3	1					2	0	5	1	+10
Ceratonia siliqua *	0	18	6		1	1	2	0			1	5	0	2	0	1	0			6	0	+130
Ceratophyllum willmottian.	0	40	0		1			0			0					8	0	7	0	5	0	-160
Cercis siliquastrum *	0	07	7		1	2	1	0	2	5	1	6	0	1	0	1	0	2	0	4	0	+130
Cestrum aurantiacum *	21	16	6	3			1	0			0	7	0	9	0	8	0			5	0	-70
Cestrum diurnum *	21	16	6	3			1	0			0	8	0	10	0					6	0	-70
Cestrum elegans *	21	37	6	3			1	0			0	1	0	1	2	8	1			6	1	+40
Cestrum nocturnum	21	26	6	3			1	0			0	5	0							8	0	+30
Cestrum parqui	21	26	6	3	2		1	0	2				1								1	
Chaenomeles japonica	16	40	7		1		4	0			0	7	0	6	0			7	0	5	0	-130
Chaenomeles speciosa	16	40	7		1		4	0			0			3	0			6	0	6	0	-100
Chamaecyparis funebris	05	12	1	1	1			0		1	0	6	0	8	0	4	0	7	0	7	0	-100
Chamaecyparis lawsoniana	*05	09	1	1	1	1				1	1	7	0	6	0	7	0	9	0	2	0	-90
Chamaecyparis nootkatens.	05	09	1	1	1					1	1							9	0	3	0	-100
Chamaecyparis obtusa	05	09	1	1	1		2			1	0	6	0	5	0	9	0	7	0	4	0	-130
Chamaecyparis pisifera	05	09	1	1	1			0	2	1	0	6	0	9	0	9	0	5	0	4	0	-120
Chamaecyparis thyoides	05	12	1	1	1			0	2	1	0							7	0	3	0	-120
Chamaecytisus prolifer *	07	27	4	3	1			0		5	1	9	0	10	2	7	2	10	2	4	2	+160
Chamaerops humilis	13	21	0				4	0			0	5	0	5	0	1	0			6	0	+40
Chamelaucium uncinatum	11	31	0		1		2	0			1			9	0	4	0			3	0	-80
Chimonanthus praecox	06	40	6		1		4	0			0	6	0	10	0	8	0	7	0	7	0	-120
Chimonobambusa falcata	0	1	1		2			0			0	8	0							6	0	+110
Choisya ternata	18	28	0		1			0			0	5	0	8	0	8	0	6	0	5	0	-60
Chorizema cordatum	07	27	0		1			0			1	5	0	4	0	1	0	6	0	2	0	+200
Chrysanthemoides monilif	*01	27	6	2	1		4	0	1		1	3	2	5	3	2	2			7	2	+100
Chrysanthemum frutescens	01	32	1		1		3	0			1	9	0							3	0	-80
Cinnamomum camphora *	06	01	6		2	1	2	0			0	6	2	9	0	8	1	7	0	7	2	+60
Cissus antarctica	0	37	6		1			0			0					4	0	1	0	7	0	+30
Cissus discolor	0	37	6		1		2	0			0	10	0							1	6	0 -130

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Cistus ladanifer	0	27	0		1		1	0			1			1	0			4	0	6	0	+150
Cistus salviifolius	0	27	0		1		1	0			1							6	0	6	0	+30
Citrus aurantiifolia *	18	16	7	1	2		3	0			0	6	0	3	0	3	0			6	0	-10
Citrus aurantium *	18	16	7	1	2		1	0			0	6	0	3	0	3	0			6	0	-10
Citrus jambhiri *	18	16	7	1	2			0			0	7	1							5	1	-20
Citrus limon	18	16	7	1	2		4	0			0	6	0	3	0	3	0			6	0	-10
Citrus maxima	18	16	7	1	2		4	0			0	9	0	10	0					2	0	-110
Citrus medica	18	16	7	1	2		1	0			0	6	0			3	0			6	0	-10
Citrus reticulata *	18	16	7	1	2		4	0	2		0	6	0	3	0	3	0			6	0	-10
Citrus sinensis *	18	16	7	1	2		4	0	2		0	6	0	3	0	3	0			7	0	-10
Clematis montana	2	39	1		1		1	0			0	6	0	9	0	9	0	7	0	8	0	-30
Clerodendrum thomsoniae	0	26	7				6	0			0	9	0							6	0	-80
Clethra arborea	2	18	0		1		1	0			1	10	0	9	0	7	0			2	0	-10
Clianthus puniceus	07	28	0		1		4	0			0	5	0	4	0	4	0			3	0	0
Clytostoma callistegioid.	03	37	1					0			0	1	1	6	0	5	0			6	1	+40
Cobaea scandens *	0	37	0					0			0	5	0	8	0	8	0			7	0	-70
Coffea arabica *	04	26	7	1	1		7	0	2		0	6	0							6	0	-80
Coleonema album	18	31	4		1			0			1			5	0	4	1	7	0	6	1	+30
Coleonema compacta	18	31	4		1			0			1							4	0	4	0	+20
Coleonema pulchrum	18	31	4		1			0			1							4	0	5	0	+20
Convolvulus mauritanicus	0	39	0		1			0			1										0	
Coprosma lucida	04	28	6		1		5	0			0	5	0	1		1	0			5	0	+60
Coprosma repens *	04	28	6		1	1		1			0	5	2	1	2	1	1			5	2	+50
Cordyline australis	22	24	6		2		4	0			0	5	0	1	0			6	0	5	0	+180
Cordyline terminalis	22	24	6		2		7	0			0	5	0	9	1			9	0	7	1	+90
Cornus capitata	04	04	6		1		2	0			0			8	0			7	0	8	0	+20
Cornus florida	04	04	6		2	2	2	0		5	0							2	0	6	0	+120
Cornus sericea *	04	40	6		1			0			0									4	0	-130
Corokia cotoneaster	04	28	6		1		1	0			0							6	0	5	0	-50
Coronilla valentina	07	27	0		1		2	0			1	5	0	2	0	1	0			6	0	+230
Correa alba	18	27	0		1		3	0			1							6	0	5	0	-40
Correa glabra	18	27	0		1			0			1							1	0	7	0	+160
Cortaderia selloana *	0	1	1	1	2		6	1			1	1	2	6	2	4	1	1	2	6	2	+320
Corylopsis spicata	0	40	0		1			0			0							7	0	2	0	-180
Corylus avellana	0	19	8		2		2	0	3	7	1	5	0	1	0	1	0	2	0	9	0	+250
Corynocarpus laevigata *	0	04	6		1	1	5	0			0	5	0			1	0			5	0	+100
Cotinus coggygria	0	40	1		1		4	0			0	6	0	3	0	2	0	4	0	9	0	-110
Cotoneaster buxifolius	16	28	6	2	2			0		4	1	6	0			4	0	7	0	5	0	+250
Cotoneaster dammeri	16	28	6	2	2		3	0		4	1							7	0	5	0	+240
Cotoneaster franchetii	16	28	6	2	2	2	6	0		4	1			3	0			6	1	5	1	+290
Cotoneaster glaucophyllu*	16	28	6	2	2		6	0		4	1	7	2	8	2	4	1	7	2	5	2	+250
Cotoneaster horizontalis	16	33	6	2	2		6	0		3	0			3	0			6	1	6	1	+150
Cotoneaster lacteus	16	28	6	2	2	2		0		4	1							7	0	5	0	+210
Cotoneaster microphyllus	16	33	6	2	2		6	0		4	0	6	0	3	0	3	0	6	0	6	0	+190
Cotoneaster pannosus *	16	28	6	2	2	3	1	0		4	1	7	1	8	2	4	1	7	2	5	2	+260
Cotoneaster rotundifolius	16	28	6	2	2		6	0		4	0			3	0			6	1	6	1	+190
Cotoneaster simonsii *	16	28	6	2	2		6	0		4	0	6	0	3	2	3	1	7	2	5	2	+180
Cotyledon orbiculata	0	34	3		2		6	0			1	1	1			2	1			8	1	+320
Crassula tetragona	0	34	0		2		5	0			1			5	1					5	1	+140
Crataegus crus-galli	16	19	6	2		1	5	0		5	0							5	1	6	1	+110
Crataegus laevigata	16	19	6	2		2	4	0		5	0	2	0	1	0	1	0	1	1	7	1	+180
Crataegus monogyna *	16	19	6	2	2		5	0	2	5	1	5	0	1	2	1	2	2	2	9	2	+420
Crataegus phaenopyrum	16	19	6	2	2	1		0			0			3	0	3	0	5	1	4	1	+150
Crataegus sinaica	16	19	6	2				0									1				1	
Crataegus uniflora	16	40	6	2			5	0			1							5	0	5	0	+40
