Eucalyptus as an Exotic

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1. *Introduction*

The rapid growth of eucalypts makes them an attractive proposition as exotics in deforested areas, particularly where fast growing trees are needed for the rehabilitation of depressed agriculture. The trees may be better than any others for helping an agricultural population to replace dung as a fuel, to provide farm timbers from the farm itself, and to provide shelter from wind or sun. A number of species have proved outstandingly successful in several countries, and the time has now come when selected strains of these introductions could well be re-introduced to their old homeland.

2. *The Successful Exotic*

What makes a successful exotic ? Success depends upon general usefulness and one or more of several other characteristics including :

1) Ability to colonize bare ground without shelter;
2) Rapid early growth or high volume production;
3) Considerable variability within a species;
4) Vigour in the root system.

Several eucalyptus from a wide range of soils and climate possess these features, and have proved successful as exotics. Other species which are valuable in Australia do not have some of the features and have not been so successful as exotics.

3. *Growth Habits which yavour the Eucalypts as Colonizing Trees*

The success of eucalypts as colonizers is assisted by the following growth habits :

1) *Lignotubers or Root Swellings*

Seedlings of all eucalypts quickly develop a swelling near the junction of the root and the shoot. This swelling is of great value to the young trees in preventing death from insolation when seed germinates on bare ground. In all parts of Australia high temperatures

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are experienced at the junction of the soil surface with a growing shoot. Seedlings of plants which can develop a swelling quickly at this point, or form some shelter for the stem, are much better colonizers of bare ground than seedlings of species which have a narrow stem and an erect unbranched shoot during the first growing season.
In most eucalypts the swelling at ground evel becomes a boulbous mass known as a lignotuber. The lignotuber tends to grow down the stem and bury itself in the soil. It has the property of being able to regenerate new shoots and it is a wonderful protective adaptation.

2) *Bud Structure*

Eucalypts do not form resting buds. In the axil of each leaf there is a naked bud which can develop as soon as the leaf unfolds unless it is destroyed by accident or inhibited by plant hormones produced in the leaves near it. The naked bud is an indefinite shoot. It can go on producing leaves at its tip and extend in length as long as conditions suitable for growth continue. Should the tip be destroyed, a bud from a leaf axil near the tip will continue the shoot axis with little distortion, thanks to strong *apical dominance.*

3) *Apical Dominance*

This term describes the character in trees which enables the trunk or branches to continue their line of development. It is most marked on the main trunk. Should the tip of the trunk be destroyed, apical dominance permits the most favourably placed side-branch to continue the vertical axis.
Apical dominance is *strong in the eucalypts which are most popular as exotics.* It enables them to make long straight boles quickly, even though these boles may be made up of numerous «generations» of axillary shoots.
A great many of the eucalypts do *not* have strong apical dominance in their young stages. It is natural for these species to produce a succession of crooked or leaning shoots for several years while their root systems gain a strong grip on the soil. These inferior shoots are eaten by browsing animals or burned by fire in Australia. They are, however, repeatedly replaced from the lignoutubers. In time a straight shoot with strong apical dominance develops which makes a useful trunk. This growth habit is characteristic of most of the eucalypts of the savannah woodland and unfavourable soils of Australia. The habit has frequently caused disappointment when these species have been tried in other countries. *This is unfortunate, because the species concerned are hardy and produce valuable wood under difficult conditions.* Once the habit is understood, it can be counteracted and a good forest produced. The method of counteracting the habit is to cut back the early shoots once or twice and to

permit better shoots to develop from the continually strengthening lignotuber. This practice imitates what happens with the aid of animals and fire in the natural forest.
The lignotubers, bud structure and apical dominance of the eucalypts is described in more detail in «Growth Habits of the Eucalypts», published by the Forestry and Timber Bureau, Canberra.

4) *Variability within species*

There is a great deal of variation between individuals and strains of many eucalypts. This variation may be brought about in part by hybridisation, but it is also due in part to natural variation and to adaptation to conditions brought about by fluctuations in climate in the course of the evolution of the genus.
The mountain ranges of Australia run, in the main north and south. In the fluctuations of climate that have brought ice ages and warm periods to the middle latitudes of the northern hemisphere, the climate of Australia has also varied appreciably. In Australia, fluctuations of climate have been associated with the phenomenon of permanent snows in limited localities only. In other localities the effect has been to cause different species of plants, including eucalypts, to move closer to or further away from the equator, to move to greater or lesser altitudes, and what is perhaps even more important, to move to different aspects as the climate has varied. The result has been that numerous islands of species have been left over a considerable range of distance. These islands of species may be widely separated and may develop local characteristics by natural variation or by hybridisation with other species occurring in the locality.
There are many variants of the more widespread eucalypts of Australia, and should a species be desired as an exotic, it may be found that one variant excels in a given locality whereas another strain is unsatisfactory.
Opportunities for the selection of variants in Australia are almost unlimited, and one of the future objectives of the Forestry and Timber Bureau will be to seek out the most promising variants of the more desirable eucalypts and to distribute seed from them for seed orchard purposes. It is hoped that it will be possible in this way to improve plantations in other countries and to introduce better growing stock into the native forest of Australia.
The variation in eucalypt plantations outside Australia has reached the stage where it would be worth while for Australia to experiment with selected *Eucalyptus* seed obtained from these countries.
This should not be regarded as abnormal. It is a common form of crop improvement in other branches of agriculture. Some years ago the writer sent seed of *Pinus radiata* from Australia back to the late D.T. MacDougal in California. The seed had been taken from trees of the fourth generation away from California, and the strain had been subjected to some selection for dominance because of the

fact that at least 90 % of plantation seed comes from dominant trees.When raised in California, the resultant seedlings showed a more rapid rate of growth than seedlings from the natural stand at Monterey.

4. *Rules for the Selection of Species to suit given Climates*

The homeland of the genus *Eucalyptus,* the continent of Australia and the island of Tasmania, extends from latitudes 10°S. to 44°S. A few species also occur naturally in New Guinea, the Philippines, and the Indonesian Islands. Over this vast area there are many climates, cold and hot, humid and dry, with summer rainfall and with winter rainfall. If a country wishes to select suitable eucalypts for trial, the following rules will assist :

1) Ignore climatic indices which do not take into account the distribution of rainfall throughout the year. Australia has good weather records by world standards. Adequate figures for *type* of rainfall have been worked out for all districts and are available either in «The Natural Occurrence of the Eucalypts», Leaflet N.° 65, Australian Forestry and Timber Bureau; or «Eucalypts for Planting», issued by F.A.O.

2) In the case of the best high forest eucalypts, *suspect* the figures for total rainfall given in the two publications quoted, but *trust* the nature of the distribution of the rainfall throughout the year. The reason for suspecting total rainfall is that the Australian figures have been obtained in the main from the larger settlements which have developed along the railways. The railways are in the valleys and the better forests on the hills. The rainfall is appreciably higher on the hills. The hills are not high by world standards, usually no more than 1,000 to 2,000 feet above the valleys. The writer adds 10 inches to recorded local rainfall to estimate the total rainfall which produces the better Australian forests.

3) It is always safer to move species to closely similar soils and rainfalls. In choosing similar rainfalls, it is advisable to keep close to similar total rainfalls but more important to select similar rainfall distributions.

4) Species from a summer rainfall retain health better when moved to a winter rainfall than do species from a winter rainfall when moved to a summer rainfall. In Australia this applies strikingly to trees moved within Australia, as well as to exotics brought to Australia. The eucalypts of southern Australian winter rainfall regions are unhealthy in the summer rainfall regions of the north-east. Both eucalypts and several rain forest trees from northern Australia thrive as street trees in the south.

5) Species from a region where the atmospheric humidity is low tend to become unhealthy in a region where it is high. The converse

does not necessarily apply when the atmospheric humidity is very low for long periods.

6) Species move easily to regions of generally similar climate where the extremes of cold are less than in their native habitat. The converse is markedly true. Most trees from most parts of North America, Northern Europe or Asia will grow in Australia, but very few Australian trees will grow in most parts of the continents of the Northern Hemisphere. The northern continents, with large land masses extending towards the pole, develop occasional periods of severe cold and will support cold resistant trees only. The southern continents, Africa, South America and Australia, have the main bulk of their land masses extending to the tropics. They experience occasional periods of severe heat and have a high fire danger but they are the continents where exotics are most varied and most healthy.

7) If species are moved to regions of greater heat than that of their natural habitat, or to stronger dry winds, they are likely to be deformed but not necessarily killed.

5. *Problems of Seed Supply*

It will be easier to produce eucalypt seed cheaply in countries outside Australia than within Australia because of the fact that damage to Australian trees reduces vigour and thereby seed production. Countries introducing eucalypts as exotics should establish seed orchards and use these to produce their own seed. Seed orchards can be established at a wide spacing, and if enough bees or flies are available to ensure adequate pollination heavy crops of seed will be obtained.

Eucalypt seed can be obtained cheaply in Australia only when it can be collected at the same time as falling operations for timber utilisation are in progress. If trees have to be felled solely to collect the seed, the cost of falling will increase seed prices considerably. If mature trees must be climbed for seed, the cost of collection will be very great indeed.

When seed supply is plentiful and cheap, it is desirable to carry out a rigorous selection of seedlings when pricking out from the seed tray and again when planting out into the field. It is unfortunate that there seems little chance that Australian seed could be supplied at a price or in quantities that would permit other countries to carry out an initial rigorous selection in the seedling stage.

6. *Developing Strains from Superior Individuals*

In spite of the natural variability of the eucalypts, there is evidence that a high proportion of the seed from a female parent carries on the general vegetative characteristics of that parent. Seedlings from good trees develop better than seedlings form poor trees. This phenomenon has been the basis of improvement by selection in plants. The fact that

the eucalypts produce seed at an early age permits a more frequent turnover of generations and more rapid progressive selection than is possible with most trees of the world. This progressive selection of better individuals can be done with any sample of seed, but a greater degree of improvement is likely to be obtained if the work starts with good material in the first instance.

