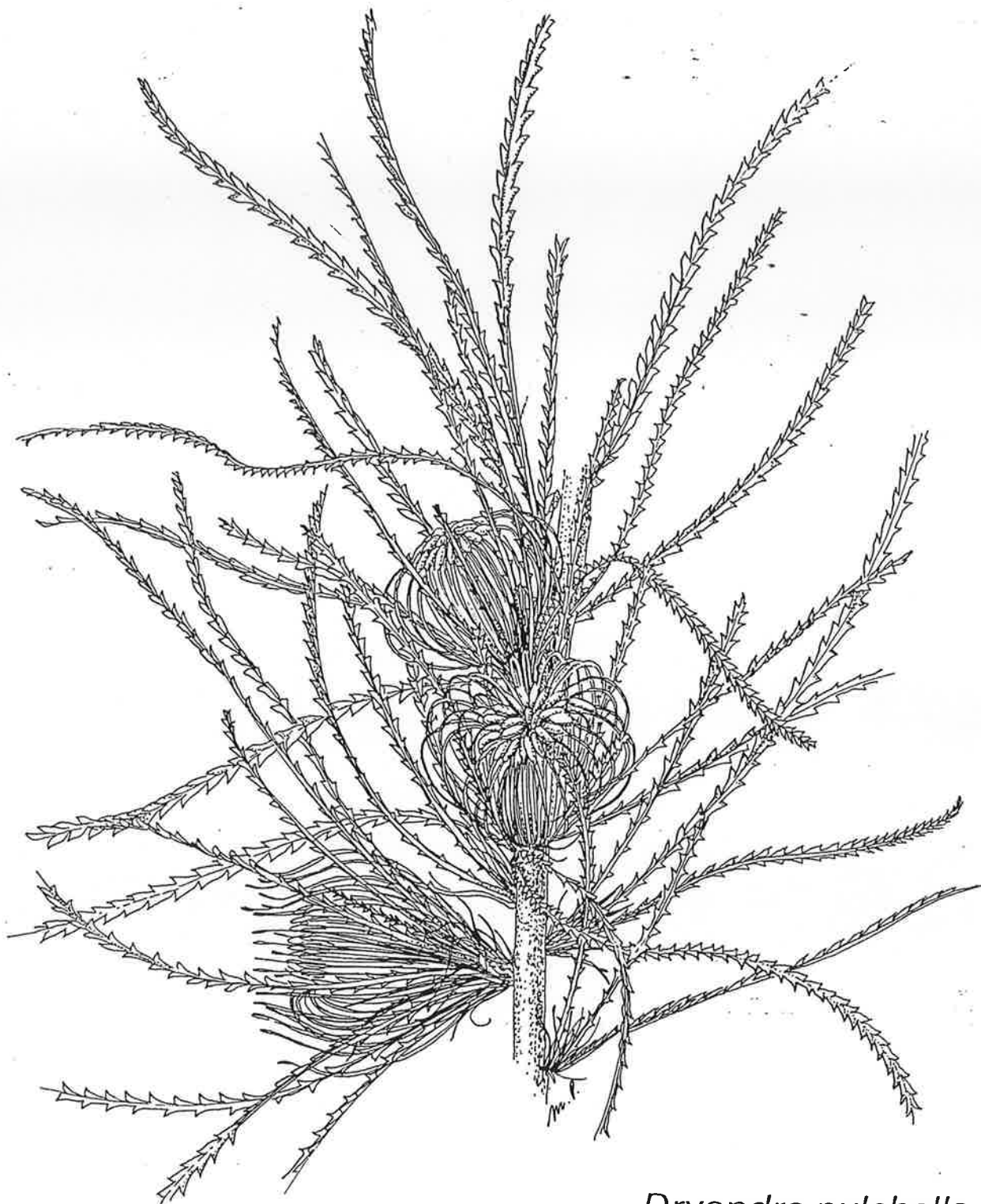


DRYANDRA STUDY GROUP

NEWSLETTER NO. 23



Dryandra pulchella

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SOCIETY FOR GROWING AUSTRALIAN PLANTS

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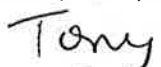
Welcome to the first Newsletter of 1993. It is a little later than usual and I do apologise but Christmas holidays are always a difficult time to motivate oneself. I know Victorians are famous for talking about the weather but this summer has been something to talk about! We have had the wettest spring period on record followed by a mild early summer. The last few days have been heatwave conditions punctuated with violent tropical downpours. This unusual weather pattern has been accompanied by some of the worst humidity I can remember since I left Queensland. I suspect this summer will be a bad one for dryandras and many other Proteaceae - I have already lost at least 6 smaller but well established dryandras and several larger plants and it is so frustrating not to be able to do anything about it.