Crataegus Xprunifolia	16	19	6	2				0													1	
Crotalaria semperflorens	07	16	0	3	1			0					1								1	
Cryptomeria japonica *	0	09	1		1	3		0			0	6	0	8	0	4	0	7	0	7	0	-70
Cuphea ignea	0	33	0		1			0			0	5	0	9	0	8	0			6	0	-60
Cuphea jorullensis	0	33	0		1		4	0			0	5	0	8	0	8	0			7	0	-60
Cupressus arizonica	05	10	1	2	1			0		4	0	10	0	3	0	7	0	2	0	3	1	-80
Cupressus goveniana	05	10	1	2	1	2		0			1			6	0	7	1	9	0	2	1	-70
Cupressus lusitanica	05	10	1	2	1	3		0			1	7	0	8	0	8	0	6	0	6	0	-10
Cupressus macrocarpa *	05	10	1	2	1	3		0		3	1			9	1	7	0	10	0	2	1	-50
Cupressus sempervirens	05	10	1	2	1	2		0			1	5	0	9	0	4	0	8	0	7	0	-30
Cupressus torulosa	05	10	1	2	1	3		0	3	3	0	6	0	8	0	4	0	7	0	7	0	-20
Cycas revoluta	0	21	3		2		2	1			0	6	0							2	0	+20
Cydonia oblonga *	16	40	7		2		4	0			1	6	0	2	0	2	1	2	1	6	1	+90
Cyperus alternifolius *	0	1	1		2		7	0			0	7	1	9	0	9	0			6	1	+140

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Cyphomandra betacea	21	26	6		1		2	0			0	7	0			7	0			4	0	-50
Cytisus scoparius *	07	27	5	3	1		5	0	1	4	1	2	0	1	2	1	2	1	1	7	2	+380
Daboecia cantabrica	04	27	1		1		2	0			1			1	0	1	0	6	0	7	0	+110
Dampiera cuneata	0	31	0		2		5	0								1				1		
Daphne odora	0	28	0	1	1		4	0			0	6	0	10	0	8	0	7	0	5	0	-70
Darwinia citriodora	11	27	0		1		1	0			1					2	1			4	1	-30
Deutzia crenata	04	40	1		1		7	0			0	6	0	9	0	9	0	7	0	5	0	-160
Deutzia gracilis	04	40	1		1		3	0			0	6	0	10	0	10	0			2	0	-230
Deutzia scabra *	04	40	1		1		7	0			0	6	0	10	0	10	0			2	0	-190
Diosma ericoides	18	31	1		1			0			1	1	0	3	1	4	0			7	1	+110
Diospyros kaki	0	01	7		1	1	6	0			0	6	0	9	0	8	0	7	0	8	0	-10
Dipogon lignosus *	07	39	4	3	1		2	0					1		2		1				2	
Dodonaea viscosa	0	27	3		1	2	4	1							1						1	
Dombeya burgessiae	0	26	0		1	3		0			0	3	0							5	0	-40
Dombeya tiliacea	0	16	0		1			0			0	1	0	5	0					4	0	-10
Dracaena draco	22	24	6		1		4	0			1	9	0	10	0					3	0	-30
Dracaena fragrans	22	24	6		1		5	0			0	3	0	5	0					7	0	+10
Dryandra praemorsa	15	31	0		1			0			1					6	1			3	1	+20
Duranta repens *	0	26	6		1	2	1	0			0	1	0			4	0			9	0	+100
Elaeagnus pungens	0	28	6	2	1		3	0		5	0							9	0	7	0	-60
Ensete ventricosum	0	21	7		2			0			0	6	0			8	0			5	0	+20
Epacris longiflora	4	31	4		1		3	0			0			3	0			1	0	5	0	+30
Erica arborea *	04	1	1		1		2	0	2	1	1			4	1	4	2			3	2	+30
Erica baccans	04	27	1		1			0	2	1	1			1	0	1	0			9	0	+190
Erica bauera	04	27	1		1			0	2	1	0	6	0	5	0	2	0			2	0	-70
Erica carnea	04	32	1	1	1		2	0	2	1	1							2	0	5	0	-10
Erica cerinthoides	04	32	1		1			0	2	1	1			5	0	2	0			6	0	+10
Erica cruenta	04	32	1		1			0	2	1	0			5	0	4	0			3	0	-100
Erica lusitanica *	04	31	1		1			0	2	1	1	5	1	1	2	1	2			6	2	+110
Erica mammosa	04	31	1		1			0	2	1	1			5	0	4	0			4	0	-10
Erica mediterranea	04	31	1		1			0	2	1	1							6	0	4	0	0
Erica melanthera	04	32	1		1			0	2	1	1			6	0	4	0	7	0	5	0	-10
Erica ventricosa	04	31	1		1			0	2	1	0			4	0	4	0			3	0	-90
Eriobotrya japonica *	16	16	6		1	2	4	0			0	6	1	9	1	5	0	7	0	7	1	-30
Eriostemon myoporoides	18	27	4		1		3	0			0			1	0	1	0	1	0	6	0	+70
Erythrina caffra	07	19	3	3	1	3		0			0	1	0		0					3	0	+140
Erythrina crista-galli	07	19	3	3	1	1	5	0			0	1	0	6	0	5	0			6	0	+170
Erythrina lysistemon	07	19	3	3	1	2	5	0			0	1	1							6	1	+170
Erythrina Xskeysii	07	19	3	3	1			0					2							1		
Escallonia bifida	04	28	0		1			0			0	1	0	6	0	5	0	2	0	6	0	+30
Escallonia rubida	04	28	0		1		2	0			1	6	0			2	0	8	0	7	0	+10
Eucalyptus aggregata	11	03	1	2	1		2	0	3	2	0							6	0	4	0	-240
Eucalyptus albens	11	03	2	2	1	3	2	0	3	3	0							2	0	6	0	-160
Eucalyptus angophoroides	11	03	1	2	1			0	3	2	0							2	0	5	0	-210
Eucalyptus argophloia	11	03	1	2	1			0	3	2	0							2	0	2	0	-250
Eucalyptus botryoides *	11	03	2	2	1	3	2	0	3	2	0			1	1			2	0	5	1	-100
Eucalyptus caesia	11	18	2	2	1	1		0	3	4	1			7	0	1	0			4	0	+50
Eucalyptus calophylla	11	03	2	2	1	3	2	0	3	6	0	5	0	4	0	1	0				0	-210
Eucalyptus camaldulensis	11	03	1	2	1	3	2	0	3	2	1							1	0	9	0	-10
Eucalyptus citriodora	11	03	1	2	1	3	3	0	3	2	0	3	1	8	0	7	0			6	1	-210
Eucalyptus cladocalyx *	11	03	2	2	1	3	2	0	3	4	1	5	0	1	0	1	0			5	0	0
Eucalyptus coccifera	11	18	2	2	1			0	3	4	0							6	0	4	0	-120
Eucalyptus cornuta *	11	03	2	2	1	3	2	0	3	4	1			4	0	1	0			3	0	-10
Eucalyptus crenulata	11	03	1	2	1			0	3	1	1							6	0	4	0	-150
Eucalyptus elata *	11	03	2	2	1	3		0	3	3	0							2	0	5	0	-210
Eucalyptus erythronema	11	18	2	2	1		2	0	3	3	1									5	0	
Eucalyptus ficifolia	11	18	2	2	1	2	2	0	3	5	1	7	0	5	0	2	1			2	1	-80
Eucalyptus forrestiana	11	18	2	2	1	1	2	0	3	5	1									3	0	
Eucalyptus fraxinoides	11	03	2	2	1	3		0	3	4	0							5	0	3	0	-180
Eucalyptus glaucescens	11	18	2	2	1			0	3	4	0							1	0	4	0	-20
Eucalyptus globulus *	11	03	2	2	1	3	3	0	3	4	0	1				1	1	1	1	6	1	-60
Eucalyptus gomphocephala	11	03	2	2	1	3	2	0	3	5	1			4	0	1	0			2	0	-20
Eucalyptus gregsoniana	11	18	2	2	1			0	3	3	0							1	0		0	-80
Eucalyptus gunnii *	11	03	2	2	1		2	0	3	3	0							6	0	3	0	-230
Eucalyptus lehmannii *	11	18	2	2	2	2	2	0	3	5	1			4	0	4	0			3	0	-10
Eucalyptus leucoxylon	11	03	2	2	1	3	2	0	3	3	1							2	0	4	0	-90
Eucalyptus macarthurii *	11	03	2	2	1	3	2	0	3	3	0							2	0	6	0	-160
Eucalyptus maculata *	11	03	2	2	1	3	2	0	3	4	0			4	0	1	0			6	0	+30
Eucalyptus maidenii *	11	03	2	2	1	3	2	0	3	5	0							6	0	3	0	-190