It should be possible to improve eucalypt forests throughout the world by selecting superior individuals of the more desirable species, raising seedlings from them, and planting these in known plots. If the favourable characters persist, the plots could be used as seed orchards for more substantial seed supplies. Australia could render a significant service by selecting superior individuals and supplying seed from them for seed orchard purposes, but the selection should not be restricted to Australia. The best individuals may show up in plantations in any of the other countries where the eucalypts are grown.

7. *Dangerous Pests*

1) *Larger animals.* In Africa elephants take pleasure in homing the trunks with their tusks. When eucalypts are used as shade trees over improved pastures, it is found that cattle eat the fibrous bark and may kill the trees by girdling. It seems that the animals eat the bark to obtain roughage when the pastures are lush.

2) *Leaf-eating insects.* Eucalypts grow more rapidly in other countries than in Australia because of the absence of insects which eat the leaves. Within Australia a variety of leaf-eating insects has evolved concurrently with the genus. Countries outside Australia desiring to establish eucalypt plantations should take the greatest care in keeping these insects out.

3) *Leaf-attacking fungi.* Whereas leaf-eating insects are probably the worst pest on eucalypts in Australia, leaf-attacking fungi also have their effect.

4) *Wood-attacking fungi.* The pith of practically all eucalypts in Australia is attacked by fungi in the seedling stage, and the attack of fungi on the wood continues from this period onwards from the pith outwards. While the tree is growing rapidly, the rate of diameter growth exceeds the rate at which fungi attack the wood from the pith radially outwards. In old age the trees do not grow in diameter so rapidly, the radial attack of the fungi from inside continues and finally overtakes normal growth increment. When the ring of woody substance is too weak to maintain the weight of the tree, the trunk falls over. From observations, the writer would guess that wood-attacking fungi already present in other countries, relish the wood of the eucalypts.

8. *The Eucalypt Root System and the Soil*

The root systems of good exotics colonize the soil vigorously with healthy root systems. The converse is also strikingly true. Sometimes a tree only becomes a successful exotic in a given locality when the correct mycorrhizal fungus is introduced. This was true of *Pinus radiata* in Australia. It is possible that the presence or absence of a suitable mycorrhizal fungus has influenced the success of some of the eucalypts as exotics, but more work is needed on the matter.

A factor of possibly greater significance is the effect of eucalypts on their own soil environment. It is known that eucalypt litter tends to restrict the development of the roots of seedlings. This is one reason why the genus regenerates best on mineral soil. Work is also going on in Australia to find out whether *Eucalyptus* species tend to be self-inhibitory, and if so, what can be done to counteract the tendency. If the eucalypts tend to become self-inhibitory with time, it would help to explain the greater vigour of the genus when used as an exotic.

9. *Problems of Utilisation*

The eucalypts have been attractive as exotics partly because of rapid growth and partly because the wood of several species has a reputation for durability. The trees have given some disappointment when the durability of the wood from plantations has been compared with the durability found in timber from the native forest. There has been disappointment also when plantation eucalypts have been used sawmilling.

Fast-grown eucalypts from plantations outside Australia should be suspect so far as durability is concerned. Experience in South Africa has shown that preservation of all material used as poles or posts is desirable. Wood preservation leads to a known durability, and therefore a reliable product.

There will always be problems in milling fast-grown eucalypts. As the trees increase in diameter they shorten sligthly in length, and this leads to development of severe compression stresses in the centre of the stem. These compression stresses cause considerable distortion in planks sawn from the trees unless special sawing methods are developed. This phenomenon is described in more detail in — «Growth Habits of the Eucalypts» — referred to above.

10. *Species suitable for Different Conditions*

Foresters desiring to use the eucalypts as exotics will wish to know the characteristics of the more important species. Summaries of these characteristics are provided in Leaflet N.° 65 — «The Natural Occurrence of the Eucalypts», published by the Forestry and Timber Bureau in 1953; in «Eucalypts for Planting», published by F.A.O. in 1955; and «Forest Trees of Australia», published by the Forestry and Timber Bureau in 1957.

As a preliminary guide to species which might be selected for trial, a table giving notes showing the range of the main species, the climate of their natural habitat, their climatic and edaphic tolerance and indications of seed availability in Australia has been prepared as an apprendix to this paper. The notes will bring up to date the information published in the «Forest Seed Directory» issued by F.A.O. in 1956.

APPENDIX I

Occurrence and Characteristics of Species

The tabular statements which follow show the characteristics of the localities of occurrence of the more important eucalypts, and give some indication for each species listed of features of interest in considering the species as an exotic. The tables show how these features vary in different localities of occurrence.

If a species is considered suitable for trial in a given locality outside Australia, it may be worth experimenting with those strains of the species which have the best height growth and vigour in Australia, even though these strains may grow in places with a type of climate rather different from that of the locality of the trial. Should these vigorous strains succeed, well and good. If not, it may be worth experimenting with less vigorous strains from a more comparable type of climate. Natural variability and selection may gradually improve the new strain tried, if it is successful.

The tables show the wide range of natural occurrence of many of the eucalypts and the difference in their characteristics and tolerance over this range. It would be possible to organise the collection of experimental samples of seed for most of the natural range shown for each species, although the collection in many places would involve considerable time and expense.

Type of Climate

There are 18 tables, representing climatic zones based primarily on variation in mean annual temperature, with a secondary grouping for variation in mean annual rainfall. The climatic zones correspond to those used for the eucalypts in the F.A.O. «Forest Seed Directory» of 1956. They are defined as follows :

1. *Mean annual temperature* 45 — 50° F. (7.2 — 10° C.)

   1) Mean annual rainfall more than 40 inches (1016 mm.) Zone 1
   2) Mean annual rainfall 25-40 inches (635-1016 mm.) ... Zone 2

2. *Mean annual temperature* 50 — 60° F. (10 — 15.5° C.)

   1) Mean annual rainfall more than 40 inches (1016 mm.) Zone 3
   2) Mean annual rainfall 25-40 inches (635-1016 mm.) ... Zone 4
   3) Mean annual rainfall 15-25 inches (381-635 mm.) .... Zone 5
   4) Mean annual rainfall 8-15 inches (203-381 mm.) .... Zone 6

3. *Mean anual temperature* 60 — 70° F. (15.5 — 21.1° C.)

1) Mean annual rainfall more than 40 inches (1016 mm.) Zone 7
2) Mean annual rainfall 25-40 inches (635-1016 mm.) ... Zone 8
3) Mean annual rainfall 15-25 inches (381-635 mm.) .... Zone 9
4) Mean annual rainfall 8-15 inches (203-381 mm.) .... Zone 10

4. *Mean annual temperature* 70 — 80° F. (21.1 — 26.7° C.)

1) Mean annual rainfall more than 40 inches (1016 mm.) Zone 11
2) Mean annual rainfall 25-40 inches (635-1016 mm.) ... Zone 12
3) Mean annual rainfall 15-25 inches (381-635 mm.) .... Zone 13
4) Mean annual rainfall 8-15 inches (203-381 mm. .... Zone 14

5. *Mean annual temperature over* 80° F. (26.7° C.)

1) Mean annual rainfall more than 40 inches (1016 mm.) Zone 15
2) Mean annual rainfall 25-40 inches (635-1016 mm.) ... Zone 16
3) Mean annual rainfall 15-25 inches (381-635 mm.) .... Zone 17
4) Mean annual rainfall 8-15 inches (203-381 mm.) .... Zone 18

Within the table for each climatic zone the species are grouped according to their *growth type.* A list of characteristics is given against each species, the characteristics referring to the *zone in question only.* The listed characteristics show *height growth, range of latitude, range of altitude, likely variability, temperature tolerance, moisture tolerance, known edaphic tolerance, use within Australia* and *seed supply problems.*

Growth Types

The tables for each zone are divided into sub-groups of species separated according to their *growth type.* The growth types are :

1. *Non-lignotuberous* (N.L.)

These species do not develop lignotubers unless hybridised and are usually vigorous colonisers with strong apical dominance. They will make an erect stem in the first year of growth and most species are noted for rapid height growth.

2. *Vigorous lignotuberous* (V.L.)

These species develop lignotubers but are vigorous colonisers with strong apical dominance and rapid height growth.

3. *Moderately vigorous lignotuberous* (M.V.L.)

This group of species is lignotuberous and shows moderate but not strong apical dominance. They are not such vigorous colonisers as sub-groups 1 and 2, but may be more hardy under difficult conditions.

4. *Weakly vigorous lignotuberous* (W.L.)

This group shows weak apical dominance in Australia. The shoots of the first several years tend to be crooked and plagio-geotropic. This growth habit persists until the lignotuber is large and the root system is firmly established in the soil. A satisfactory erect mainstem may then be formed.

5. *Mallees and Marlocks*

This group covers the species which rarely make a single erect mainstem. The species develop a large sub-surface lignotuber from which several short-lived shoots grow. These short-lived shoots are replaced by others from the lignotuber when killed by fire or other means.

The Tabular Statements of Characteristics

The following characteristics are listed against each species :

1. *Species Name*

The nomenclature followed is that used by W.F. Blakely in «A Key to the Eucalypts», 1934, with a few recent changes, in which cases the name used by Blakely is given in brackets.

2. *Height Growth*

The height growth shown represents the height normally attained in Australia by mature dominant trees of the better strains of the species under good conditions (but not necessarily the best conditions) in the zone in which it is listed.

3. *Range of Latitude*

This is given in degrees, and refers to the zone being considered *only*.

4. *Range of Altitude*

This is given in feet, and refers to the occurrence in the zone in question *only*. S.L. = sea level.

5. *Variability*

The variability of each species is indicated as follows :

V.V. = very variable : strains from different localities within the zone, or even seed from different trees may give plantations having differing characteristics and tree form : this is *not* intended to cover variability caused by hybridisation.

M.V. = moderately variable.

N.V. = very stable species with little variability unless hybridised.