In this Newsletter, I have included a number of smaller articles from various sources. Many of the field observations have as usual come from Margaret and I think we are all very lucky that she is such a keen observer in the field. Several of these notes deal with possible hybrids or unusual forms and Margaret and I would both appreciate any other information on this aspect. So far, there are no recognised or botanically established hybrids but it would be surprising if some didn't exist. More information is now becoming available in books and I have included some notes concerning particular species of dryandras which are mentioned. Please let us know of any others you come across. There are also notes on perfumed dryandras and on diseases affecting dryandras, two topics on which we know little but which require further research. Lastly, I have included the survey results from the Rare and Endangered survey which has also been sent to the Australian Network for Plant Conservation. Our Cranbourne planting is very important for this survey and I will be including information from there in an updated survey later this year. Several surveys from members and some notes and leaf prints of *D. brownii* and *D. arctotidis* are included to assist members with identification.

Some members have been asking about the Dryandra book Margaret and I are preparing. While we have made a start and Alex George has generously allowed us to use his description from the forthcoming *Flora of Australia*, it will be some time yet before all the new species have been described. As soon as we are able to publish new names and information about these new species, we will do it through the Newsletter. The book will also include a key which we trust will be useful in helping to unravel some of the mysteries.

Just a reminder to members who may have forgotten to pay their subscription in July. Our main expense is the Newsletter and we are unable to subsidise people by continuing to supply the Newsletter to unfinancial members. If there is a cross in the box below, your subscription for 1992-1993 is still owing and this will be your last Newsletter. Please forward your cheques for \$5.00 to Margaret. The subscription for 1993-1994 will be \$6.00.

Happy dryandra growing


Tony Cavanagh



IF THERE IS AN X IN THE BOX, YOUR SUBSCRIPTION IS OUTSTANDING. PLEASE PAY MARGARET IMMEDIATELY

A VISIT TO THE HOPETOUN AND RAVENSTHORPE DISTRICTS

In April last year I went on a weekend excursion to Hopetoun and Ravensthorpe. As it was a geology weekend, I didn't have a lot of time to botanise but we did look at the tall hybrid at Mt. Desmond (see "Possible Dryandra Hybrids" later in this Newsletter) and also spent some time searching for "true" *D. pteridifolia* in flower but unfortunately without success. However, the buds on those we found enabled us to distinguish between the plants with straw-coloured limbs and those with the rarer but very attractive coppery colour. It was noticeable that most plants seem to have set little or no seed. Further south in the Fitzgerald National Park and well north and east of Hopetoun, bushfires have devastated the heathlands and I'm afraid the pollinators of plants such as *D. pteridifolia*, honey possums in particular, may have been wiped out, either killed by fire or deprived of their food flowers for two or three years at least before the dryandras and banksias etc. flower again. This in turn will mean fewer plants seeding.

We did, however, find one flowerhead on the tall hybrid plant at Mt. Desmond. I have taken slides and hope that these will help me decide whether it really is a possible *D. quercifolia* X *D. foliosissima* hybrid. It does seem likely as *D. quercifolia* was flowering all around and *D. foliosissima* was in bud.

Margaret Pieroni.

A POSSIBLE NEW DRYANDRA FROM THE LITTLE DARKIN SWAMP?

Last year, one of the C.A.L.M. rangers collected a nearly spent flowerhead of a dryandra from the Little Darkin Swamp area. At the time, I thought it might be a form of ASG 3 (aff. *calophylla-pteridifolia*) but I needed a fresh specimen to be sure. In late May, I drove out to the location with one of the rangers. It's about 30 kms. S.W. of York in a heathland surrounded by forest. After several hours of searching we finally re-located the plants only to find that they'd long since (a month at least) finished flowering. From the old flowers, I would say that it is more like a miniature *D. blechnifolia* or ASG 22 (aff. *D. pteridifolia*) than the ASG 3 which was my first thought. The flowers are only slightly smaller than *D. blechnifolia* but the leaves are only half the size. The size of the leaves and the habit of the plants (with stems underground) are like ASG 3 but their shape and colour are more like *D. blechnifolia*.

Margaret Pieroni.

A NEW FORM OF *D. MUCRONULATA*

A couple of years ago, I saw a plant at Pat and Norm Moyle's which I couldn't identify. While it had some of the characteristics of *mucronulata*, the leaves were shorter and had a dark green upper surface making the bush most attractive. When it flowered last year, I sent a specimen to Alex George and he said it might be the aff. *mucronulata* we'd been looking for which had been collected by Ken Newbey south-west of Broomhill. Alex had looked for Ken's plant and I had looked twice without finding it although at the time, I did not realise that it was aff. *mucronulata*. The origin of the Moyle's plant was seed given to them years ago by a member of the Wildflower Society who now lives in Albany. She remembered collecting it north of Tamballap, which is not far from the Broomhill location, although the plants have long since been cleared. It may be that this form no longer exists in the wild unless there are other locations that we don't know of.