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Eucalyptus marginata	11	03	2	2	1	1		0	3	2	1					1	0			3	0	-50
Eucalyptus moorei	11	18	1	2	1			0	3	3	0							2	0	4	0	-220
Eucalyptus nicholii	11	03	2	2	1			0	3	4	0							1	0	5	0	-80
Eucalyptus oblicua *	11	03	2	1	1	3	2	0	3	2	1							1	0	7	0	-20
Eucalyptus ovata	11	03	2	2	1		2	0	3	2	1							2	0	2	0	-160
Eucalyptus paniculata *	11	03	1	2	1	3	2	0	3	2	0							2	0	7	0	-200
Eucalyptus parvifolia	11	18	1	2	1			0	3		0							6	0	5	0	-170
Eucalyptus pilularis	11	03	2	2	1	3		0	3	5	0			3	0	1	0			5	0	+40
Eucalyptus preissiana	11	18	2	2	1			0	3	4	1									4	0	-30
Eucalyptus pulchella	11	03	2	2	1			0	3	4	0							6	0	2	0	-210
Eucalyptus pulverulenta	11	18	2	2	1		2	0	3	2	0							2	0	4	0	-150
Eucalyptus regnans	11	1	2	2	1			0	3	3	0							5	0	3	0	-160
Eucalyptus risdonii	11	18	2	2	1			0	3	3	0							6	0	5	0	-140
Eucalyptus robusta	11	03	2	2	1	3		0	3	4	0			1	0	1	0			5	0	-50
Eucalyptus rodwayi	11	03	1	2	1			0	3	2	0							6	0	2	0	-250
Eucalyptus saligna *	11	1	1	2	1	3	2	0	3	2	0			1	1			1	0	4	1	-70
Eucalyptus scoparia	11	03	1	2	1			0	3	2	0							2	0	7	0	-210
Eucalyptus sideroxylon *	11	03	2	2	1	1	2	0	3	3	0							1	0	4	0	-130
Eucalyptus sieberi	11	03	1	2	1	3		0	3	2	0			1	1			1	0	8	1	-60
Eucalyptus spathulata	11	18	2	2	1			0	3	3	1									5	0	-60
Eucalyptus stricklandii	11	03	2	2	1			0	3	4	0					4	0	7	0	6	0	-170
Eucalyptus tereticornis *	11	03	1	2	1	3	2	0	3	2	0							1	0	3	0	-40
Eucalyptus torquata	11	18	1	2	1	2	2	0	3	2	0			6	0	2	0			3	0	-210
Eucalyptus youmanii	11	03	2	2	1			0	3	5	0							1	0	6	0	-70
Euonymus fortunei	0	28	6	2	1		4	0		5	0	6	0	9	0			7	0	6	0	-10
Euonymus japonicum *	0	28	6	2	1	1	4	0		5	0	6	0	9	0	9	0	7	0	6	0	-20
Eupatorium sordidum	01	26	0				1	0			0	5	0			9	0			6	0	-40
Euphorbia fulgens	0	34	0				3	0			0	6	0							5	0	-60
Euphorbia pulcherrima *	0	26	0				3	0			0	5	0	8	0	8	0			7	0	-10
Euphorbia splendens	0	26	0				2	0			0	7	0	9	0					6	0	-40
Euryops abrotanifolius	01	31	1		1		2	0						5	1					2	1	-90
Exochorda racemosa	16	40	1		1			0			0							7	0	5	0	-100
Fagus sylvatica *	08	07	8	1	1	1	2	0	3	6	1			1	0	1	0	2		7	0	+130
Fatsia japonica *	0	18	6		1		5	0			0	6	0	10	0	10	0	7	0	4	0	-10
Feijoa sellowiana	11	26	7		1		2	0			0	1	0	6	0	5	0	2	0	7	0	-70
Felicia amelloides	01	27	1		1		1	0			1	3	0	3	0	4	0	7	0	3	0	+20
Ficus benjamina	0	16	7				3	0			0	5	0			3	0	6	0	7		-110
Ficus carica *	0	19	7		2		3	1	3						1	1	2	2	0		2	+140
Ficus elastica	0	01	7		1	2	3	0			0	5	1	10	1	10	0	10	0	4	1	-100
Ficus macrophylla	0	01	7		1	3	3	0			0			6	0	5	0	2	0	3	0	-80
Ficus pumila	0	37	7		2		3	0				5	1	9	1	9	0	7	0		1	+30
Firmiana simplex	0	07	4		1	2	4	0			0							7	0	6	0	-40
Forsythia suspensa	12	40	1		1		3	0			0			8	0			7	0	8	0	-90
Forsythia viridissima	12	40	1		1		3	0			0	5	0	10	0	10	0	8	0	3	0	-160
Fortunella margarita	18	16	6		1			0			1							9	0	3	0	-70
Fraxinus americana *	12	07	2	1	1	2	7	1	3	5	1			2	1	3	0	2	0	7	0	+140
Fraxinus excelsior *	12	07	2	2	1		5	0	3	5	1	2	0	1	1	1	0	1	2	8	2	+280
Fraxinus ornus *	12	07	2	1	1	2	5		3	5	1			1	0	1	0	1	0	7	2	+220
Fraxinus oxycarpa	12	07	2	1	1	2	5	1			1			2	0	1	2	1	1	8	2	+260
Fraxinus pennsylvanica *	12	07	2	1	2	3	5	0		5	1							2	0	7	0	+290
Fraxinus velutina *	12	07	2	1	1	1	5	1		4	0							8	0	5	0	+50
Fuchsia magellanica *	0	28	6		2		5	0		4							2			2		
Gardenia jasminoides	04	28	7		1		2	0			0	1	0	4	0	4	0	2	0	7	0	+10
Gardenia thunbergia	04	28	7		1	1	2	0			0	1	0	5	0	4	0			4	0	-10
Garrya elliptica	04	18	0		1		2	1			1			6	0	7	0	9	0	3	0	0
Gelsemium sempervirens *	0	38	1				1	0			0	1	0	3	0	3	0	5	0	7	0	+110
Genista linifolia	07	27	5	3	1		5	0	1		1	5	2	1	1	1	2			6	2	+330
Genista maderensis	07	27	5	3	1		5	0	1								1			1		
Genista monspessulana *	07	27	5	3	1		5	0	1		1	2	2	2	2	1	3	1	1	6	2	+350
Ginkgo biloba	0	07	7		1	1	2	1			0	6	0	8	0	4	0	7	0	8	0	-20
Gleditsia sinensis	7	07	3	3	2		3	0			0	6	0			8	0			7	0	+190
Gleditsia triacanthos *	07	07	3	3	2	3	3	0	2	6	1	2	2	3	0			2	0	5	2	+310
Graptophyllum excelsum	0	27		0	0		0				0	7	0							6	0	0
Grevillea aquifolium	15	27	4	0	1		0				1					1	1			3	1	+140
Grevillea banksii *	15	18	4	0	1	3	1	0			0	3	0			8	0			6	0	-40
Grevillea baueri	15	27	4	0	1			0			0							1	0	5	0	+70
Grevillea biternata	15	31	4	0	1			0			1					1	1	6	0	4	1	+120
Grevillea glabella	15	31	4	0	1			0			1							4	0	4	0	+20
Grevillea hilliana	15	02	4	0	1	1		0			0	1	0	2	0					7	0	+100

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Grevillea laurifolia	15	31	4	0	1		1	0			1											
Grevillea lavandulacea	15	31	4	0	1		1	0			1							7	0	2	0	-20
Grevillea longifolia	15	31	4	0	1			0			1							4	0	5	0	+10
Grevillea obtusiflora	15	27	4	0	1		1	0			0							2	0	4	0	+30
Grevillea robusta *	15	02	4	0	1	3	1	0				1	1	4	1	4	0	5	0	2	0	-60
Grevillea rosmarinifolia	15	31	4	0	1		1	0			0			1	0	1	1	2	2	4	2	+30
Grevillea trifida	15	27	4	0	1			0									1				1	
Grevillea XCanberra gem	15	31	4	0	1			0											1		1	
Hakea bipinnatifida	15	27	2	0	1			0									1				1	
Hakea cristata	15	27	2	0	1			0			1					6	1			2	1	-20
Hakea eriantha	15	20	2	0	1			0			0							2	1	5	1	-70
Hakea laurina	15	18	2	0	1			0			1	5	0	4	0	1	2	6	0	3	2	+110
Hakea orthorrhyncha	15	20	2	0	1			0			1						1			2	1	
Hakea salicifolia *	15	20	2	1	1			0			0			1	1	1	1	1	0	5	1	+20
Hakea sericea *	15	20	2	0	1		1	0	2	6	1					1	1			5	1	+100