6. *Temperature Tolerance*

1) Tolerance to cold is indicated in two columns :

a) the absolute minimum recorded for the localities of occurrence within the zone;

b) the average number of days of frost per year recorded for these localities.

2) Tolerance to heat is indicated by :

a) the absolute maimum recorded for the localities of occurrence within the zone;

b) the greatest number of *successive* days over 100° F. (38° C.) recorded for these localities.

N.B. Temperatures are given in degrees Fahrenheit. The temperatures shown are those measured in a Stevenson Screen at a height of 4'6" (1.37 m.) from the ground. Frosts are assumed to occur when the screen minimum is 36° F. (2° C.)

7. *Moisture Tolerance*

1) *Rainfall Type*

a) by distribution :

W = winter rainfall
U = well distributed rainfall with moderate to good total
IRR = low rainfall from irregular storm rains likely to occur at any time : characteristic of southerninland Australia
S = summer rainfall
M = monsoon rainfall

b) by reliability :

The index number shown (i.e. 20, etc.) represents the average deviation above and below the normal as a percentage of the mean annual rainfall for the localities of natural occurrence.

2) *Air Humidity*

C = the locality of occurrence is influenced by coastal air, usually fairly humid and with short periods only of very dry air.

T = the locality of occurrence is on tablelands or mountains and the species is accustomed to appreciable periods of dry air.

INT = the locality of occurrence is in inland Australia and the species is accustomed to long periods of dry air.

3) *Evaporation*

Annual evaporation in inches from a free water surface in the localities of occurrence within the zone.

8. *Edaphic Tolerance*

Features of interest in exotics are indicated by a number, the number referring to the following characteristics :

1) A species of valley bottoms and relatively frost-resistant within the zone.
2) A especies of valley bottoms but not relatively frost-resistant within the zone.
3) A species of the slopes but relatively frost-resistant within the zone.
4) A forest species of the slopes in its natural habitat. Favours well-drained soils but likely to be cut in young stages by severe frosts for the zone.
5) Tolerant to rather heavy soil which are occasionally flooded.
6) Tolerant to frequently flooded soils.
7) Has shown some tolerance to soils which are becoming salty.
8) Strains occur on sandy soils.
9) Strains occur on basaltic soils.
10) Attains mature size when invaded by a rain forest understorey.
11) Hardy on very poor soils.
12) Tolerant to exposure to coastal winds.
13) Tolerant to exposure at higher elevations involving blizzards.
14) Tolerant to expossure under very dry conditions.

9. *Uses*

This item refers to use in Australia in the localities of occurrence. The uses are indicated by the following numbers :

1) Sawmilling
2) Railway sleepers
3) Poles and posts (without impregnation)

4) Strong timber but not durable
5) Foliage cut commercially for essential oils
6) Valuable for commercial tannin
7) Potential ornamental
8) Good windbreak species.

10. *Seed Supply Problems*

The likely availability of seed from Australian sources is indicated by the following numbers :

1) Considerable supplies of seed could be organised in good seed years at the site of commercial fellings, and obtained at a moderate price.

2) Species fairly accessible but only limited quantities cut commercially. To obtain supplies of seed it is necessary to watch for good seed years and to make arrangements for collection. Supply will require more time and involve greater cost than (1), and quantities obtainable may be limited.

3) Species rarely cut commercially. Collection demands careful location of suitable trees and will be expensive. Very limited supplies only can be anticipated.

4) Species occurs in remote localities. Collection of seed entails costly observation and considerable travel. Supply severely limited.

N.B. Seed supply problems for any species may vary with each locality of occurrence.

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude Feet	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F Heat				Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
ZONE 1 Mean Annual Temperature 45-50° F. (7.2-10° C.): Mean Annual Rainfall more than 40 inches (1016 m.m.)																
N.L.	Fastigata	150-180	35-37½	3000-4000	N.V.	11	70-100	105	5	W-U	15	T-C	20-30	1,3	1	1
	Delegatensis (Gigantea)	150-200	35-43	1000-3000	M.V.	16	70-90	103	3	W	15	T-C	20-30	2,4,9,10	1	1
	Nitens	150-180	35-38	2000-4000	N.V.	13	70-90	105	5	W-U	15	T-C	20-30	3,10	1	3
	Regnans	250	37-43	100-2000	N.V.	19	20-80	103	3	W	15-20	C	20	4,10	1	1
V.L.	Goniocalyx	120-150	36-39	2000-3000	M.V.	15	70-100	105	5	W-U	15-20	C-T	20-30	3,8	1	2
	Obliqua	175-225	36-42	S.L.-2000	M.V.	15	30-100	105	5	W-U	15-25	C	20-30	4,10	1,3	1
	Viminalis	150-180	35-43½	1000-2000	V.V.	15	20-80	103	3	W	15	C-T	20-30	1,5	1	2
M.V.L.	Dalrympleana	100-120	35-42½	1000-4500	V.V.	11	50-100	105	5	W	15-25	T	20	1,3,13	1	2-3
	Robertsoni	80-100	35-37	2000-4000	V.V.	12	70-100	105	5	W-U	15-20	T	20-30	1,3,5,8,9	1.5	2
W.L.	Coccifera	5-70	42-43	2500-4000	V.V.	0-5	100-150	95	0	W	15	C-T	20	3,11,13	7	2
	Pauciflora	30-70	35-43	1000-5500	M.V.	5	100-150	100	1	W	15	T-C	20-30	3,11,13	3,9	2
W.L.-MALL.	Niphophila	5-40	35-38	5000-6500	M.V.	0	150	95	0	W-U	20	T	20-30	3,11,13	3.9	2
ZONE 2 Mean Annual Temperature 45-50° F. (7.2-10° C.): Mean Annual Rainfall 25-40 inches. (635-1016 m.m.)																
N.L.	Fastigata	120	35-37½	3000-4000	N.V.	11	70-100	105	5	W-U	15	T	30-40	1,3	1	1
V.L.	Obliqua	150	36-43½	S.L.-2000	M.V.	15	30-100	105	5	W-U	15-25	C-T	20-40	4	1.3	1-2

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F Heat				Rainfall type		Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
M.V.L.	Dalrympleana	100	35-42½	2000-4500	V.V.	11	70-100	105	5	W-U	15-25	T	20-30	1,3,13	1	2-3
	Robertsoni	70-90	35-37	2000-4000	V.V.	12	70-100	105	5	W-U	20-25	T	20-40	1.3.5,8,9	1,5	2
W.L.	Coccifera	5-50	42-43	2500-4000	V.V.	0-5	100-150	95	0	W	15	C-T	20	3,11,13	7	2
	Pauciflora	30-60	35-43	100-4000	V.V.	5	100-150	100	1	W	15-20	C-T	20-30	3,11,13	3,9	2
	Dives	40-70	32-38	2500-4000	V.V.	11	70-100	105	5	W	15-25	T	30-40	3,11	5	2
ZONE 3 Mean Annual Temperature 50-60° F. (10.15.5° C.): Mean Annual Rainfall more than 40 inches (1016 m.m.)																
N.L.	Delegatensis (Gigantea)	120-180	35-38	3000-4500	M.V.	18	50-70	103	3	W-U	20	T-C	20-30	4,10	1	1
	Diversicolor	200-225	34-35	S.L.-1000	N.V.	27	1	105	5	W	15-20	C	30-40	2,4	1,2	1
	Fastigata	150	30-35	3500-4000	N.V.	15	50-90	108	5	U	25	T	20-30	1,3	1	1-2
	Jacksoni	150-180	34½-35	S.L.-600	M.V.	32	0	105	5	W	15-20	C	30-40	2,4	1	3
	Nitens	150-180	35-38	3000-4000	N.V.	15	50-70	105	5	U	15	T-C	20-30	3,10	1	3
	Regnans	2-50	37-38½	500-3000	N.V.	19	20-50	110	5	W	15-20	C-T	20-30	4,10	1	1
V.L.	Bicostata	100-140	35-39	S.L.-3000	M.V.	15	10-50	110	5-8	W-U	15-25	C-T	30-40	1,3,5	1,3	3
	Globulus	150-180	39-43½	S.L.-1500	M.V.	23	10-20	105	5	W	15-20	C	20-30	1,3,5	1,2,3,7	1
	Goniocalyx	120-150	32-39	500-4000	M.V.	18	20-50	110	8	W-U-S	20-25	C-T	30-40	3,8	1	2
	Guilfoylei	80-120	34½-35	S.L.-600	M.V.	32	0	105	5	W	15-20	C	30-40	4	1,3	3

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
V.L.	Maideni	120-150	32-38	500-3000	M.V.	15	20-50	110	8	W-U	15-20	C	30-40	1,3	1	3
	Obliqua	150-200	33-38½	S.L.-3000	M.V.	20	10-50	110	5-8	W-U-S	20-30	C-T	30-40	4,10	1,3	1-2
	Ovata	120-150	40½-41½	100-1000	M.V.	25	5-10	100	1	W	15-20	C	20	1,6	1	3
	Sieberiana	100-120	33-35	S.L.-1000	N.V.	30	0-5	110	3	U	15-25	C	40	4,8,11	1,3	2
	Viminalis	120-150	33-43½	1000-4000	V.V.	12	50-90	110	8	W-U	15-25	T-C	20-40	1,5	1	2-3
M.V.L.	Blaxlandi	80-100	33½-34½	1000-3500	M.V.	18	40	108	5	U	20	T-C	40	4,8,11	1	3
	Calophylla	100-150	32½-35	S.L.-1000	M.V.	26	11	110	8	W	20	C-INT	40-60	2,4	1,3	1
	Dalrympleana	80-110	33-34½	1000-4500	V.V.	15	20-90	108	8	W-U	20-25	T	20-40	1,3	1	2-3
	Huberiana	80-100	33-39	1000-4000	V.V.	12	20-70	110	8	W-U	15-25	T-C	20-40	1,5	1	3
	Laevopinea	90-120	29-34	2500-4000	M.V.	25	20	105	5	S-U	25-30	T-C	40-50	4,9	1,3	3
	Marginata	100-130	32½-35	S.L.-1000	M.V.	26	11	110	8	W	20	C-INT	40-60	4,8,11	1,2,3	1
	Patens	80-100	32½-35	S.L.-1000	N.V.	26	11	110	8	W	20	C-INT	40-60	4	1,2,3	2
	Radiata	80-100	35-37	300-4000	V.V.	18	10-40	108	6	W-U	20-25	C-T	30-40	1,3,5	1,5	2
	Robertsoni	80-100	35-37	2000-4000	V.V.	15	50-90	108	8	U	20-25	T	20-30	1,3,5,8,9	1,5	2
	Rubida	80-100	33-36½	3000-4000	V.V.	12	20-100	105	5	W	15-20	T	20-40	1,3,5	7	3
W.L.	Cornuta	50-70	33½-35	S.L.-1000	N.V.	32	0	105	5	W	15	C	40	2,4,5	4	2
	Dives	40-80	32-38	2000-4000	V.V.	12	70-110	105	5	W-U	15-20	T	30-40	3,11	5	2
	Ficifolia	20-35	34½-35	S.L.-500	M.V.	32	0	105	5	W	15	C	40	2,4	7	3
	Salicifolia	80-100	41-43½	S.L.-2000	V.V.	20	20-30	100	1	W	15	C-T	20	3,11	5,7	3