This new form is a very attractive plant and differs from the "standard" *D. mucronulata* mainly in the leaves and flower heads. It's leaves are only about half the size of the normal form and are stiffer - it is more like *D. baxteri* in habit. The flower heads are showier although of about the same diameter. The bracts are narrower and do not cover the flowers which spread more. They

are similar in colour - buff with red-brown streaks - but are deep pink inside and can be seen because the flowers, which are a delicate pink with a green limb, spread out. It is altogether a more attractive plant than the normal *D. mucronulata* and even if it turns out not to be the Ken Newbey form we were looking for, or not new but merely a form of *D. mucronulata*, it will be a very good one for cultivation.

Margaret Pieroni.

(Editor's Note: After I had received this information from Margaret, I remembered that a friend of mine, Doug McKenzie had a strange looking dryandra that I felt had to be a form of *D. mucronulata*. It just "looked" like one and the flower heads were similar. However, the upper surface of the leaves is dark green unlike the pale green of "normal" *D. mucronulata*. I sent a sample of the plant to Margaret and she confirms it is the same as the Moyle's plant so that we now know of at least two in cultivation. Doug's specimen is about 1.8m by about 2m spread and is at least 12 years old. It is growing in a very dry area and is shaded by an overhanging eucalypt. Doug believes he originally obtained the seed as *D. mucronulata* from the Kings Park seed service (in the days when they sold seed). I am hoping that it has set seed and if so, I will supply some to Margaret. As Margaret indicates, it is well worth growing.

Please let Margaret or myself have reports of any unusual dryandras you are growing, preferably with a flowering specimen).

POSSIBLE DRYANDRA HYBRIDS

In Newsletter 21 (Dryandra Field Trip August 1991) I reported on a hybrid *D. quercifolia* X *D. aff. ferruginea* in the Ravensthorpe Range. In the same issue, Val Crowley wrote of her possible hybrid swarm of *D. subpinnatidida* X *D. squarrosa*. While there is no botanical evidence as yet that these really are hybrids, many of the plants show features and characteristics of both supposed parents and quite often, it is possible to find intermediates in a population showing more of the characteristics of one parent than the other. On my trip to Ravensthorpe and Hopetoun in April last year, I again visited the tall hybrid near Mt. Desmond, this time hoping to be in time to see it in flower. As I've previously noted, we found one in flower but I also made some further observations on this most interesting collection of plants. As the tall hybrid is growing close to a *D. foliosissima*. I have come to the conclusion that it is probably *D. quercifolia* X *D. foliosissima* both of which are in flower/bud in April-June. If my theory is correct, and the proximity of the various species to the hybrids in the Mt. Desmond area suggests this, we have:

D. quercifolia X *D. cirsioides* (several plants - a hybrid swarm).

D. quercifolia X *D. ASG No. 36* (aff. *ferruginea*) - one plant

D. quercifolia X *D. foliosissima* - one plant.

I suppose these possible hybrids complicate identification somewhat but you never know when one might turn out to be an excellent garden plant.

Margaret Pieroni.

DRYANDRA STUPOSA FOR FLORAL ART

Margaret mentioned in a recent letter that *D. stuposa* was among the species used for floral art in a W.A. Week display held in Perth. She mentioned that most of the dryandras came from a wildflower farm at Muchea north of Perth so it is interesting to see that this uncommon species is in commercial cultivation even if very few of our members are growing it. It is one that I have recommended to people because it has attractive bluish foliage and mostly terminal flowers which of course make it ideal for picking and for floral art work. It also has the added advantage of having the odd flower all the year round.

I had a plant which was at least eight years old, growing in a dry, partly shaded area. While not thriving, it had hung on in an unsuitable area, flowers throughout the year and had reached 2m by about 0.75m. It died recently in our heatwave conditions which were followed by tropical thunderstorms. We have a number of plants at Cranbourne which flower prolifically as late as December. It is very similar to *D. nobilis* although the flower heads are smaller and the leaf lobes barely reach half way to the midrib whereas in *D. nobilis*, they cut to the midrib. In addition, the flower heads on *D. stiposa* are largely terminal whereas a characteristic of *D. nobilis* is that they are usually crowded along the stem among dense foliage which often later dies and gives the shrub a very untidy appearance. I have attached copies of "typical" leaf prints which hopefully show the differences. Hartley Tobin once described *D. stiposa* as not being so "bold" as *D. nobilis* and I think that is pretty correct - it is more compact and less sprawling.

Tony Cavanagh.

DRYANDRAS IN BOOKS

I was recently working on a bibliography of publications and articles on banksias and found several references to dryandras in lists of and books about endangered Australian plants as well as several others. For the interest of members, I have briefly discussed them below:

An introduction to the Proteaceae of Western Australia by Alex George. Sydney, Kangaroo Press, 1984.

This book is in the same series as Alex's very popular book on Banksias and includes 20 Dryandras. Each is illustrated with one or more close up pictures which greatly assist identification. The text is brief but adequate and usually includes information about the locality, flowering period and specific characteristics which distinguish the species. Some of the more unusual or rare species discussed include - *D. kippistiana*, *D. vestita*, *D. pulchella*, *D. shuttleworthiana*, *D. arborea*, *D. mimica* and *D. nana*.

Extinct and endangered plants of Australia by J. Leigh, R. Boden and J. Briggs. Macmillan, South Melbourne, 1984.