Hakea suaveolens *	15	31	2	2	1			0	3		1			4	0	1	0			2	0	+8
Hakea teretifolia	15	31	2	0	1			0			1					4	0	2	0	5	0	+10
Hardenbergia comptoniana	07	38	5	3	1			0			1			5	0	2	0			3	0	+210
Hebe buxifolia	0	28	0	0	1		7	0			0			1	0	1	0	6	0	5	0	+70
Hebe decumbens	0	28	0	0	1		4	0			0							6	0	3	0	-80
Hebe glaucophylla	0	33	0	0	1		7	0			0							6	0	3	0	-50
Hebe gracillima	0	28	0	0	1		7	0			0	5	0							4	0	-30
Hebe hulkeana	0	28	0	0	1		5	0			0	5	0	1	0	1	0	6	0	3	0	+60
Hebe parviflora	0	20	0	0	1		7	0									1				1	
Hebe speciosa *	0	28	0	0	1		4	0			0	5	0	1	0	6	0	9	0	4	0	+30
Hedera canariensis	0	38	6	0	2		7	0			1			4	0	1	0	6	0	7	0	+350
Hedera helix *	0	38	6	0	2		7	0		6	1	-	2	1	2	1	1	1	2	9	2	+430
Hedychium coronarium *	0	1	0	0	2		6	0			0	6	2							7	2	+120
Hedyscepe canterburyana	13	21	7	0	1			0			0	5	0							2	0	-130
Hibiscus grandiflorus	0	16	0	3	1		4	0			0	3	0			9	0			4	0	-110
Hibiscus mutabilis *	0	16	0	3	1		7	0			0					4	0			6	0	-70
Hibiscus rosa-sinensis	0	16	0	3	1	2	7	0			0	7	0			10	0			7	0	-80
Hibiscus syriacus *	0	26	1	3	1	2	7	0			0	6	0	8	0	4	0	7	0	6	0	-50
Hovenia dulcis	0	07	4	0	1	1	2	0			0	6	0							8	0	+10
Howea belmoreana	13	21	6	0	1		4	0			0	5	0	9	0	10	0			2	0	-90
Howea forsterana	13	21	6	0	1		4	0			0	5	0	9	0	10	0			2	0	-90
Hoya bella	0	33	0	0	0			0			0	7	0	6	0	7	0			6	0	-40
Hoya carnosa	0	34	0	0	0		2	0			0	5	0	2	0	2	0	6	0	7	0	-30
Hydrangea macrophylla *	04	40	0	0	1			0			0	6	0	9	0	9	0	7	0	5	0	-200
Hydrangea paniculata	04	40	0	0	1		6	0			0	6	0	9	0	9	0	7	0	6	0	-170
Hydrangea quercifolia *	04	40	0	0	1		4	0			0				0			5	0	3	0	-190
Hypericum androsaemum *	0	27	6	0	1		4	0		1	0				2						2	
Hypericum calycinum *	0	32	6	0	1		1	0			1			1	0			6	0	3	0	+90
Hypericum patulum	0	26	6	0	1		4	0			0			7	0	10	0	7	0	6	0	-40
Hypericum reptans	0	33	6	0	1			0			0							6	0	6	0	-10
Ilex aquifolium *	04	28	6	0	1	1	5	1	2	4	0	5	0	1	2	1	2	2	0	8	2	+170
Illicium anisatum	06	18	4	0	1		3	0			0	6	0	10	0					6	0	-60
Indigofera incarnata	07	33	5	3	2		5	0			0	6	1	9	0	8	0	7	0	6	1	+210
Ipomoea acuminata *	0	38	4	3	2		4	0			0	1	2	5	0	4	0			10	2	+210
Ipomoea purpurea *	0	39	4	3	2		4	0			0	1	2	5	0	4	0			10	2	+210
Ixora coccinea	04	26	0	0	0		2	0			0	6	0							7	0	-40
Jacaranda mimosifolia *	03	19	1	0	1	3	6	0			0	8	2	9	0	8	0			4	2	-40
Jasminum fruticans *	12	27	6	0	1		3	0			1	2	0	1	0	1	0			6	0	+200
Jasminum grandiflorum	12	38	6	0	1		3	0			0	7	0	10	0	10	0			6	0	+60
Jasminum humile *	12	18	6	0	1		3	0			1	7	0	8	0	4	0			7	0	+70
Jasminum mesnyi	12	28	6	0	0		3	0			1	6	1	6	0	2	0	4	0	6	1	+80
Jasminum nudiflorum *	12	38	6	0	1		6	0			1			10	0	10	0	9	0	4	0	+120
Jasminum officinale *	12	38	6	0	1		3	0			1	7	0	8	0	4	0			7	0	+140
Jasminum polyanthum	12	38	6	0	1			0			1	7	1					7	0	5	1	+140
Jasminum volubile	12	37	6	0	1		3	0			0	1	0	4	0	4	0			7	0	+40
Juglans ailantifolia	0	07	8	2	1			0			0	6	0					7	0	5	0	-60
Juglans microcarpa *	0	19	8	2	1	2		0		7	0							2	0	5	0	-60
Juglans nigra *	0	07	8	2	1	1	4	0	3	7	0					7	0	2	0	5	0	-20
Juglans regia *	0	07	8	2	1	1	4	0	2	7	0	6	0	1	0	1	0	4	0	9	0	+80
Juniperus bermudiana	05	12	6	2	1			1			0	9	0	10	0	10	0			2	0	-150
Juniperus chinensis	05	12	6	2	1		4	1				6	0	9	0	1	0	7	1	8	1	+60
Juniperus communis	05	20	6	2	2			1		4	1	5	0	1	0	1	0	2	0	8	0	+300
Juniperus conferta	05	32	6	2	1			1			0	4	0					7	0	6	0	-70
Juniperus horizontalis	05	32	6	2	1		2	1			0							9	0	6	0	-130
Juniperus oxycedrus	05	20	6	2	1		2	1			1	1	0	1	0					8	0	+140

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Juniperus sabina	05	31	6	2	1		2	1			1			1	0	1	0	2	0	9	0	+160
Juniperus virginiana	05	12	6	2	1	1	2	1	3	4	1			2	0	9	0	2	0	6	0	-60
Justicia rizzinii	0	32	0	0	0			0			0	1	0	1	0	1	0			7	0	+60
Kalanchoe pinnata *	0	34	0	0	2		4	0					2								2	
Kalmia angustifolia *	04	28	0	0	1		2	0			0							5	0	6	0	-50
Kalmia latifolia	04	28	4	0	1		2	0			0			3	0			5	0	5	0	-60
Kennedia nigricans	07	38	5	3	1			0			1			4	0	1	1	6	0	4	1	+430
Kennedia rubicunda	07	38	5	3	1			0							1						1	
Kerria japonica *	16	40	0	0	0		1	0			0	6	0	9	0	9	0	7	0	5	0	-60
Koelreuteria paniculata *	0	07	1	3	2	2		0		6	0			10	0	10	0	7	0	6	0	+100
Kolkwitzia amabilis	04	40	0	0	1		4	0			0			10	0			7	0	6	0	-150
Kunzea ambigua	11	31	4	0	1			0			0							2	0	5	0	-130
Kunzea pomifera	11	27	0	0	1			0			1							4	0	5	0	-30
Laburnum anagyroides *	07	18	1	3	1		5	0			0	5	0	1	0	1	0	2	0	5	0	+130
Lagerstroemia indica *	0	19	3	0	2	1	5	0			0	6	0	8	0	4	0	7	0	7	0	+110
Lagunaria patersonii *	0	03	4	3	1	2		0			0	5	1	9	0	9	1			5	1	-130
Lantana camara *	0	26	6	0	2		6	0	1		0	1	3	6	1	5	0			10	0	+290
Lantana montevidensis *	0	26	6	0	2		5	0			0	1	0	6	0	5	0			9	0	+290
Larix decidua *	14	1	2	2	1		2	0	3	3	0	5	0	4	0	4	0	5	0	5	0	-20
Laurus nobilis *	06	18	6	0	1	1	5	1			1	5	0	1	0	1	0	2	0	5	0	+140
Lavandula angustifolia *	09	31	3	2	1		5	0			1	5	0	2	0	1	0	2	0	4	0	+180
Lavandula dentata	09	31	3	2	1		5	0			1	5	0	4	0	1	0	6	0	2	0	+150
Lavandula stoechas *	09	27	3	2	1		4	0	1		1	5	0	1	1	1	2	6	0	6	2	+190
Leonotis leonurus *	09	27	0	0	1	3		0			1	1	1	5	0	2	0			6	1	+170
Leptospermum flavescens	11	18	1	2	1		2	0	2		0							2	0	7	0	-150
Leptospermum laevigatum *	11	18	1	2	1	3	2	0	2		1					1	1	2	0	7	1	+10
Leptospermum scoparium	11	27	1	3	1	3		0	2		0					1	0	2	0	7	0	-10
Leucodendron argenteum	15	18	1	0	1	2	3	0			1			5	0	4	0			2	0	-50