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F Heat				Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Days > 100°	Abs. Max.	Distribution	Reliability					
ZONE 4 Mean Annual Temperature 50-60° F. (10-15.5° C.): Mean Annual Rainfall 25-40 inches (635-1016 m.m.)																
N.L.	Camaldulensis	80-100	33-38	100-500	M.V.	24	10-15	110	5-10	W	15-25	C-INT	30-40	6,7	1,2,3	2
	Fastigata	100-120	30-35	3500-4000	N.V.	15	50-90	108	5	U	25	T	40-50	1,3	1	1
	Nitens	120-150	35-38	3000-4000	N.V.	13	70-90	105	5	U	15-20	T-C	20-30	3	1	3
	Pilularis	100-150	36½-37½	S.L.-1000	M.V.	25	6-8	112	3-5	W-U	15	C	30	2,4,8	1,2,3	2
	Regnans	175-200	37-38½	500-3000	N.V.	19	20-50	110	5	W	15-20	C-T	20-30	4	1	1
V.L.	Bicostata	90-120	30-39	500-3500	M.V.	15	20-50	110	8	W-U-S	20-25	T	40-50	1,3,5	1,3,7	3
	Campanulata	80-120	28-32	2000-4000	M.V.	14	50-60	107	8	S-U	30	T	40-50	4	1	3
	Globulus	100-150	39-43½	S.L.-1000	M.V.	20	10-20	102	3	W	15-20	C	20-30	2,4,5	1,2,3,7	1
	Maideni	100-120	32-38	500-3000	M.V.	18	10-40	110	8	W-U	15-20	C	30-40	1,3	1	3
	Muelleriana	100-130	34-39	100-2000	M.V.	25	6-8	112	3-5	W-U	15-20	C	30-40	4,5	1,3	2
	Obliqua	90-120	29-38½	S.L.-4000	M.V.	20	10-50	115	5-8	W-U-S	20-25	C-T	30-50	4,9	1,3	1
	Ovata	60-100	33-43½	S.L.-2500	M.V.	15	20-50	110	3-5	W-U	15-20	C-T	20-40	5	3	3
	Sieberiana	100-120	33-42	S.L.-3500	M.V.	20	20-30	110	3-5	W-U	15-20	C-T	30-40	4,8,11	1	2
	Viminalis	100-120	29-43½	S.L.-4500	V.V.	15	20-70	115	8	W-U-S	25-30	C-T	30-50	1,5	1	2
M.V.L.	Andreana	50-120	34-38½	100-2250	M.V.	20	10-40	110	3-5	U-W	15-20	C-T	30-40	5	5	3
	Andrewsi	80-100	28½-31½	1500-3000	M.V.	14	50-60	107	8	S-U	30	T	40-50	4	1	3
	Agglomerata	50-100	33-36	200-3000	V.V.	18	10-40	115	3-5	U	20	C-T	40	8,9	1,3	3

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporations.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
M.V.L.	Blaxlandi	80	33½-34½	1000-3500	M.V.	18	40	108	5	U	20	T-C	40	4,8,11	1	3
	Bosistoana	100-120	33½-38½	S.L.-1600	M.V.	19	30-50	115	3	W-U	15-20	C	30-40	5	1,2,3	3
	Botryoides	100-120	35-38½	S.L.-1000	M.V.	19	30-50	115	3	W-U	15-20	C	30-40	5.8.12	1,2,3	2
	Calophylla	100-120	32½-35	S.L.-1000	M.V.	26	11	110	8	W	20	C	40-60	2,4	1.3	1
	Consideniana	80-100	33½-38½	100-2500	M.V.	20	20-40	112	3-5	W-U	15-20	C	30-40	4,11	1,2,3	3
	Dalrympleana	100	33-42½	1000-4500	V.V.	15	20-90	108	8	W-U	20-25	T	20-40	1,3.13	1	2-3
	Globoidea	80-100	32-37	S.L.-3500	V.V.	25	10-15	108	3-5	U-W	15-20	C	30-40	4	1	3
	Huberiana	60-100	29-39	S.L.-4500	V.V.	14	20-70	115	8	W-U-S	25-30	T-C	30-50	1,5	1	3
	Laevopinea	70-100	29-34	2000-4000	M.V.	20	20-40	115	10	U-S	25-30	T	40-50	4,9	1,3	3
	Longifolia	90-130	32-37½	100-1000	N.V.	25	7	112	3	U	15-20	C	30-40	1,5	2,3	3
	Macarthuri	60-90	33-34½	2200-3000	N.V.	20	30-40	108	5	U	15-20	C-T	40	5	5	3
	Marginata	80-120	32½-35	S.L.-1000	M.V.	26	11	110	8	W	20	C-INT	40-60	4,8,11	1,2,3	1
	Patens	80-100	32½-35	S.L.-1000	N.V.	26	11	110	8	W	20	C-INT	40-60	4,8,11	1,2,3	2
	Radiata	60-90	30-37	300-4000	V.V.	15	10-50	108	8	W-U-S	20-25	C-T	30-50	1,3,5	1,5	2
	Robertsoni	70-90	32-37	2000-4000	V.V.	15	50-90	108	8	U	20-25	T	20-40	1,3,5,8,9	1,5	2
	Rubida	40-80	29-43	250-4000	V.V.	12	20-100	108	8	W-U-S	15-25	T-C	30-50	1,3,5	7	2
	Scabra	80-100	32-39	S.L.-3500	V.V.	26	10-15	108	3-5	W-U	15-20	C	30-40	4	1,2,3	3
	Tereticornis (Umbellata)	90-120	35-38	S.L.-1200	M.V.	20	10-12	115	3	W-U	15-20	C	20-40	1,5	1,2,3	2

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
W.L.	Albens	40-80	29-38	500-2000	V.V.	12	20-40	110	8-12	W-U-S	15-30	T-INT	30-50	1,3,5	2,3	3
	Baxteri	50-100	34-38½	100-1500	M.V.	23	5-15	112	5-8	W	15-25	C-INT	30-50	8,11	3	3
	Blakelyi	50-70	38½-37	1000-3500	M.V.	14	20-50	110	3-5	W-U	20-30	T	30-40	3,5	3	2-3
	Cornuta	20-50	33½-35	S.L.-1000	N.V.	32	0	109	3-5	W	15-20	C-INT	40	2,4,5	4	2
	Dives	20-50	32-35	500-4000	V.V.	15	20-90	108	8	W-U	20-25	T	40-50	3,11	5	2
	Elaeophora	30-50	30-38	500-3000	V.V.	16	50-70	112	5-8	W-U	15-25	T	30-50	3	—	2
	Leucoxylon	60-90	34½-38	1000-1500	M.V.	23	5-20	110	8	W	15-25	C-INT	30-40	1,3	2,3	3
	Macrorrhyncha	80-100	30-38	500-2500	M.V.	20	5-40	108	5-8	W-U	15-30	T-C	30-40	3,11	3	2
	Maculosa	50-70	33-37½	250-3500	V.V.	12	40-60	108	5-8	W-U	15-30	T	30-40	3,11	7	2
	Melliodora	60-100	29-38	500-4000	V.V.	12	40-60	108	5-8	W-U	15-30	T-C	30-40	1,3,5,7	3	2-3
	Nicholi	50-80	28-31	2000-4500	M.V.	14	30-50	105	3-5	U-S	20-30	T	40-50	3,11	7,8	3
	Pauciflora	20-50	29-43½	500-5000	V.V.	8	50-90	105	5	W-U	20-30	T	30-50	3,11,13	3,8	2
	Polyanthemos	50-80	32-38	400-2000	M.V.	12	40-60	108	5-8	W-U	15-30	T-C	30-40	1,3,5,11	3,7,8	2
	Rossii	30-70	29½-36½	1000-3000	M.V.	14	40-60	110	3-5	W-U	15-30	T	30-40	3,11	1	2
	Salicifolia	70-90	41-43½	S.L.-2000	V.V.	20	20-30	101	2	W	15-20	C-T	20-30	3,11	5,7	3
	Sideroxylon	70-100	29-38	100-1000	M.V.	20-25	5-30	108	3-5	W-U	15-30	C-INT	30-40	3,8,11	2,3,7	2-3
	Stuartiana	40-70	29-38	500-3500	V.V.	15-25	5-40	110	3-5	W-U	15-30	T-C	30-40	1,3,5	8	2