The authors list and illustrate only one dryandra, *D. squarrosa* although this species is no longer regarded as endangered. At the time of a survey by Neville Marchant and Greg Kighery in the late 1970s (*Poorly collected and presumably rare vascular plants of Western Australia*, Kings Park Research Notes No. 5, 1979. Kings Park Board, Perth) apparently there was only one specimen in the Perth Herbarium which was considered to match the type specimen. Since then, several small populations of the "southern" form (type), some on conservation lands, have been found so this form has now been removed from the endangered lists but is still included on a "reserve" list by the CALM authorities in Western Australia. Alex George considers that the much more common "northern" form, usually referred to as *D. carduaceae*, is the same species. I have both growing and they are very similar although my "squarrosa" has longer, narrower leaves and slightly smaller flowerheads compared with "carduaceae". *D. squarrosa* is growing rampant at Cranbourne and is almost assuming the status of a weed, with seedlings literally coming up everywhere! Some of the forms are very large, densely foliated plants with much longer leaves than the more delicate plants we usually see.

A guide to the gazetted rare flora of Western Australia by B.L. Rye and S.D. Hopper. Report No. 42, Department of Fisheries and Wildlife, Perth, 1981.

The two species listed here, *D. comosa* and *D. pulchella*, were included in the Schedule of rare flora for W. A. in 1980. Their inclusion reflected more a lack of knowledge of the distribution of these species than rareness and

neither is included in the latest reserve listings. Both species are from the Wongan Hills and are restricted to this area. Each is illustrated with line drawings of a flowering specimen and a leaf and has a brief description of the main characteristics. *D. pulchella* in particular is a very attractive small plant while *D. comosa* can be up to 3m across and high. Neither is widely grown but should be on account of their restricted habitat.

Western Australia's endangered flora and other plants under consideration for declaration by S.D. Hopper, S. van Leeuwen, A.P. Brown and S.J. Patrick. Dept. of Conservation and Land Management (CALM), Perth, 1990.

Margaret referred to the dryandras listed in this, the most recent publication on W. A.'s endangered plants. Three dryandras are illustrated by line drawing or in colour, two of them as yet unnamed. They are *D. serratuloides*, *D. sp. nova* ASG 54 "Kamballup" and *D. sp. nova* ASG 12, Stirling Range National Park. All three are being grown by members of the Study Group (see The Rare and Endangered Dryandra Survey later in this Newsletter). It is important that all the rare species be grown in as many locations as possible to determine their cultivation requirements and in later years perhaps to provide seed and propagating material.

Leaf and branch: trees and tall shrubs of Perth by Robert Powell. Department of Conservation and Land Management, Perth, 1990.

Margaret provided many of the line drawings for this well-produced publication. Only two species fit the requirement of "tall shrubs and trees", *D. sessilis* and *D. squarrosa* and each is illustrated with line drawings and has a brief table of distinctive features. What makes the book particularly interesting are the additional notes on ecology, associated fauna and even human uses. Thus we learn that *D. sessilis* is one of the state's chief honey producers, it provides nesting habitats for various honeyeaters even within the city of Perth and provides protection for burrows for bandicoots. The seeds are eaten by ringneck parrots and black cockatoos.

And finally, Margaret was intrigued by a reference to a dryandra in a book by the 19th century English trader and adventurer Robert Fortune. It was about the tea trade in China and referred to a dryandra growing in one of the large gardens in China. We only later discovered that this "dryandra" was in fact a member of the genus *Aleurites*, the name dryandra being originally applied to this genus. What a shame - it seemed at the time a very interesting discovery!

If you know of other references to dryandras in books, please let Margaret or myself know and we will publish the information in future newsletters.

Tony Cavanagh.

PERFUMED DRYANDRAS

Margaret recently had a letter from a nursery owner in Avon in England. He reported that he grew a lot of plants for conservatories with a particular stress on Australian plants. Banksias and dryandras in particular were proving good sellers as evergreen foliage plants for containers. So far, he has flowered two dryandras, *D. praemorsa* and *D. carlinoides*, and reported that they both had a very noticeable scent, *D. praemorsa* being "lemony" while *D. carlinoides* was "absolutely fantastic, one of the loveliest flower fragrances I have ever come across". Has anyone else noticed fragrance or scent with dryandras? Some like *D. shanklandiorum* have a pretty unpleasant odour but I can't say I have noticed that dryandras are perfumed. This is an aspect we have not reported on before - if you have observations on any species, I'd like to hear of them. Marion Blackwell assured Margaret that *D. carlinoides* does have a sweet perfume!

Tony Cavanagh.

NOTES ON GERMINATION

From Margaret: Because of damping off problems with seed sown in pots, I have made some changes in my methods of propagation. I am now growing plants (I hope) from seed sown directly in the garden. I'm aware that even if I succeed, it won't contribute much to our knowledge of propagation with a view to growing plants for the nursery trade or as popular garden subjects but I'm tired of losing plants in pots when I've tended them for months. I suspect that watering, too much or too little, is the biggest single factor in causing losses to plants in pots, especially over summer when weather is so variable.