Leycesteria formosa *	04	40	2	0	0			0			1	7	0	8	1					7	1	-40
Ligustrum japonicum *	12	28	2	2	1		5	0			0	6	0	9	0	9	0	7	0	5	0	+40
Ligustrum lucidum *	12	18	2	2	1	2	5	0		5	1	6	2	8	2	8	0	7	1	7	2	+250
Ligustrum ovalifolium *	12	28	2	2	1		5	0			0	6	0	9	0	9	0			3	0	+30
Ligustrum sinensis *	12	18	2	2	1			0		5	1	6	2		0	8	0	7	2	6	2	+230
Ligustrum vulgare *	12	40	2	2	1		5	0		4	1	5	0	1	1	1	1	2	0	8	1	+320
Liquidambar orientalis	0	19	1	0	0		4	0			1							10	01	2	0	-20
Liquidambar styraciflua	0	07	1	2	2	2	4	0	3	3	0	4	0	3	0	2	0	2	0	6	0	+60
Liriodendron tulipifera	4	07	2	2	1	2		0	3	5	0	4	0	3	0	2	0	5	0	5	0	-10
Livistona australis	13	21	6	0	1		4	0			0			1	0	1	0			6	0	+50
Lonicera fragrantissima	04	28	6	0	1		1	0			0			10	0			7	1	3	1	-60
Lonicera japonica *	04	38	6	0	2		1	0			0	6	2	8	2	4	0	7	2	9	2	+200
Lonicera nitida	04	28	6	0	0		1	0			0			10	0	3	0	7	0	5	0	-30
Lonicera reticulata	04	28	6	0	0			0			0							9	0	3	0	-80
Lonicera sempervirens	04	38	6	0	0		4	0			0	1	0							6	0	+150
Lonicera tatarica *	04	28	6	2	1		1	0		2	1	10	0	10	0				1	7	0	-10
Loropetalum chinense	0	28	0	0	0			0			0							7	0	9	0	+20
Lycium barbarum	21	28	6	0	0		2	0							1						1	
Lycium ferocissimum *	21	27	6	0	2			0	1		0	6	2	5	2	2	2	4	2	5	2	+140
Macadamia integrifolia	15	01	8	1	1	1	3	0			0	1	0	4	0	4	0			4	0	-10
Macfadyena unguis-cati	03	37	1	0	0		7	0			0	1	0	3	0	3	0			10	0	+90
Mackaya bella *	0	27	0	0	0	2		0			0	3	0	8	0	6	0			6	0	0
Maclura pomifera *	0	04	7	2	0	3		1	3	5			1								1	
Magnolia grandifolia	06	1	6	2	1	3	7	0	3	5	0	6	0	3	0	3	0	5	0	3	0	0
Magnolia heptapeta	06	1	6	2	1			0			0			10	0	8	0	7	0		0	-50
Magnolia quinquepeta	06	40	6	2	1			0			0	6	0	10	0	10	0	7	0	2	0	-160
Magnolia stellata	06	18	6	2	1		4	0			0	6	0	9	0			7	0	4	0	-50
Mahonia aquifolium	02	28	6	0	1		3	0			1			5	0	2	0	9	1	4	1	-40
Mahonia bealei	02	28	6	0	1			0			0			6	0	9	0	7	0	6	0	-30
Mahonia fortunii	02	28	6	0	1			0			0	6	0	10	0					3	0	-50
Mahonia japonica	02	28	6	0	1		3	0			0	6	0	10	0			8	0	4	0	-50
Malus spectabilis	16	19	6	0	1		6	0			0			10	0	10	0	9	0	5	0	+10
Malus Xdomestica *	16	19	7	0	2		6	0		6			1		2		1		1		2	
Mandevilla laxa	0	37	0	0	0			0			0	8	0	9	0	8	0			6	0	-70
Melaleuca armillaris	11	20	1	0	1	2	2	0			0			1	1	1	1	2	0	3	1	-110
Melaleuca bracteata	11	20	1	0	1	2		0			0							2	0	9	0	-120
Melaleuca decussata	11	18	1	0	1			0			1							6	0	6	0	-70
Melaleuca diosmifolia	11	18	1	0	1			0			0									6	0	
Melaleuca ericifolia	11	20	1	0	1		2	0			0							2	0	6	1	-170
Melaleuca hypericifolia	11	31	1	0	1	1	2	0			0			6	1	4	2			4	2	-180
Melaleuca incana	11	31	1	0	1			0			1							6	0	4	0	-80
Melaleuca lateritia	11	31	1	0	1		2	0			1			7	0			9	0	2	0	-170

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Melaleuca leucadendra	11	03	1	0	1			0			0					8	0			7	0	-210
Melaleuca linariifolia	11	20	1	0	1	2	2	0			0							1	0	8	0	-40
Melaleuca nesophila	11	18	1	0	1			0			1					1	1			3	1	+10
Melaleuca radula	11	20	1	0	1			0			1					1	1			6	1	+10
Melaleuca squarrosa	11	18	1	0	1			0			1							2	0	6	0	-60
Melaleuca styphelioides	11	18	1	0	1	2	2	0			0			1	0	1	0			6	0	-70
Melaleuca thymifolia	11	27	1	0	1		2	0			0							1	0	6	0	-30
Melaleuca wilsonii	11	20	1	0	1			0			1					1	0	6	0	3	0	-10
Melia azedarach *	0	02	6	2	2	3	3	0			0			6	0	5	0	2	0	7	0	+160
Mespilus germanica *	16	19	7	0	1		4	0			1	6	0	2	0	2	0			6	0	+70
Metrosideros excelsus *	11	03	0	0	1	1		0			0	5	0	4	0	4	0			4	0	-210
Michelia figo	06	28	7	0	1	1	4	0			0	8	0	10	0	10	0	9	0	3	0	-120
Microcoelum weddellianum	13	21	6	0	1			0			0	1	0	6	0	7	0			6	0	+60
Miscanthus sinensis	0	1	1	0	2		6	0					1								1	
Monstera deliciosa	0	37		0	2		6	0			0	7	1			8	0			7	1	+60
Morus alba *	0	07	6	2	1	3	3	1	2	1	1	7	1	9	0	9	1	8	0	5	1	+70
Morus nigra *	0	19	6	2	2		7				0	9	0	7	0	6	0	8	0	4	0	+110
Muehlenbeckia complexa *	0	38	0	0	0		1	0			0			1	0			6	0	5	0	+120
Muraltia heisteria	0	31	0	0	0			0									1				1	
Murraya paniculata	18	16	6	0	1		1	0			0	7	0							3	0	-110
Musa Xparadisiaca *	0	21	7	0	2		4	0					1								1	
Myoporum acuminatum	0	27	6	0	1			0									2				2	
Myoporum parvifolium	0	27	6	0	1			0			1							2	0	6	0	+90
Myrtus communis	11	27	6	0	1		2	0			1	2	0	1	0	1	1	1	0	6	1	+100
Nandina domestica	02	28	6	0	1		3	0			0	7	0	9	0	9	0	8	1	7	1	-40
Nerium oleander *	0	27	1	0	1	2	2	0	1	3	1	5	1	1	0	1	0	2	0	6	0	+140
Nicotiana glauca *	21	16	3	0	1		5	0	1		0	1	1			4	1			6	0	+70
Ochna multiflora *	0	27	6	0	2	1	4	0			1	3	1	5	0	2	0			7	1	+190
Olea africana *	12	4	6	0	1			0			1	1	2			4	2	2	1	8	2	+210
Olea europaea *	12	4	6	3	1	1	5	0			1	5	0	1	0	1	2	2	0	6	2	+200
Olearia stellulata	01	27	1	0	1			0			0							6	0	6	0	-40
Opuntia imbricata *	0	34	6	3	2		1	0							1						1	
Opuntia robusta	0	34	6	3	2			0							1		2				2	
Opuntia stricta *	0	34	6	3	2			0			0	1	1	3	2	1	1	2	1	7	2	+190
Opuntia vulgaris *	0	34	6	3	2		4	0									1				1	
Osmanthus fragrans	12	28	6	0	0	1	5	0			0	6	0					7	0	8	0	+90
Osmanthus heterophyllus	12	28	6	0	0			0			0	6	0			9	0	7	0	6	0	+20
Pachysandra terminalis	0	33	0	0	0			0			0							7	0	6	0	-10
Paeonia suffruticosa	2	28	0	0	1		1	0			0	7	0	10	0	9	0			6	0	-60
Pandanus utilis	0	21	6	0	1			0			0	7	0							6	0	-40
Pandanus veitchii	0	21	6	0	1			0			0	9	0							2	0	-130
Pandorea jasminoides	03	37	1	0	1			0			0	1	0	6	0	5	0	2	0	7	0	-10