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
ZONE 5 Mean Annual Temperature 50-60° F. (10-15.5° C.): Mean Annual Rainfall 15-25 inches																
N.L.	Astringens	30-80	33-34	900-1200	N.V.	24	20	112	8	W	20-25	INT	50-70	4,8,11	4,6	2
	Camaldulensis	80-100*	29-38	100-1500	V.V.	23	10-15	112	8	W	15-35	INT	30-70	6,7	1,2,3	1-3
M.V.L.	Cladocalyx	30-100	32-36	100-2000	M.V.	22-30	0-15	119	5-8	W	20-30	C-INT	40-70	4,7,8,11	1,3,8	3
	Ovata	20-50	33-43½	S.L.-2000	M.V.	23	10-15	112	5-8	W-U	15-20	C-T	30-50	6	3	3
	Viminalis	50-80	29-43	100-3500	V.V.	12	50-90	110	5-8	W-U-S	15-30	C-T	30-50	1,3,5	1	2
W.L.	Albens	30-70	31-38	500-2000	V.V.	18	10-30	115	10-20	W-U-S	20-30	T-INT	30-60	1,3,5	2,3	3
	Blakelyi	50-70	32-36½	500-2500	M.V.	14	20-50	110	5-8	W-U	20-30	T-INT	30-60	3,5	3	2-3
	Dives	20-50	30-35	2000-4000	V.V.	12	70-100	108	8	W-U	20-25	T	40-50	3,11	5	2
	Elaeophora	30-50	33-38	500-2000	V.V.	20	5-20	114	5-8	W-U	15-25	T-INT	30-60	3,11	—	2-3
	Fasciculosa	30-70	34-37	100-1500	M.V.	21	5-15	120	3-10	W	15-25	C-INT	40-50	3,8,11	3	3
	Leucoxylon	50-70	31½-38	500-1500	M.V.	21	5-15	120	5-8	W	20-25	C-INT	30-50	1,3	2,3,7	3
	Macrorrhyncha	50-80	30-38	500-2500	M.V.	18	20-40	115	8	W-U	15-30	T	30-60	3,11	3,5	2
	Maculosa	30-60	33-37½	250-3500	M.V.	14	20-50	110	5-8	W-U	15-30	T	30-50	3,11	7	2
	Melliodora	50-80	31-38	500-3000	V.V.	14	20-50	110	5-8	W-U	15-30	T-INT	30-60	1,3,5,7	3,8	2-3
	Microcarpa	40-60	33-38	400-1500	V.V.	21	5-25	120	5-10	W-U	20-30	T-INT	30-60	1,5	3	2-3
	Pauciflora	20-50	29-43½	500-4000	V.V.	11	40-80	105	5	W-U	20-30	T-C	30-50	3,11,13	3,8	2

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporations			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
W.L.	Polyanthemos	40-60	32-38	400-2000	M.V.	14	20-50	110	5-8	W-U	15-25	T-INT	30-60	1,3,5,11	3,7,8	2-3
	Rossii	30-60	29½-36½	1000-3000	M.V.	14	40-60	110	5-8	W-U	15-30	T	30-50	3,11	—	2-3
	Salicifolia	50-80	41-43½	S.L.-2000	V.V.	18	30-40	105	3	W	20-25	C-T	20-30	3,11	5,7	2-3
	Sideroxylon	50-80	29-37	500-1500	M.V.	21	10-30	120	5-10	W-U	20-30	INT	40-60	3,8,11	2,3,7	2-3
	Stuartiana	40-70	29-38	1000-2500	V.V.	14	14-60	110	5-8	W-U	15-30	T	30-60	1,3,5	8	2
	Wandoo	50-80	32½-34½	200-1000	M.V.	24	10-20	112	8	W	20	C-INT	40-70	3,8,11	1,2,3,6	2
W.L.-MALL.	Behriana	10-30	35-36½	100-1250	M.V.	23	5-10	113	8-12	W	20-25	INT	30-50	8,11,14	8	3
	Fruticetorum	10-20	35-37	100-1250	M.V.	23	5-10	113	8 12	W	20-25	INT	30-60	8,11,14	5,8	3
ZONE 6 Mean Annual Temperature 50-60° F. (10-15.5° C.): Mean Annual Rainfall 8-15 inches (203-381 m.m.)																
W.L.-MALL.	Behriana	6-10	35½-36	300-500	M.V.	23	30	117	8-12	W	20-25	INT	30-50	8,11,14	8	3
	Fruticetorum	10-15	35½-36	300-500	M.V.	23	30	117	8-12	W	20-25	INT	30-50	8,11,14	5,8	3
ZONE 7 Mean Annual Temperature 60-70° F. (15.5-21.1° C.): Mean Annual Rainfall more than 40 inches (1016m.m.)																
N.L.	Cloeziana	130-150	16-26½	100-3000	V.V.	23	1-5	112	2-5	S	30-35	C-T	50	1,3,10,11	1,2,3	2
	Diversicolor	200-225	34-35	S.L.-1000	N.V.	29	1	106	5	W	15-20	C	30-40	2,4	1,2	1
	Grandis	140-180	17-32½	S.L.-2500	M.V.	23	1-5	114	2-3	S	20-30	C	40-50	1,5,9,10	1	1
	Jacksoni	150-180	34½-35	S.L.-600	M.V.	35	0	106	5	W	15-20	C	30-40	2,4	1	3
	Pilularis	120-180	25-35	S.L.-2000	M.V.	23	1-15	114	2-3	S-U	15-30	C	40-50	4,8,10	1,2,3	1

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Max.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
W.L.	Resinifera	100-150	26-34	S.L.-2000	M.V.	23	5	114	3	S	20-30	C	40-50	2,4,8	1,2	2
	Saligna	130-150	26-36	S.L.-4000	M.V.	25	1-10	114	2-3	S-U	15-30	C	40-50	1,3,10	1,2	1
M.V.L.	Blaxlandi	80-100	33½-34½	500-1500	M.V.	28	10	115	5	U	20	T-C	40	4,8,11	1	3
	Botryoides	100-120	32-35	S.L.-500	N.V.	32	0	113	2	U-S	20-25	C	40	5,8,12	1,2,8	2
	Calophylla	100-150	31½-35	S.L.-1000	M.V.	32	0	110	8	W	20	C	40-70	2,4	1,3	1
	Capitellata	60-80	32½-34½	S.L.-1000	M.V.	32	0	113	2-3	U-S	20	C	30-40	8,11	1,3	3
	Citriodora	80-130	15½-25	S.L.-2000	M.V.	26	2-5	107	3-5	S	30-35	C	50-60	3,8,11	1,3,5	2
	Drepanophylla	80-120	23½-27	S.L.-2000	M.V.	26	2-5	107	3-5	S	30-35	C	50	1,3	2,3	3
	Ficifolia	20-40	34½-35	S.L.-500	M.V.	32	0	105	5	W	20	C	40	2,4	7	3
	Globoidea	80-120	30-35	S.L.-2000	V.V.	26	5-10	115	3-5	S-U	20-30	C	40	4	1,2,3	3
	Gummifera	90-120	26-36	S.L.-2000	M.V.	25	2-5	115	3-5	S-U	20-30	C	40-50	4,8,11	3	2
	Intermedia	80-100	26-36	S.L.-1000	M.V.	25	2-5	115	3-5	S-U	20-30	C	40-50	4,8,11	3	3
	Maculata	90-150	25-35	S.L.-1500	V.V.	25	2-5	115	3-5	S-U	20-30	C	40-60	3,8	1,2,3	1
	Marginata	100-150	31½-35	S.L.-1000	M.V.	32	0	110	8	W	20	C	40-70	4,8,11	1,2,3	1
	Microcorys	100-150	25-32½	S.L.-2500	N.V.	23	1-5	114	2-3	S	20-30	C	40-50	4,8,10	1,2,3	1
	Paniculata	80-120	29-35	S.L.-1500	M.V.	25	2-5	115	3-5	S-U	20-30	C	40-50	1,3,11	1,2,3	2
	Patens	70-90	31½-35	S.L.-1000	N.V.	32	0	110	8	W	20	C	40-70	4	1,2,3	2
	Pellita	80-100	16-35	S.L.-2500	M.V.	25	2-5	115	3-5	S-U	20-35	C	30-60	4,10	1,2	3
	Phaeotricha	80-100	16-28	200-3000	M.V.	23	1-5	114	3-5	S	25-35	C	40-60	4	1	3

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
M.V.L.	Propingua	100-130	24-33	S.L.-1000	M.V.	23	1-5	114	3-5	S	20-30	C	40-50	3,10	1,2,3	2
	Punctata	80-110	24-35	S.L.-1500	M.V.	23	1-5	114	3-5	S-U	20-30	C	40-50	3,11	1,2,3	2
	Scabra	80-120	30-35	S.L.-2000	V.V.	26	5-10	115	3-5	S-U	20-30	C	40	4	1,2,3	3
	Siderophloia	60-100	24½-35	S.L.-1500	V.V.	23	1-5	114	3-5	S-U	20-30	C	40-50	1.8	1.2.3	2
	Triantha	100-130	16-33	100-3000	M.V.	23	1-5	114	3-5	S	20-35	C-T	40-50	4	1,2,3	2
	Tereticornis (Umbellata)	100-150	25-36	S.L.-2500	M.V.	23	3-5	112	3	U-S	20-30	C-T	40-50	1,5	1,2,3	2
W.L.	Cornuta	50-70	33½-35	S.L.-1000	N.V.	29	1	112	5	W	20	C	30-40	2,4,5	4	2
	Haemastoma	40-70	31½-35	S.L.-2000	M.V.	23	1-10	114	2-3	U	20-30	C	40	1,3,8,11	1	3
	Micrantha	40-70	25-36	S.L.-2000	M.V.	23	1-10	114	2-3	S-U	20-30	C	40	1,3,8,11	1	3
	Piperita	60-100	32-36	100-3000	M.V.	25	5-10	114	2-3	U	20-25	C	40	4,8,11	3	3
	Robusta	80-90	25-36	S.L.-500	N.V.	25	5	112	3	S-U	20-30	C	40-50	1,6,7,8,12	1,2,3,8	2
	Tessellaris	80-100	25-29	S.L.-1000	V.V.	23	1-5	112	3	S	30-35	C	40-50	1,5,8	7	3
ZONE 8 Mean Annual Temperature 60-70° F. (15.5-21.1° C.): Mean Annual Rainfall 25-40 inches (635-1016 m.m.)																
N.L.	Gomphocephala	80-130	31½-34	S.L.-100	N.V.	30	0-2	112	6	W	20-25	C	40-70	2,8	1	2
	Pilularis	100-150	34-36½	S.L.-1000	M.V.	20	5-15	115	3	U	15-20	C	30-40	2,4,8	1,2,3	2
M.V.L.	Blaxlandi	80	33½-34½	500-1500	M.V.	28	10	115	5	U	20	T-C	40	4,8,11	1	3