I cleared small patches in the garden of leaf litter to sow the seeds of about 12 species and watered them in with "Wettasoil" as the sand on the surface repels water. To keep the local cats off, I placed sticks around the cleared areas, watered when it hadn't rained and crossed my fingers. The seeds germinated more slowly than seeds sown in pots taking about six weeks but then I struck another problem, a mysterious "midnight muncher" which cleaned up several seedlings so I had to bait the area as well.

The last seedlings germinated after about nine weeks and the method has proved so successful that I have been able to pot up excess seedlings leaving one or two in situ. These are growing strongly so perhaps this "back the front" method will be successful. With luck, my potted seedlings might be planted out next season! Contrast my lack of success with seeds sown in trays. Despite being sprayed and drenched and carefully watered, every seedling collapsed from damping-off, none even producing true leaves.

From Tony: A cautionary tale. Last year because of various other commitments, I was very late in sowing my dryandra seeds, not getting them in till late October. They were commercial seed and looked good and plump yet I had almost no success from about a dozen species. Some were sown in a sand-peat moss mix while others were sown directly into pots of propagating mix. It made no difference, the results were equally bad. We have had an unseasonably wet year and perhaps the seed rotted but I also believe that it was probably too warm and that dryandra seeds need the cold of autumn/winter or winter/spring. I will be sowing in late March this year!

DISEASE PROBLEMS WITH DRYANDRAS

Has anyone else had problems with scale or fungus affecting the leaves of dryandras, especially the prostrate ones? The most susceptible seems to be *D. drummondii* - nearly every plant I've seen has very disfigured leaves with orange rust-like spots on nearly every leaf lobe. Eventually, the leaves brown off and die and the plant looks very unsightly although it doesn't prevent flowering. Several years ago, I sent affected leaves to the Victorian Garden Advisory Service who advised that the markings were caused by a fungus known as *Colletotrichum* which while it was a fairly significant pathogen of young plants, was less serious in older plants providing they were otherwise healthy and growing strongly. They further advised removing affected leaves and encouraging strong quick plant growth. If necessary, a foliar spray of "Benlate" or similar fungicide could be applied at ten day intervals.

Margaret has had similar problems with a type of scale affecting prostrate banksias and some dryandras. She reports that it seems worse when the plant is in flower with the leaves becoming quite orange. The condition can last for several years. Several plants have died seemingly with the disease contributing, including *D. drummondii* (which died from the leaf tips down) and *D. nobilis* which had unsightly leaves for a long time and finally succumbed to termites.

I would be interested in learning of other diseases which might affect dryandras as I had always thought they were reasonably hardy and only significantly affected by diseases like *Phytophthora*.

DRYANDRAS AT COBRAM, VICTORIA

I have reproduced David Randell's list of dryandras because it demonstrates just how many species can be grown even though as David will himself admit, some species are quite difficult. It is only by trying a variety in different garden conditions that we can identify problem species and more importantly, hopefully find a solution to their needs. I have several other survey forms and will incorporate the species they list in our master file of species in cultivation.

This is an update list of my Dryandra's in the garden.

* :- Grown in 8 inch pots since last year. S & G :-Sun for just planted & Growth for planted before 9/9/91.

NAME	PLANTED	H	W	S & G	COMMENTS
arborea	1/6/92	.1x.05		full	
ashbyi	15/4/92	.3x.7	.2x.5		growing well.
baxteri	20/4/92	.25x.25		full	
bipinnatifida	20/9/87	.2x.35	0x.1		very slow growing but healthy.
brownii	14/5/92	.3x.45		full	
calophylla	* 15/4/92	.4x.6		full	
carduacea	12/5/92	.1x.2		full	
carlinoides	14/5/92	.5x.6		full	will flower this year.
cirsiodes	* 17/4/92	.5x.4		full	
comosa	22/4/92	.3x.2		full	
conferta (547)	28/4/92	.15x.15		full	
drummondii (1)	1/8/90	.25x.6	.1x.15		a few flowers for the first time but hidden in foliage.
drummondii (2)	5/4/91	.25x.1	0x0		has a large number of well displayed flowers coming. Flowered in June & July 91
erythrocephala	5/4/91	.15x.3	0x.2		struggling.
ferruginea (1)	5/4/91	.25x.4	.15x.2		very healthy.
ferruginea (2)	16/5/92	.05x.05		full	
foliosissima	14/5/92	.2x.2		full	
formosa	15/4/92	.2x.3		full	
fraseri	20/6/83	.5x1.7	0x.2		flowers each year for 4-5 months between the 5th & 10th month.
hewardiana	25/5/92	.1x.2	1/2		full sun summer full shade winter.
horrida	5/4/91	.2x.3	.1x.1		
kippistiana	12/5/92	.05x.05		full	
mucronulata	* 14/5/92	.5x.45		full	
nivea (1)	5/4/91	.3x.7	0x3.5		slight yellowing of leaves.
nivea (2)	13/8/89	.3x.6	.05x.1		slight yellowing of leaves.
nobilis	5/4/91	.4x.5	.2x.3		slight yellowing of leaves.
obtusa	13/8/89	.35x.6	.1x0		has 4 flowers and is very healthy.
plumosa	14/5/92	.15x.15		full	
polycephala	5/4/91	.45x.3	.3x0		quite healthy with a few flowers coming.
preissii	14/5/92	.05x.05		full	
proteoides	20/3/90	.2x.2	.5x0		very slow growing but seems healthy.
pteridifolia	1/6/92	.15x.2		full	
pulchella	14/5/92	.2x.3		full	
quercifolia	5/4/91	.6x.5	.3x.4		this plant is one twisted stem with a flower at the top.
senecifolia	5/4/91	.25x.1	.1x0		slow growing but healthy.
serratuloides	20/4/92	.2x.1		full	