Pandorea pandorana	03	37	1	0	1			0			0			3	0			1	0	8	0	+40
Parthenocissus quinquefo.	*0	39	6	2	2		4	0		5	0	3	1	9	0	3	0	2	0	7	1	+120
Parthenocissus tricuspid.	*0	39	6	0	2		4	0			0			9	0	9	0	7	0	8	0	+130
Passiflora alata	0	38	6	0	1			0			0	9	0					10	0	7	0	-10
Passiflora alba	0	38	6	0	1			0					1								1	
Passiflora antioquiensis	0	38	6	0	1			0			0	3	0	6	0	7	0			6	0	+50
Passiflora caerulea *	0	38	6	0	1		1	0			0	1	1	6	0	5	0			6	1	+130
Passiflora edulis *	0	38	7	0	1		1	0			0	5	2	10	0	10	0	9	0	6	2	+60
Passiflora manicata	0	38	6	0	1		1	0			0	5	0	5	0	4	0			8	0	+80
Passiflora mollissima *	0	38	6	0	1		1	0			0	5	0	5	1	4	0			8	1	+80
Paulownia tomentosa *	03	07	1	0	1	3	4	0		1	1	8	0	10	0	10	0	8	0	5	0	+30
Pelargonium Xdomestica	0	28	4	0	0		5	0					1		1		1				1	
Pelargonium Xhortorum	0	28	4	0	0		1	0					1		1		1				1	
Philadelphus inodorus	04	28	1	0	1		2	0		1	0	5	0	3	0	3	0	5	0	3	0	-130
Phlomis fruticosa	09	27	0	0	0			0			1							2	0	5	0	+90
Phoenix canariensis *	13	21	6	0	1		4	1			0	9	0	10	0	7	0			7	0	-100
Phoenix dactylifera	13	21	6	0	1		4	1			0	8	0	7	0	4	0			8	0	+30
Phoenix reclinata	13	21	6	0	1		4	1			0	1	0	5	0	2	0			8	0	+100
Phormium tenax *	22	24	0	1	2		4	0			0	5	0	1	0	1	0	6	0	6	0	+170
Photinia glabra	16	28	6	0	1		4	0			0	6	0	9	0	9	0	7	0	5	0	+30
Photinia serrulata	16	28	6	0	1	1	4	0			0	6	0	8	0	4	0	7	1	6	1	+20
Phyllostachys aurea *	0	1	1	0	2		5	0			0	6	2							6	2	+140
Phyllostachys nigra	0	1	1	0	2		5	0			1	6	0	10	0	8	0	7	0	5	0	+210
Physalis peruviana *	21	26	6	0	1		5	0			0	7	1					8	0	6	1	0
Picea abies *	14	1	1	2	1		2	0	3	3	0			2	0	2	0	2	0	7	0	-20
Picea glauca	14	1	1	2	1	1		0	3	2	0			7	0	8	0	6	0	6	0	-10
Picea pungens	14	1	1	2	1	1		0		3	0	6	0	9	0	6	0	6	0	5	0	-20

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Pieris japonica	04	18	1	0	1			0		2	0			10	0	9	0	7	0	5	0	-80
Pimelea ferruginea	0	27	0	0	1			0			1			4	0	1	0	6	0	2	0	+120
Pinus canariensis	14	10	2	0	1	3	2	0		6	1	10	0	10	0	10	0	10	0	3	0	-10
Pinus halepensis *	14	10	1	2	1	3	2	0	3	4	1	5	0	2	0	1	2	2	1	4	1	+120
Pinus mugo	14	20	1	1	1		2	0	3	4	0			2	0			2	0	5	0	-70
Pinus nigra	14	12	1	2	1		2	0	3	4	1	2	0	1	1	1	2	2	0	7	2	+140
Pinus patula *	14	12	1	2	1	3	2	0			0							6	0	5	0	-80
Pinus pinaster *	14	10	1	2	1	3	2	0	3	6	1	4	0	1	2	1	2			6	2	+110
Pinus pinea *	14	10	1	3	1	2	2	0		6	1			9	0	1	0	1	0	6	0	+120
Pinus ponderosa *	14	12	2	3	1	2	2	0	3	5	1			6	0	6	1	6	0	8	1	+80
Pinus radiata *	14	12	1	2	1	3	2	0	3	4	1	5	2	9	2	7	2	10	2	2	2	-30
Pinus roxburghii *	14	12	2	1	1	3	2	0	3	5	0	8	0			10	0			7	0	-30
Pinus sylvestris *	14	12	1	2	1	2	2	0	3	3	1	5	0	1	0					9	0	+130
Pinus thunbergiana	14	12	1	1	1			0	3	4	0							7	0	6	0	-50
Pinus torreyana	14	12	2	2	1		2	0	3	7	1							10	0	2	0	-80
Pinus wallichiana *	14	12	1	0	1	1		0			0	7	0	9	0					7	0	-80
Pistacia chinensis	0	07	6	0	1			1			0							7	1	8	1	+50
Pittosporum crassifolium	*0	18	6	0	1	1	2	0			0	5	0			6	0	9	0	5	0	-60
Pittosporum eugenioides	0	04	6	0	1		2	0			0	5	0			1	0	6	0	5	0	+60
Pittosporum tenuifolium	0	18	6	0	1		2	0			0					1	0	6	0	5	0	+50
Pittosporum tobira	0	18	6	0	1		2	0			0	6	0	9	0	8	0			6	0	-40
Pittosporum undulatum *	0	04	6	2	1	3	2	0	2		0			1	2	1	2			6	2	+80
Platanus orientalis	0	07	1	0	1		5	0		2	0	2	0	6	0	2	0	4	0	8	0	+50
Platanus Xacerifolia	0	07	1	0	1	2	5	0		2									1		1	
Platycladus orientalis	05	12	4	0	1		2	0			0	1	0	1	0	5	0	7	0	8	0	+90
Plumbago auriculata	0	27	0	0	2	2		0			0	1	0	5	0	4	0	2	0	7	0	+190
Plumeria acuminata	0	19	0	0	2	2	4	0			0	0	1			8	0			7	1	+50
Podocarpus totara	0	1	7	0	1			1			0	5	0	1	0					5	0	+10
Polygala myrtifolia *	0	27	5	0	1	2	4	0			1	1	2	5	2	2	1	2	0	6	2	+180
Polygala virgata *	0	27	5	0	1	2	4	0			0	3	1	8	0	6	0			5	1	+80
Polygonum capitatum *	0	33	5	0	2			0			1	7	1							7	1	+180
Populus alba *	19	07	3	1	2		6	0		1	1	7	2	2	1	1	1	1	2	7	2	+380
Populus balsamifera	19	07	1	1	2		4	0		1	0							6	0	7	0	+120
Populus deltoides *	19	07	2	1	2	3	4	1	3	1	0			3	0			2	0	7	0	+150
Populus nigra *	19	07	1	1	2	3	6	1		1	1	2	0	1	1	1	1	2	2	10	2	+400
Populus simonii	19	07	1	1	2		4	0		1	0							7	0	7	0	+120
Populus tremula	19	07	1	1	2		7	1	3	1	1	5	0	1	0	1	0	2	0	10	0	+380
Populus yunnansis	19	07	1	1	2			0		1	1							9	0	4	0	+150
Prostanthera nivea	09	31	0	0	1			0			0							1	0	6	0	-50
Prostanthera ovalifolia	09	27	0	0	1			0			0							1	0	6	0	+80
Protea mellifera	15	27	2	0	1		2	0			1	6	0	5	0	2	0			5	0	+50
Prunus americana *	16	19	7	2	1		1	0		7	0	6	1	10	0	8	1	7	1	7	1	+10
Prunus avium *	16	19	6	2	1		4	0		6	1	2	0	1	0	1	0	1	0	10	0	+250
Prunus cerasifera *	16	19	7	2	2	2	1	0		6	1			1	2	1	1	1	2	8	2	+360
Prunus domestica *	16	19	7	2	2		5	0							0		1		0		1	
Prunus dulcis	16	19	7	2	1		1	0		7	1	6	0	1	0	1	1	6	0	7	1	+200
Prunus glandulosa	16	40	6	2	2		1	0			0	6	0	10	0	10	0	7	0	6	0	+90
Prunus japonica	16	40	6	2	0		1	0			0	6	0	10	0			7	0	7	0	-40
Prunus laurocerasus *	16	18	6	2	0	1	7	0			1	2	0	1	1	1	2	1	0	4	2	+230
Prunus lusitanica	16	4	6	2	0		6	0			0	7	0	5	0	2	0	9	0	2	0	+70
Prunus maritima	16	40	6	2	0		1	0			0							5	0	2	0	-20
Prunus mume	16	19	6	2	0		2	0			0			9	0	8	0	7	0	6	0	+50
Prunus nigra	16	19	6	2	0		1	0			0							8	0	6	0	+50
Prunus persica *	16	19	7	2	1	2	1	0		7			1		1		1		1		1	
Prunus salicina	16	19	6	2	0		1	0			1							7	0	6	0	+11
Prunus serrulata	16	07	6	2	1	1	1	0			0			10	0	10	0	7	0	5	0	+40