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F Heat				Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
	Botryoides	80-100	32-35	S.L.-500	N.V.	27	4	113	2-3	U	20-25	C	40	5,8,12	1,2,8	2
	Calophylla	100-120	31½-35	S.L.-1000	M.V.	30	0	110	8	W	20	C	60-70	2,4	1,3	1
	Capitellata	50-70	33-36½	S.L.-1500	M.V.	27	4	113	2-3	U-S	20	C	30-40	8,11	1,3	3
	Citriodora	80-100	15½-25	S.L.-2000	M.V.	25	2-10	110	3-5	S	30-35	T-C	50-60	3,8,11	1,3,5	2
	Drepanophylia	60-100	23½-27	S.L.-1500	V.V.	20-30	0-20	114	5-8	S	30-35	C-T	50-70	1,3	2,3	3
	Globoidea	80-100	32-37	S.L.-3500	V.V.	26	5-10	115	5	W-U-S	15-20	C	30-40	4	1,2,3	2
	Gummifera	80-100	36-37½	S.L.-1000	M.V.	20	5-20	113	2-3	W-U	15-20	C	30-40	4,8,11	3	2-3
	Intermedia	70-90	26-30	S.L.-1500	M.V.	20	5-20	114	3-5	S	30-35	C-T	50-60	4,8	3	3
	Maculata	80-120	25-37	S.L.-2000	V.V.	20	5-20	114	3-5	S-U	15-35	C-T	30-60	3,8	1,2,3	2
M.V.L.	Marginata	80-100	31½-35	S.L.-1000	M.V.	30	0-2	110	8	W	20-25	C-T	60-70	4,8,11	1,2,3	1-2
	Paniculata	60-100	35-37	S.L.-1500	M.V.	20	5-10	115	5	U-W	15-20	C	30-40	1,3,11	1,2,3	2
	Patens	60-90	31½-35	S.L.-1000	N.V.	32	0	110	8	W	20	C	60-70	4	1,2,3	2-3
	Pellita	60-90	35-36	S.L.-1000	M.V.	25	2-5	115	3-5	U	15-20	C	30-40	4,11	1,2	3
	Propinqua	80-100	24-33	S.L.-1000	M.V.	25	2-8	115	3-5	S	20-30	C	40-50	3	1,2,3	2
	Punctata	70-90	24-35	500-2000	M.V.	20	5-20	115	3-5	S-U	20-30	C-T	50	3,11	1,2,3	2
	Scabra	80-100	32-38	S.L.-3500	V.V.	26	5-10	115	5	W-U-S	15-20	C	30-40	4	1,2,3	3
	Siderophloia	60-80	25-36	S.L.-2000	V.V.	24	8-15	115	3-5	S-U	15-30	C-T	40-50	1,5,8	1,2,3	2-3
	Tereticornis (Umbellata)	90-120	25-36	S.L.-1200	M.V.	20-30	5-20	112	5	S-U	30-35	C-T	50-60	1,5	1,2,3	2-3
	Triantha	80-100	16-33	100-3000	M.V.	20-30	1-20	114	5-8	S	20-35	C-T	40-60	4	1,2,3	2-3

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F Heat				Rainfall type		Air Humidity	Evaporations.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
W.L.	Albens	40-80	26-36	500-2000	V.V.	14	20-40	110	8-12	W-U-S	15-30	T-INT	30-50	1,3,5	2,3	3
	Blakelyi	50-70	29-33	500-2500	M.V.	20	15-30	115	5-8	U-S	20-30	T	30-40	3,5	3	2-3
	Crebra (Racemosa)	60-90	17-34½	S.L.-1500	V.V.	20-30	1-20	114	3-8	S-U	25-35	C-INT	40-60	3,8	2,3	1-3
	Haemastoma	30-60	31½-35	S.L.-2000	M.V.	20	20-40	116	3-5	U	20-30	C	40	1,3,8,11	1	3
	Hemiphloia	70-90	25-35	S.L.-1500	M.V.	17-25	5-30	115	5-8	S-U	20-30	C-T	40-50	1,5	1,2,3	2
	Macrorrhyncha	70-90	29½-34	1000-3000	M.V.	14	20-40	110	5-8	S-U	20-30	T	30-40	3,11	3	2
	Melliodora	60-80	26½-38	500-2000	V.V.	14	20-40	110	5-8	U-S	20-30	T	30-50	1,3,5,7,8	3,8	2-3
	Micrantha	30-60	25-36	S.L.-2000	M.V.	25	5-10	116	3-5	S-U	20-30	C	40	1,3,8,11	1	3
	Piperita	50-80	32-36	100-2000	M.V.	18	10-40	116	3-5	U	20-25	C-T	40	4,8	1	2-3
	Polyanthemos	50-80	32-32½	400-1000	M.V.	20	15-40	115	3-5	U	25	T-C	40	1,3,5,11	3,7,8	3
	Rudis	30-70	30-35	100-800	M.V.	25	5-8	115	5	W	20-25	C-T	40-70	6	3	3
	Stuartiana	40-70	28½-38	1000-3000	V.V.	14	20-40	110	5-8	U-S	20-30	T	30-50	1,3,5	8	2
	Tessellaris	70-90	24-29	100-1500	V.V.	20-30	2-20	114	5-8	S	30-35	C-T	40-60	1,5,8	7	3
	Trachyphloia	60-80	24-32	S.L.-1000	M.V.	20-30	1-20	114	3-8	S	25-35	C-T	40-60	4,8	2,3	2-3
ZONE 9 Mean Annual Temperature 60-70° F. (15.5-21.1° C.): Mean Annual Rainfall 15-25 inches (381-635 m.m.)																
N.L.	Astringens	30-60	32½-34	900-1200	N.V.	23	20	117	6-12	W	20-25	INT	50-80	4,8,11	4,6	2
	Camaldulensis	80-120*	27-36	300-1500	M.V.	24	5-10	124	20-40	W-U-S	25-40	INT	50-80	6,7,14	1,2,3	1-3

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Pests problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
M.V.L.	Cladocalyx	30-100	33½-34½	100-1000	M.V.	25	0-5	119	5-8	W	25-30	C-INT	60-70	4,7,8,11	3,8	3
W.L.	Albens	30-70	26-36	500-2000	V.V.	18	10-30	115	10-20	W-U	20-30	T-INT	30-60	1,3,5	2,3	3
	Blakelyi	50-70	30½-33	1000-2500	M.V.	18	20-40	115	5-8	U	20-30	T-INT	40-50	3,5	3	2-3
	Crebra (Racemosa)	50-80	24-32	600-1500	V.V.	20	20-40	116	8-10	S-U	30-35	T-INT	50-70	3,8	1,3	1
	Elaeophora	25-40	30-36	S.L.-2000	V.V.	19	2-20	117	5-8	W-U-S	20-30	C-INT	40-60	3,11	—	3
	Leucoxylon	50-70	31½-35	S.L.-1500	M.V.	25	5-10	117	5-8	W	20-30	C-INT	40-60	1,3	2,3,7	3
	Longicornis	60-80	28-34½	800-1200	N.V.	27	5-8	112	5-8	W	20	T-INT	40-70	14	1,3	3
	Macrorrhyncha	50-80	29½-34	1000-3000	M.V.	18	20-40	117	5-8	U-S	25-30	T	40-60	3,11	3,5	2
	Melanophloia	40-60	24-33	500-2000	V.V.	20	30-40	116	8-10	S	30-35	T-INT	50-60	3,8,11,14	3	3
	Melliodora	50-60	26½-36½	500-2000	V.V.	18	20-40	115	5-8	U-S	25-30	T-INT	40-60	1,3,5,7,8	3,8	2-3
	Microcarpa	40-60	28½-36	400-1200	V.V.	21	5-20	120	8-10	W-U-S	20-30	T-INT	40-60	1,5	3	2-3
	Polyanthemos	40-60	32-34	400-1000	M.V.	20	20-40	115	5-8	U-W	20-30	T-INT	40-60	1,3,5,11	3,7,8	2
	Populifolia	30-60	24-36	500-1500	M.V.	19	10-15	120	10-20	S-U	20-40	INT	40-80	1,5	3,7	3
	Rossii	30-50	29½-36½	750-2000	M.V.	20	20-40	115	8-10	U-S	25-30	T-INT	40-60	3,11	1	2-3
	Rudis	30-60	25-32	100-800	M.V.	25	5-8	115	5-8	W	20-30	C-T	70-90	6	3	3
	Salmonophloia	70-90	30-34½	900-1300	N.V.	27-30	1-5	111	8-10	W	20-25	T-INT	50-70	1,8	1,2,3	2-3
	Salubris	60-80	30-34½	900-1200	N.V.	27-30	1-5	111	8-10	W	20-25	T	50-70	1,8	3,7	2-3