shanklandorum	5/4/91	.25x.35	.05x.1	leaves yellowing, I had this as preissii in my last report.
speciosa	18/4/92	.3x.15	full	
stenoprion	14/5/92	.1x.15	full	
stuposa	* 14/5/92	.25x.3	full	
subpinnatifida	* 12/5/92	.2x.45	full	
tenuifolia	23/8/88	.35x1.2	.05x.2	Flowered in August & September 90 but hasn't flowered since.
sp tenuifolia	29/5/92	.1x.05	full	
tridentata	15/8/91	.1x.1	0x0	looks very sick.
No.3 aff nervosa	28/4/92	.15x.3	full	
" 7 (sp B)	14/5/92	.15x.4	full	
" 15 (sp I)	* 14/5/92	.5x.4	full	
" 16 (sp D)	21/12/88	.5x1.2	.1x.2	will be covered with flowers this year but hasn't set seed yet.
" 19 ferruginea	16/5/92	.15x.15	full	
" 20 aff armata (sp H)	19/5/92	.15x.15	1/2	
" 23 aff fraseri	12/5/92	.1x.1	full	
" 24 aff nobilis	14/5/92	.15x.2	1/2	
" 26 aff nivea	14/5/92	.1x.2	full	
" 30 aff squarrosa	14/5/92	.15x.15	full	
" 34 aff ferruginea	17/5/92	.05x.05	full	
" 36 aff ferruginea	2/5/92	.1x.2	full	
" 37 sp novo "Kalin"	29/5/92	.05x.05	full	
" 38 aff drummondii	28/4/92	.15x.2	full	
" 41	14/5/92	.05x.2	full	
" 45 aff serratuloides	12/5/92	.15x.2	full	
" 49 aff ferruginea	28/4/92	.1x.15	full	

I have potted up one each of No.3 aff nervosa, No.5 sp novo, No.7 sp B, No.16 sp D, No.19 ferruginea, No.20 aff armata sp H, No.23 aff fraseri, No.24 aff nobilis, No.26 aff nivea, No.30 aff squarrosa, No.34 aff ferruginea, No.36 aff ferruginea, No.37 sp novo Kalin, No.38 aff drummondii, No.41, No.45 aff serratuloides, No.49 aff ferruginea, arborea, armata, baxteri, calophylla, carduea, cirsioides, comosa, conferta, conferta 547, foliosissima, formosa, hewardiana, horrida, kippistiana, nana, pteridifolia, preissii, serratuloides, speciosa, sp novo Newdgate, sp tenuifolia, stenoprion, ~~vestita~~ into 8 inch pots because they seem to do better when planted.

All seed sown last June are healthy & growing well but most of the September ones are still very small.

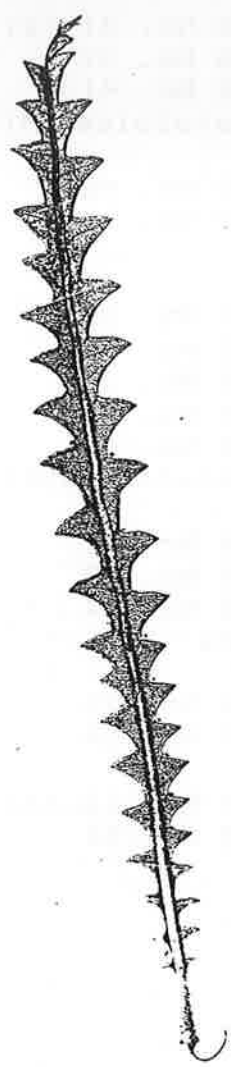
Over summer I lost No.15 sp I, ashbyi, brownii (1) (2) (3), calophylla, cirsioides, ferruginea (3), formosa, mucronulata, nivea (3), obtusa (2), serratuloides, sessilis, sp, speciosa, stuposa, subpinnatifida, tenuifolia prostrate in the garden and 1 No.5 sp novo, 1 No.19 ferruginea, 1 No.49 aff ferruginea, 1 nana & 3 subulata. Most of these became very yellow so I treated them with the iron chelates mix and most didn't last long after the treatment. After the last newsletter I bought a bottle of Molytrac and it seems to be working better.