Prunus triloba	16	40	6	2	1		6	0			0									6	0	
Psidium guajava *	11	16	7	3	2	1	5	0	1	6	0	5	0	6	0	7	0			9	0	+50
Psidium littorale	11	16	7	0	0			0			0	4	0	6	0	7	0			7	0	-210
Psoralea pinnata	07	27	4	3	1	3		0			1	1	1	5	1	2	0			7	1	+250
Punica granatum *	0	19	7	0	1	1	1	0			1			1	0	1	0	6	0	7	0	+80
Pyracantha angustifolia	*16	31	6	0	1	3	4	0	2		1	6	2	9	2	8	1	7	3	6	3	+240
Pyracantha coccinea *	16	28	6	0	1	2	4	0	2		1	2	0	2	0	1	0	1	1	6	0	+310
Pyracantha crenulata	16	31	6	0	1		4	0	2		0	6	2	9	2	8	0	7	2	5	2	+190
Pyracantha fortuneana	16	28	6	0	1		4	0	2		1	6	2	10	1			7	2	6	2	+230
Pyracantha rogersiana	16	28	6	0	1			0	2		0							7	2	7	2	+160
Pyrostegia venusta *	16	28	6	0	1			0			1	1	0	6		7	0		0	6	0	+70
Pyrus calleryana	03	37	1	0	1			0										7	1		1	+60
Pyrus communis	16	19	6	0	1		4	0														
	16	19	7	0	1	2	4	0		5	1	2	1	1	0	1	1	1	1	9	1	+230

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Pyrus ussuriensis	16	19	6	0	1		4	0			0											
Quercus acutissima	08	07	8	1	1	3	2	0			1							7	0	5	0	
Quercus bicolor	08	07	8	1	1	2	2	0	3	7	0							7	0	8	0	+100
Quercus canariensis *	08	4	8	1	1	2	2	0			1							5	0	4	0	-80
Quercus cerris *	08	07	8	1	1	2	2	0			1	2	0	1	0			6	0	2	0	-30
Quercus coccinea	08	07	8	1	1	2	2	0	3	7	0			1	0	3	0	2	0	6	0	+30
Quercus engelmannii	08	4	8	1	1		2	0			1							5	0	4	0	-90
Quercus faginea	08	07	8	1	1		2	0			1							9	0	4	0	-60
Quercus ilex *	08	4	8	1	1	1	2	0			1	5	0	3	0	1	0	2	0	5	0	+20
Quercus macrocarpa	08	07	8	1	1	1	2	0	3	7	0							1	2	6	2	0
Quercus palustris	08	07	8	1	1	2	2	0	3	7	0	6	0	1	0	8	0	2	0	6	0	-20
Quercus robur *	08	07	8	1	2	2	2	0	3	7	1	2	1	1	2	1	1	5	1	4	1	-90
Quercus rubra	08	07	8	1	1	2	2	0	3	7	0	6	0					1	2	8	2	+270
Quercus suber *	08	4	8	1	1	1	2	0		7	1	6	0			1	1	5	0	7	0	-80
Quercus virginiana	08	04	8	1	1		1	0		7	0	5	0					6	0	7	1	-10
Quisqualis indica	0	37	3	0	1		3	0			0	5	0					2	0	6	0	-70
Raphiolepis indica	16	26	6	0	1	1	4	0			1	8	1	10	0	10	0			7	0	-80
Raphiolepis umbellata *	16	28	6	0	1	1	4	0			0	6	0	9	0	9	0	8	0	5	1	+90
Rhamnus alaternus *	0	27	6	2	1	1		0			1	5	0	2	0	1	2	7	0	5	0	+10
Rhododendron indicum	04	28	1	0	1		3	0			0	6	0	10	0	10	0			6	2	+170
Rhododendron molle	04	28	1	0	1		3	0			0	6	0	10	0	8	0	7	0	2	0	-90
Rhus succedanea *	0	19	6	0	1	2	4	0			1	6	2	3	0	3	0	7	0	3	0	-90
Ribes aureum	04	28	6	2	1		1	0		2	1	7	0	1	0	4	0	6	0	9	2	+90
Ribes nigrum *	04	28	6	2	1		1	0			0	5	0	2	0			6	0	7	0	+120
Ribes sanguineum	04	28	6	2	1		1	0			0	5	0	6	0	5	0	1	0	10	0	+70
Ribes speciosum	04	28	6	2	1		1	0			1	10	0	9	0	7	0	9	0	6	0	-60
Ribes uva-crispa	04	28	6	2	1		1	0		3	1									3	0	0
Ricinus communis *	0	26	3	3	1		1	0	1		0	3	1	6	1	6	2	2	0	8	0	
Robinia hispida	07	40	2	3	1			0			0	4	0	3	0	3	0			8	2	+40
Robinia pseudoacacia *	07	07	2	3	1	3	2	0	3	4	0	6	2	2	0	2	1	5	2	4	0	-40
Rochea coccinea	0	34	0	0	0			0			1	7	0							3	2	+180
Rondeletia anomala	04	18	0	0	1		4	0			0	7	0	9	0					2	0	+30
Rondeletia odorata	04	26	0	0	1		5	0			0	9	0			10	0			5	0	-70
Rosa banksiae	16	19	6	0	1		1	0			0			8	0	5	0	7	0	6	0	-70
Rosa canina	16	40	6	0	2		5	0		6					1		2				0	+30
Rosa rubiginosa *	16	40	6	0	2		4	0	3	6	1	5	1	1	2	1	1	1	2	9	2	
Rosmarinus officinalis	09	31	5	0	1		2	0			1	5	0	2	0	1	1	2	0	7	1	+310
Rothmannia globosa	04	18	0	0	1	1		0			0	3	0	8	0					6	0	+140
Rubus discolor	16	28	6	0	2			0			1	2	1							8	1	-50
Rubus idaeus *	16	28	6	2	2		7	0		2	1	6	0	1	0	1	0	2	0	10	0	+300
Rubus laciniatus *	16	28	6	2	2		3	0					1		1						1	+420
Rubus phoenicolasius *	16	28	6	0	2		1	0			0			9	0			7	0	7	0	+100
Rubus procerus	16	28	6	0	2		5	0					1								1	
Rubus ulmifolius	16	28	6	0	2			0		2			2		2		2				2	
Rubus ursinus	16	33	6	0	2		7	0			0	6	0	9	0	5	0	9	0	6	0	+100
Rubus vulgaris	16	28	6	0	2		2	0			1	2	2							8	2	+290
Russelia equisetiformis *	0	27	0	0	1		1	0			0	5	0	8	0	8	0			7	0	-30
Salix alba *	19	07	3	1	2		7	1		1	1	6	0	1	2	1	0	2	2	8	2	+430
Salix babylonica *	19	07	3	1	2	3	7	1		1	1	7	2	9	2	8	1	7	2	6	2	+200
Salix caprea *	19	19	3	1	2	2	7	1		1	1			1	0			2	0	10	0	+390
Salix cinerea	19	40	3	1	2		7	1		1					1						1	
Salix fragilis *	19	07	3	1	2		7	1		1					2						2	
Salix Xrubens	19	19	3	1	2			1		1					0		1				1	
Salvia officinalis *	09	32	0	2	1		1	0			0	5	0	2	0	2	0			6	0	-30
Salvia splendens	09	26	0	0	1		5	0			0	9	0	10	0	10	0	10	0	6	0	-70
Sambucus nigra *	04	26	6	0	1	3	4	0	3	5	0	2	0	1	0	1	0	1	0	6	0	+90
Santolina chamaecyparissa*	01	32	0	0	1			0			1							2	0	4	0	-60
Schinus molle *	0	02	6	0	1	1	3	1	1	6	0	6	2	5	2	4	2	9	0	6	2	+60
Senecio angulatus	01	1	0	0	2		7	0			0			5	1	4	1			4	1	+150
Senecio macroglossus	01	38	1	0	2			0			0	1	1							6	1	+220
Senecio mikanioides *	01	38	1	0	2		1	0			1	1	2		2	2	1			6	2	+290
Sequoia sempervirens	0	09	1	2	2	3	6	0	3	3	1	7	0	6	0	7	0	9	0	2	0	+110
Sequoiadendron giganteum	0	09	1	0	2			0	3	3	1	8	0	8	0	4	0	8	0	2	0	+70
Solandra grandiflora	21	37	1	0	1		2	0			0	5	0	9	0	10	0			5	0	-130
Solanum jasminoides *	21	37	6	0	1		2	0			0	7	0	6	0	6	0	2	0	6	0	+20
Solanum mauritianum *	21	26	6	0	2			0	2		0	1	1							6	1	+190
Solanum pseudocapsicum *	21	26	6	0	1		2	0			0	1	1	6	1					4	1	+50
Solanum seaforthianum *	21	38	6	0	2		4	0			0	9	0			10	0			5	0	+90

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Solanum wendlandii	21	37	6	0	1		2	0			0	10	0	10	0	10	0			4	0	-140