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporations			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
W.L.	Siderophloia	50-70	30-32	1000-1500	V.V.	20	30-40	116	8-10	S	30	T-INT	50-60	1,5,8	1,2,3	3
	Sideroxylon	50-80	25-36	500-1750	M.V.	20	10-20	120	8-10	W-U-S	25-30	INT	40-60	3,8,11	2,3,7	2-3
	Tessellaris	50-70	24-30	500-1500	V.V.	20	10-20	116	8-10	S	30-35	T-INT	50-70	1,5,8	7	3
	Trachyphloia	50-70	24-32	500-1000	M.V.	20	30-40	116	8-10	S	25-35	T-INT	50-60	4,8	2,3	3
	Wandoo	40-70	31-34½	200-1000	M.V.	24	10-20	115	6-12	W	20-25	C-INT	40-70	3,8,11	1,2,3,6	2-3
	Woollsiana	30-60	30-36	250-1000	V.V.	20	10-20	120	8-15	S-U-W	25-35	INT	50-70	5	3	3
W.L.-MALL.	Behriana	10-25	31-36½	100-1250	M.V.	23	5-10	116	8-12	W-IRR	20-30	INT	40-60	8,11,14	8	3
	Dumosa	10-25	31-36½	100-1250	M.V.	21	5-10	116	8-10	W-IRR	20-30	INT	30-60	8,11,14	8	3
	Fruticetorum	10-20	32-37	100-1250	M.V.	23	5-10	116	8-10	W-IRR	20-30	INT	40-60	8,11,14	5,8	3
	Gracilis	15-30	30-36	100-1000	M.V.	21	5-10	116	8-10	W-IRR	20-30	INT	30-60	8,11,14	8	3
	Viridis	15-30	28-36½	100-1400	M.V.	20	5-12	116	8-10	W-IRR	20-35	INT	30-70	8,11,14	5,8	3
ZONE 10 Mean Annual Temperature 60-70° F. (15.5-21.1° C.): Mean Annual Rainfall 8-15 inches (203-381 m.m.)																
N.L.	Camaldulensis	40-100*	20-36	100-2000	V.V.	25-30	1-10	120	8-30	IRR-S	30-40	INT	50-100	6,7,14	1,2,3	1-4
W.L.	Bicolor	30-60	28½-35	100-1000	V.V.	23	1-5	124	10-40	IRR	30-45	INT	60-100	5,7,14	3,8	2-4
	Brockwayi	50-80	31-33	600-1400	N.V.	24	2-15	110	10-12	W-IRR	25	INT	60-80	7,8,14	3,6,8	2-3
	Coolibah	30-60	28-35	500-1000	V.V.	23	1-5	124	10-40	IRR	30-45	INT	60-100	5,14	3,8	4
	Dundasi	10-60	29-33	750-1250	N.V.	24	2-15	110	10-12	IRR-W	25	INT	60-80	7,14	3,7,8	3

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporations.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
W.L.	Longicornis	40-60	28-34½	800-1200	N.V.	28	1-5	115	12-18	IRR-W	20-25	T-INT	60-90	14	1,3	3
	Salmonophloia	50-80	30-34½	900-1300	N.V.	23	1-12	117	10-15	IRR-W	20-30	INT	70-100	1,8	1,2,3	2
	Salubris	40-60	30-34½	900-1200	N.V.	23	1-12	117	10-15	IRR-W	20-30	INT	70-100	1,8	3,7	2-3
	Torquata	10-30	30-33	600-1400	N.V.	24	2-15	117	10-15	IRR-W	20-25	INT	60-90	14	7	3
W.L.-MALL.	Behriana	6-10	31-36½	100-1250	M.V.	24	5-12	124	12	IRR-W	20-30	INT	40-60	8,11,14	8	3
	Dumosa	8-15	31-36½	100-1250	M.V.	24	5-12	124	12	IRR-W	20-30	INT	30-60	8,11,14	8	3
	Flocktoniae	10-50	30-35	200-1250	M.V.	23	2-15	117	8-12	IRR-W	20-30	INT	30-60	7,8,14	3,7,8	3
	Fruticetorum	10-20	32-37	100-1250	M.V.	24	5-12	124	12	W	20-30	INT	40-60	8,11,14	5,8	3
	Gracilis	6-10	30-36	100-1000	M.V.	24	5-12	124	12	IRR-W	20-30	INT	30-60	7,8,11,14	8	3
	Oleosa	10-50	29-37	100-1500	V.V.	24	2-15	124	10-12	IRR-W	20-35	INT	30-70	8,9,14	3,5,8	2-3
	Oleosa var. Glauca (Transcontinentalis)	10-70	29-35½	500-1300	M.V.	24	5-30	120	10-15	IRR-W	20-40	INT	40-90	7,8,11,14	3,8	3
	Viridis	6-10	28-36½	100-1400	M.V.	24	5-12	124	12	IRR-W	20-35	INT	30-70	8,11,14	5,8	3
ZONE 11 Mean Annual Temperature 70-80° F. (21.1-26.7° C.): Mean Annual Rainfall more than 40 inches (1016 m.m.)																
N.L.	Cloeziana	80-100	16-25	100-1500	V.V.	27-34	0-3	109	3-5	S	30-35	C-T	50-60	2,4,10,11	1,2,3	2-3
M.V.L.	Miniata	50-90	11-16	S.L.-500	M.V.	40	0	105	3-5	M	15-20	C-INT	80-100	8	1	2-3
	Nesophila	50-90	11-12	S.L.-500	M.V.	40	0	105	3	M	15	C	70-80	8	1,3	4

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Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F		Heat		Rainfall type		Air Humidity	Evaporations.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
M.V.L.	Tereticornis (Umbellata)	80-100	15-25	S.L.-3000	M.V.	40	0	110	3	S	30-35	C	50	5	1,2,3	3
	Tetrodonta	50-90	11-16	S.L.-1000	N.V.	40	0	105	3-5	M	15-20	C-INT	80-100	8	1	2-3
	Triantha	100-130	20-25	100-1500	M.V.	30	0-2	108	3-5	S	30-35	C	50-60	5	1,2,3	2-3
W.L.-	Alba	40-60	11-25	S.L.-1400	V.V.	27-30	1-4	110	3-5	M-S	15-35	C-T	50-100	5,11	1,3,6	3-4
	Papuana	40-60	11-23	S.L.-2500	V.V.	27-30	1-4	110	3-5	M-S	15-35	C-T	50-100	5,8,11	1,3	3-4
	Tessellaris	60-90	16-25	100-1000	V.V.	30	0-2	108	3-5	S	30-35	C	50-60	1,5,8	7	3-4
ZONE 12 Mean Annual Temperature 70-80° F. (21.1-26.7° C.): Mean Annual Rainfall 25-40 inches (635-1016 m.m.)																
N.L.	Camaldulensis	30-80 *	13-27	100-1500	V.V.	40	0	112	5-20	M-S	20-35	INT	80-100	6,7	1,2,3	4
M.V.L.	Citriodora	70-90	15½-25	S.L.-1000	M.V.	25	0-8	112	3-5	S	25-35	C-T	50-60	3,8,11	1,3,5	2-3
	Miniata	50-80	14-18	100-1000	M.V.	29	0-2	112	3-8	M	20-25	C-INT	70-100	8	1	2-4
	Tereticornis (Umbellata)	70-90	15-25	S.L.-3000	M.V.	40	0	110	3	S	30-35	C	50-60	5	1.2.3	3
	Tetrodonta	50-80	14-18	S.L.-1000	N.V.	35	0	112	3-8	M	20-25	C-INT	50-100	8	1	2-4
	Triantha	70-90	20-25	100-1500	M.V.	30	0-2	112	3-5	S	30-35	C	50-60	4	1.2.3	3
W.L.	Alba	30-50	14-25	S.L.-1400	V.V.	28	0-4	112	3-5	M-S	15-35	C-INT	50-100	5,11	3,6	3-4
	Crebra (Racemosa)	60-80	17-25	S.L.-1500	V.V.	28	0-4	112	3-5	S	30-35	C-T	50-70	3,8	2,3	2-3

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F Het				Rainfall type		Air Humidity	Evaporations.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
W.L.	Hemiphloia	60-80	23-25	S.L.-1000	M.V.	28	0-4	112	3-5	S	30	C	50	1,5	1,2,3	3-4
	Papuana	30-50	14-23	S.L.-2500	V.V.	28	0-4	112	3-5	M-S	15-35	C-INT	50-100	1,5,8,11	3	3-4
	Siderophloia	60-80	23-25	S.L.-1000	V.V.	28	0-4	112	3-5	S	30-35	C	50-60	1,8	1,2,3	3
	Tessellaris	60-80	16-25	100-1500	V.V.	30	0-2	112	3-5	S	30-35	C-INT	50-70	1,5,8	7	3-4
	Trachyphloia	60-80	23-25	S.L.-1000	M.V.	28	0-4	112	3-5	S	30-35	C-INT	50-60	4,8	2,3	3-4
ZONE 13 Mean Annual Temperature 70-80° F. (21.1-26.7° C.): Mean Annual Rainfall 15-25 inches (381-634 m.m.)																
N.L.	Camaldulensis	30-70 *	15-27	100-1500	V.V.	32	0	127	20-30	M-S	30-40	INT	70-90	5,6,14	2,3	4
W.L.	Alba	20-40	17-23	S.L.-1000	V.V.	32	0	112	5-8	M-S	30-35	C-INT	50-90	5,11	3,6	3-4
	Crebra (Racemosa)	50-70	19-24	600-1500	V.V.	27	5-8	120	8-12	S	35-40	T-INT	70-90	3,8	2,3	3-4
	Melanophloia	40-60	20-26	500-1500	V.V.	23	10-20	118	10-15	S	30-35	T-INT	60-80	3,8,11,14	3	3-4
	Microtheca	30-40	14-22	100-1500	M.V.	30	0-2	116	60-90	M-S	20-30	C-INT	90-110	5,14	3	3-4
	Papuana	20-40	15½-26	S.L.-1000	V.V.	23	10-20	118	10-15	M-S	25-40	C-INT	70-100	5,8,11,14	3	3-4
	Tessellaris	40-70	19-25	500-1500	V.V.	27	5-8	120	8-12	M-S	25-35	T-INT	70-90	1,5,8,14	7	4
	Trachyphloia	50-70	23-24	500-1500	M.V.	27	5-8	120	8-12	S	30-35	T-INT	60-80	4,8	2,3	4
ZONE 14 Mean Annual Temperature 70-80° F. (21.1-26.7° C.): Mean Annual Rainfall 8-15 inches (203-381 m.m.)																
N.L.	Camaldulensis	30-60 *	14-30	100-1000	V.V.	20-32	0-20	120	20-80	IRR-M-S	40-60	INT	80-100	5,6,14	2,3	3-4