DRYANDRA ARCTOTIDIS AND DRYANDRA BROWNII

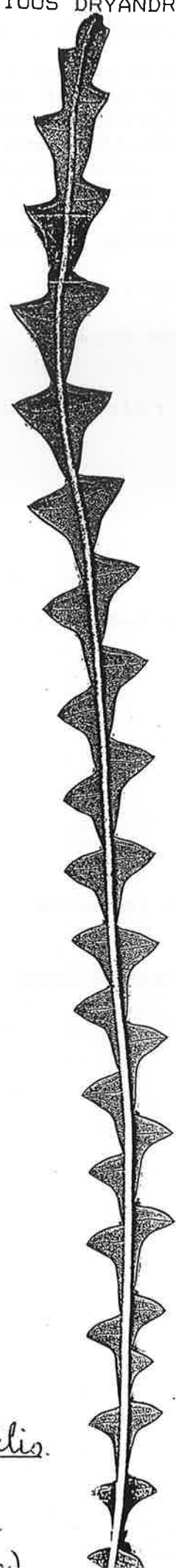
There is still a lot of confusion in the nursery trade and among members about the identification of these two species. It is compounded by mislabelled plants from nurseries and earlier sales of wrongly labelled seed. There are two easily recognised features of *D. brownii* which distinguish it from *D. arctotidis* - its size (0.5m by 1-1.5 m spread) while *D. arctotidis* is about 0.3m by 0.75m and the distinctive bluish colouration of the leaves, especially if the plant is growing in part shade. The leaves of *D. brownii* are also much longer and wider and individual leaf lobes are broader and lack the distinct mucronate tips of *D. arctotidis*. The leaves of the latter are also distinctly "V" shaped. See the leaf comparisons on the attached page.

Margaret reports that she doesn't know of any plants of *D. brownii* which have flowered in cultivation. Has anyone flowered it? I have several old plants now in part shade which haven't flowered but a young one in more sun is a possibility.

LEAF PRINTS OF VARIOUS DRYANDRAS (BACK VIEW OF LEAVES)



D. stipulosa

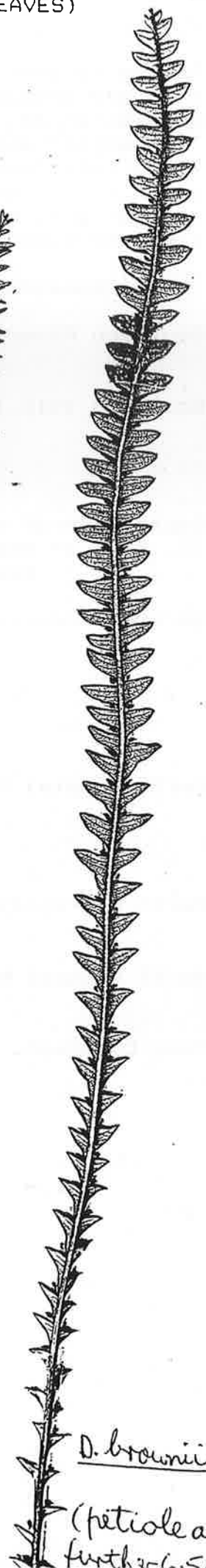


D. nobilis.

(petiole a
further 6 cm.)



D. arctotidis



D. brownii

(petiole a
further 3-6 cm.)

THE RARE AND ENDANGERED DRYANDRA SURVEY

Thanks to everyone who supplied information on rare and endangered dryandras they are growing in response to our appeal with Margaret's article in Newsletter 22. The full list is reproduced below and indicates that No. 54 "Kamballup" and No. 41 (aff. *calophylla*) were the most extensively grown with three locations for each. Both *D. serratuloides* and *D. mimica* were only being grown in one garden each. I will repeat the survey in about 18 months time to monitor progress but in the meantime, I would welcome reports from anyone else who might have grown any of these species.

Location	Garden Conditions	Species	Notes
Southern Riverina	Clay-loam soil	ASG No. 41 ASG No. 54	Pots
Goulburn (Vic.)	Clay-loam in raised beds	ASG No. 31 (2) ASG No. 37 ASG No. 41 <i>serratuloides</i> (M)	Flowered Cutting
South-Central Vic. (E. side of Westernport Bay)		ASG No. 48 ASG No. 54	
Northern Central Vic.	Sandy loam over clay	ASG No. 20 ASG No. 23 ASG No. 37 ASG No. 41 ASG No. 49 <i>serratuloides</i> (B)	
Perth Coastal Plain	Sand	ASG No. 41 ASG No. 49 ASG No. 54 <i>mimica</i>	
Perth Metropolitan Area	Sand with laterite gravel	ASG No. 23 ASG No. 54	Flowered
South Coastal Vic.	Clay-loam raised beds	ASG No. 12 (2) ASG No. 31	

Tony Cavanagh.