Sollya heterophylla	0	38	6	0	1			0			1	9	0	9	2	6	2	10	0	3	2	+100
Sophora japonica *	07	07	0	3	1	2	3	0			0	6	0	8	0	5	0	7	0	10	0	+90
Sophora tetraptera	07	04	3	3	1		1	0			0	5	0	1	0	1	0	6	0	4	0	+140
Sorbus aucuparia *	16	07	6	2	2		4	0		3	1	5	0	1	0	1	0	2	0	9	0	+410
Sorbus domestica *	16	07	6	2	2		4	0			1							1	2	8	2	+410
Sparmannia africana	0	26	0	0	1	3	7	0			0	1	0	5	0	4	0			4	0	+80
Spartium junceum *	07	27	5	3	1	3	6	0		6	1	5	0	1	1	1	0	2	1	6	1	+360
Spiraea cantoniensis	16	40	0	0	1			0			0	8	0	10	0	10	0	9	1	3	1	-100
Spiraea corymbosa	16	40	0	0	1		4	0			0	6	0			8	0	5	0	4	0	-90
Spiraea douglasii	16	40	0	0	1		4	0			0	7	0	6	0	5	0	9	0	6	0	-80
Spiraea hypericifolia	16	40	0	0	1		1	0			1	5	0	1	0					9	0	+50
Spiraea japonica	16	40	0	0	1		4	0			0			9	0	9	0	7	1	7	1	-130
Spiraea prunifolia	16	40	0	0	1		1	0			0	6	0	9	0	9	0	7	0	6	0	-80
Spiraea thunbergii	16	40	0	0	1		1	0			0			10	0			7	0	3	0	-80
Stenocarpus cunninghamii	15	16	0	0	1		2	0			0	1	0	6	0	5	0			6	0	-10
Stephanotis floribunda	0	37	0	0	1		2	0			0	7	0	9	0	9	0			6	0	-100
Stigmaphyllon ciliatum	0	37	1	0	1			0			0	1	0	1	0	7	0			7	0	+10
Strelitzia alba	0	21	1	0	1			0			0	6	0	5	0	2	0			2	0	-110
Strelitzia reginae	0	21	1	0	1		1	0			1	1	1	5	0	2	0			5	1	+80
Streptosolen jamesonii	0	28	0	0	1		2	0			1	7	0	5	0	4	0			5	0	+20
Strobilanthes anisophyllus	0	26	0	0	1			0			0	8	0	10	0	10	0			5	0	-60
Strophanthus speciosus	6	32	0	0	1	1		0			0	1	0	5	0					6	0	+30
Swainsona galegifolia	07	28	0	3	1		4	0			1	1	0	2	0	2	0	1	0	7	0	+200
Symphoricarpos orbiculat*	04	28	6	2	2		1	0			1	6	0	8	0	8	0	2	0	7	0	+150
Syringa vulgaris *	12	19	1	0	1		5	0		2	1	6	0	1	0	1	1	6	0	5	1	+160
Syzygium jambos *	11	16	6	0	2	1		0			0	5	0							6	0	-40
Tamarix aphylla	0	20	3	0	1		2	0			1					4	1			8	1	+70
Tamarix chinensis *	0	20	3	0	1			0			1	6	0	10	0	8	0	7	0	8	0	+80
Tamarix gallica *	0	20	3	0	1	3	2	0			1	5	0	1	1	1	0	2	0	6	1	+130
Taxodium distichum	0	1	3	0	1	2		0		5	0	1	0	3	0	3	0	2	0	5	0	+150
Taxus baccata *	0	12	6	2	1		2	1	3	5	1	5	0	1	0	1	0	2	0	8	0	+190
Tecoma stans	03	16	1	0	1	2	4	0			0	4	0	6	0	7	0			9	0	+80
Tecomaria capensis	03	26	1	0	2	3		0			1	1	2	5	0	4	0			7	2	+240
Telopea speciosissima	15	26	1	0	1		2	0			0			1	0	1	0	2	0	4	0	+10
Tephrosia grandiflora	07	33	0	0	1		2	0			1	1	1							8	1	+240
Tetrapanax papyrifera *	0	16	0	0	1		5	0			0	6	0	1	0					6	0	+30
Teucrium fruticans	09	27	0	0	1			0			1							1	0	6	0	+160
Thuja occidentalis	05	12	1	2	1	2		0	3	2	0	6	0	8	0	8	0	5	0	4	0	-130
Thuja plicata *	05	09	1	2	1		2	0	3	2	1	7	0	5	0	2	0	8	0	5	0	-50
Thujopsis dolabrata	05	09	1	2	1			0			0	7	0	9	0	9	0	8	0	2	0	-150
Thunbergia alata	0	38	0	0	1		1	0			0	1	2	6	0	5	0			7	1	+100
Thunbergia erecta	0	26	6	0	1		6	0			0	9	0							6	0	-60
Thunbergia laurifolia	0	37	0	0	1		6	0			0	5	0							6	0	-60
Thymus serpyllum *	0	33	0	0	1		3	1			0							6	0	9	0	+10
Thymus vulgaris *	0	31	0	2	1		6	1			1	5	0	2	0	1	0	1	0	6	0	+160
Tibouchina urvilleana	0	26	0	0	1			0			0	1	1	6	0	7	0			6	1	+50
Tilia cordata	0	07	2	1	1		7	0	3	5	0							8	0	8	0	+60
Trachelospermum jasminoid.	0	37	0	0	1			0			0	6	0	9	0	8	0	7	0	7	0	-90
Tristania conferta	11	03	5	0	1		2	0		3	0	1	1	6	0	5	0			6	1	-60
Ulex europaeus *	07	27	5	3	1		7	0	1	5	1	5	1	1	2	1	2	6	0	6	2	+360
Ulmus americana *	0	07	1	1	1	2	6	0	3	3	0							2	0	7	0	-10
Ulmus carpinifolia	0	07	1	1	2		3	0			1			1	0			5	0	8	0	+300
Ulmus glabra	0	07	1	1	1		6	0			1	5	0	1	0	1	0	1	0	8	0	+220
Ulmus parvifolia *	0	07	1	1	1	2	3	0		2	0	6	0	9	0	9	0	7	1	8	1	-10
Ulmus procera *	0	07	1	1	2	2	3	0									2		1		2	
Ulmus Xhollandica	0	07	1	1	2		3	0									2		2		2	
Viburnum carlesii	04	40	6	2	1		2	0			0			9	0			7	0	2	0	-170
Viburnum japonicum	04	28	6	2	1		1	0			0	6	0	10	0	10	0	7	0	5	0	-50
Viburnum macrocephalum	04	28	6	2	1		1	0			0	6	0					7	0	5	0	-50
Viburnum odoratissimum	04	18	6	2	1	2	4	0			0	5	0	1	0	3	0			7	0	+50
Viburnum opulus	04	40	6	2	1	1	1	0		5	0	1	0	1	0	1	0	5	0	9	0	+40
Viburnum plicatum	04	40	6	2	1		1	0			0	6	0	9	0			7	0	6	0	-140
Viburnum sieboldii	04	40	6	2	1		4	0			0	6	0	9	0					5	0	-140
Viburnum suspensum	04	40	6	2	1		1	0			0	9	1	10	0	10	0			2	1	-230
Viburnum tinus	04	28	6	2	1	1	6	0			1	2	0	1	0	1	1	1	1	6	1	+150
Vinca major *	0	28	5	0	2		7	0			1	5	0	2	2	1	1	1	2	4	2	+340
Vinca minor *	0	28	5	0	2		5	0			1	2	0	1	1	1	0	1	0	8	0	+360
Virgillia capensis	07	16	0	0	1			0			0	6	0	5	0	2	0	4	0	5	0	-10
Vitex agnus-castus *	0	28	6	0	1	1		0		4	1	2	0	1	0	1	0	1	0	6	0	+140
Vitis vinifera *	0	39	6	0	1		6	0			1	6	1	2	1	2	1	1	1	6	1	+160

SPECIES	FAM	LF	D	S	R	G	C	D	F	W	K	SYD	W	MEL	W	ADE	W	CAN	W	EN	W	ISMS
Weigela coraeensis	04	28	1	0	1			0		0	6	0	9	0	9	0			3	0	-90
Weigela floribunda	04	28	1	0	1			0		0	6	0	9	0			7	0	3	0	-90
Weigela florida	04	28	1	0	1		6	0		0	6	0	10	0	10	0	7	0	6	0	-40
Weigela praecox	04	28	1	0	1		4	0		1			10	0					7	0	-50
Westringia fruticosa	09	31	0	0	1			0		0			1	0	1	0	2	0	3	0	+30
Wigandia caracasana *	0	26	1	0	2			0								1				1		
Wisteria floribunda	07	39	4	0	1		1	0		0			9	0	9	0	7	0	5	0	+30
Wisteria sinensis *	07	39	4	0	1		2	0		0	7	1	9	0	8	0	7	0	6	1	+20
Yucca aloifolia *	22	24	6	0	1			0		0	4	1	3	0	8	1			[illegible]	1	+20
Yucca filamentosa *	22	24	6	0	1			0		0					3	0	6	1	5	1	-30
Yucca gloriosa *	22	24	6	0	1		6	0		0			8	0	8	0	5	0	4	0	-10
Zelkova serrata	0	07	0	0	1	2		0		0							7	[illegible]	6	0	-30