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F Het				Rainfall type		Air Humidity	Evaporations.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
W.L.	Papuana	20-30	18-27	100-2500	V.V.	22	12	118	20-90	S	20-50	INT	80-110	5,8,11,14	3	4
	Polycarpa	20-50	16-30	500-2500	V.V.	22	12	118	20-90	S	20-50	INT	80-110	8,11,14	3	4
	Microtheca	20-30	14-22	100-1500	M.V.	35	0	115	20-60	M-S	20-30	C-INT	90-110	5,14	3	3-4
ZONE 15 Mean Annual Temperature over 80° F. (26.7° C.): Mean Annual Rainfall more than 40 inches (1016 m.m.)																
N.L.	Camaldulensis	60-70	11-14	100-1000	M.V.	50	0	110	5-15	M	15-25	C-INT	80-100	5,6	1,2,3	4
	Deglupta	150-200	4-6½	S.L.-1500	N.V.	65	0	100	1	M-S	20	C	50	5,10	1	2
M.V.L.	Miniata	50-90	11-16	S.L.-500	M.V.	40	0	105	3-5	M	15-25	C-INT	80-100	8	1	2
	Nesophila	50-90	11-12	S.L.-300	M.V.	40	0	105	3-5	M	15-25	C	70-80	8	1	4
	Tetrodonta	50-90	11-16	S.L.-500	N.V.	40	0	105	3-5	M	15-25	C-INT	80-100	8	1	2
W.L.	Alba	40-90	11-16	S.L.-500	V.V.	40	0	105	3-5	M	15-25	C-INT	80-100	5	1,3	3-4
	Bleeseri	40-60	11-14	S.L.-500	V.V.	40	0	105	3-5	M	15-25	C-INT	70-100	11	3	3-4
	Papuana	40-60	11-16	S.L.-500	V.V.	45	0	115	5-15	M	15-30	C-INT	80-100	5,8,11	3	3-4
ZONE 16 Mean Annual Temperature over 80° F. (26.7° C.): Mean Annual Rainfall 25-40 inches (635-1016 m.m.)																
N.L.	Camaldulensis	60-70	13-19	100-1000	V.V.	30-40	0-1	116	10-20	M	15-30	C-INT	80-100	6,7	2,3	4
M.V.L.	Miniata	50-70	14-18	S.L.-500	M.V.	30-40	0-1	116	10-20	M	15-30	C-INT	80-100	8	1	2-3

CHARACTERISTIC OF EUCALYPTUS SPECIES

Growth type	Species	Height growth Feet	Range of latitude	Range of altitude Feet	Variability	Temperature tolerance				Moisture tolerance				Edaphic tolerance	Uses	Seed problems
						Cold °F Het				Rainfall type		Air Humidity	Evaporation ins.			
						Abs. Min.	No. frosts	Abs. Max.	Days > 100°	Distribution	Reliability					
M.V.L.	Tetrodonta	50-70	14-18	S.L.-500	N.V.	30-40	0-1	116	10-20	M	15-30	C-INT	80-100	8	1	2-3
W.L.	Alba	20-50	11-18	S.L.-800	V.V.	30-40	0-1	116	10-20	M	15-20	C-INT	80-100	5,11	3,6	3-4
	Bleeseri	20-50	14-16	200-1000	V.V.	30-40	0-1	116	10-20	M	15-20	C-INT	80-100	11	3	3-4
	Microtheca	30-40	12-18	100-1500	M.V.	40	0	115	5-15	M	15-30	C-INT	80-100	5	3	3-4
	Papuana	30-50	14-18	S.L.-800	V.V.	30-40	0-1	116	10-20	M	15-30	C-INT	80-100	5,8,11	3	4
ZONE 17 Mean Annual Temperature over 80° F. (26.7° C.): Mean Annual Rainfall 15-25 inches (381-635 m.m.)																
W.L.	Microtheca	20-30	12-18	100-1500	V.V.	28	0-4	115	50-80	M	30	INT	80-100	5,14	3	4
	Papuana	20-30	16-19	S.L.-1000	V.V.	28	0-4	115	50-80	M	30	INT	80-100	5,8,11,14	3	4
ZONE 18 Mean Annual Temperature over 80° F. (26.7° C.): Mean Annual Rainfall 8-15 inches (203-381 m.m.)																
W.L.	Microtheca	20-30	18-22	500-1500	V.V.	28	4	115	50-80	M-IRR	30-35	INT	80-110	5,14	3	4
	Papuana	20-30	18-22	500-1500	M.V.	28	4	115	50-80	M-IRR	30-35	INT	80-110	11,14	3	4
	Polycarpa	20-30	18-22	500-1500	V.V.	28	4	115	50-80	M-IRR	30-35	INT	80-110	11,14	3	4

L'EUCALYPTUS EN TANT QUE PLANT EXOTIQUE

Résumé

Certaines des habitudes de croissance qui font réussir plusieurs eucalyptus comme plantes exotiques sont discutées. Celles-ci comprennent la capacité de coloniser des terrains découverts sans abri, une croissance hative rapide, la variabilité dans une espèce, et la vigueur du système des racines.

La différence entre les espèces de forte et faible prédominance apicale est indiqué, et la méthode de rendre plus utiles les forêts d'espèces de faible prédominance apicale est décrite.

Des règles sont suggérées pour la sélection d'espèces pouvant s'adapter à différents climats dans d'autres pays que l'Australie, prêtant une attention particulière aux facteurs qui influent sur la santé et la survie.

Les problèmes de fourniture de semences sont examinés et l'on recommande vivement aux pays faisant usage des eucalyptus comme plantes exotiques de développer leurs propres vergers à graines le plus tôt possible.

La possibilité d'améliorer les forêts d'eucalyptus du monde en croissant des individus sélectionnés, est suggérée.

Les dangers des animaux, des insectes et des pestes de champignons sont mentionnés et l'on avertit les pays hors d'Australie de prévenir l'introduction de ces épidémies dans leurs plantations.

La probabilité que des facteurs nutritifs, inhibitifs et pathogéniques influent défavorablement sur les rapports sol-racine dans les forêts australiennes, est mentionnée et l'on avertit que ces facteurs peuvent réduire les rendements dans la seconde rotation et les rotations subséquentes, dans les plantations établies hors de l'Australie.

Comme appendice est presenté un tableau donnant des notes sur le climat du milieu naturel des principaux eucalyptus, ainsi que les indications de leur tolérance climatique et édaphique et la probable disponibilité des fournitures de semences d'Australie.

EL ELCALIPTO COMO PLANTA EXÓTICA

Resumen

Se discuten aquí algunos de los hábitos de crecimiento que hacen del eucalipto una exitosa planta exótica. Se menciona su habilidad de colonizar terrenos desnudos sin abrigos, crecimiento de vegetación rápida, la variabilidad dentro de una especie y el vigor del sistema radical.

Se indica la diferencia entre especies con predominância apical fuerte o débil, y se describe el método de obtener bosques más útiles con las especies que presentan una dominancia apical más débil.

Hay reglas para la selección de especies apropriadas a climas distintos en países fuera de Australia, especialmente en lo que se refiere a los factores que influyen en su sanidad y sobreviviencia. Se discute el problema del abasteci-

miento de semillas y se hace una fuerte recomendación para que los países que usan el eucalipto como exóticos establezan sus propias huertas de semilla lo más pronto posible.

Se sugiere la posibilidad de mejorar los bosques de eucaliptos en todo el mundo por el cultivo de indivíduos seleccionados.

Se mencionan los peligros por los animales, insectos y pestes de hongos y se aconseja a los países fuera de Australia que intervengan en la prevención de estas pestes en sus plantaciones.

Se menciona también la posibilidad de que factores nutricionales, inhibitorios y patogénos influyen adversamente en la relación suelo-raiz en los bosques australianos y se hace notar que estos factores pueden disminuir el rendimiento en segundas y subsequentes rotaciones en las plantaciones hechas fuera de Australia.

Como apéndice al documento, hay una tabla con notas sobre el clima del habitat natural de los principales eucaliptos e indicaciones de la tolerancia climática y edáfica., así como tabién la posibilidad de obtener semillas de Australia.

O EUCALIPTO COMO PLANTA EXÓTICA

Resumo

Discutem-se alguns dos hábitos de crescimento que tornam o eucalipto planta exótica de sucesso. Incluem-se sua habilidade em colonizar solos nús, sem sombra, seu rápido crescimento inicial, variabilidade dentro da espécie e vigor do sistema radicular.

Indicam-se as diferenças entre espécies de dominância apical forte e fraca, e descreve-se o método de estabelecer florestas mais úteis com espécies de dominância apical mais fraca.

Sugerem-se regras para a escolha de espécies que convenham a climas diferentes em países fora da Austrália, sendo dada atenção especial aos fatôres que influenciam sua sanidade e a sobrevivência.

O problema do suprimento de sementes é examinado, fazendo-se uma forte recomendação no sentido de que os países que utilizam o eucalipto como planta exótica formem suas próprias hortas porta-sementes tão cêdo quanto possível.

Sugere-se a possibilidade de aperfeiçoar as florestas de eucalipto do mundo pelo cruzamento de indivíduos escolhidos.

Mencionam-se os perigos advindos de animais, insetos e fungos, prevenindo-se países outros que a Austrália no sentido de evitar a introdução de tais pragas em suas plantações.

Menciona-se a probabilidade de fatôres de nutrição, inibitórios e patogênicos, influenciarem as relações solo-raiz de maneira adversa nas florestas australianas, prevenindo-se que êsses fatôres podem reduzir o rendimento na segunda rotação e nas subsequentes, em plantações estabelecidas fora da Austrália.

Como apêndice, é apresentada uma tabela com notas sôbre o clima do "habitat" natural dos principais eucaliptos com indicações sôbre sua tolerância climática e edáfica, e as prováveis disponibilidades no suprimento de sementes da Austrália.