STUDY GROUP LEADERS WORKSHOP/SEMINAR, CANBERRA, OCTOBER 24/25, 1992

Margaret attended the Workshop and reported that it was both informative and gave her the opportunity to meet with and discuss study group matters with other leaders. Bob Mylius who is Study Group Liaison Officer with the Victorian Branch of SGAP produced the following report in the SGAP Vic. Inc. Newsletter for December, 1992 and I have reproduced it for the information of members. I will hopefully attend the March meeting of Victorian Study Group Leaders and will include any additional information in our next newsletter.

Study Group News

Bob Mylius

Study Group Leaders workshop/seminar held at the Australian National Botanic Gardens Canberra, October 24/25 1992

The weekend was organised by Geoff Butler of the Australian National Botanic Gardens and hosted by the Canberra Group of SGAP.

Subjects covered included:

- Administration
- Funding
- Newsletters
- Questionnaires
- Recording
- Living collections
- Collecting from the wild
- Seed banks
- Cutting exchange
- Propagation
- Registering cultivars
- Access to Professional Botanists
- Publicity and public relations
- Study Group Leaders Manual

The first task carried out in the workshop was to provide information and guidance to enable preparation of a manual for issuing to all Study Group Leaders.

Peter Olde, leader of the Grevillea Study Group, spoke on what is involved in running a study group and provided plenty of useful suggestions on how to carry out secretarial tasks efficiently, raise funds, what to include in newsletters, projects that can be undertaken, and mentioned the importance of quarantine in distributing seeds and cuttings.

A journalist from the *Canberra Times* discussed how to get articles published in City and Local newspapers. Another speaker described various aspects of preparing a newsletter and the costs involved.

Bob Mackinson and Ian Telford gave a very useful talk about collecting plant specimens, making field notes, pressing specimens, lodging of field duplicates with herbariums and methods of protecting specimens from fungal and insect attack.

Information on setting up seed banks was outlined by Barry Wadlow with details on storage, recording, protection of seed, timing of seed collection, and base and active collections.

Stewart Donaldson discussed endangered species, this included monitoring in the wild and cultivation, site security of communities of endangered plants, quarantine (dangers of spreading fungal diseases with secateurs, boots etc.), reintroduction into the wild and preparing a list of endangered species.

D. K. McIntyre showed by means of a chart the complexities involved in the effects of climate, parental material, relief and time on the growth and habit on a particular plant in a particular garden. He used this to illustrate the importance of taking care in preparing questionnaires.

Geoff Butler spoke about hybrids and the Australian Cultivar Registration Authority and guidelines for names.

It was agreed by all who attended the weekend that it had been a great success. The opportunity for Study Group Leaders to meet and exchange ideas and learn from each other was considered well worthwhile. Everybody agreed that similar meetings should be held in the future, perhaps in conjunction with Federal Conferences.

I would like to thank Geoff Butler and the Canberra Group for their hard work and wonderful hospitality over the weekend.

Over the weekend the following literature was handed out.

International Code of Botanical Nomenclature Barry Conn.

A Strategy for Seed Banking in Botanic Gardens J. G. Hawkes.

Procedures for Handling Seeds in Gene Banks J. Hanson.

Plant Collecting — Some Definitions.

Collection, Preparation and Preservation of Plant Specimens Royal Botanical Gardens Sydney.

Keep It Legal: Collecting Permits and Protocols.

Guide to Collecting Requirements for Australian Fauna and Flora.

Starting Your Own News sheet from Public Relations Handbook for Clubs and Associations by J. R. Macnamara 1985, Margaret Gee Information Group Melb.

Preparation of Figures for Publication and Presentations D. Mackay.

Application form for the Registration of an Australian Plant Cultivar.

Newsletter for Australian Network for Plant Conservation Vol 1(3) 1992.

There is to be a meeting in March 1993 of Victorian Study Group Leaders at which a manual and copies of the above literature will be distributed.

STUDIES OF AUSTRALIAN PLANTS IN ITALY

Recently, Dr. Fiorenza Coppola of the national Institute for Nuclear and Alternative Sources in Rome joined the Dryandra Study Group. She sent me a report on her work and from it I have extracted the following information.

"For the past three years, my interest has focussed on ornamental plants, annual and perennial, particularly of Australian origin. While they are mainly Proteaceae (Banksia, Hakea and Dryandra), I am also interested in Calothamnus and Melaleuca species. My work is under the direction of Professor Alessandro Pignatti, Professor of Ecology at Rome University and I am working in collaboration with the Vegetable Biology Department there.

There are many problems to be overcome with propagating Proteaceae and there is much to be learnt about the genetics of their breeding. For this reason, I hope to be able to set up a collaborative study with other universities, the Ministry for Agriculture and Forests and private nurseries. I have organised a small Dryandra study group with some researchers from the Experimental Institute for Plant Nutrition. We intend to extend our preliminary studies with a number of Dryandras to an examination of two or three promising species using 1000 seeds or more and to treat them with various chemical and physical mutagens to determine their response. We would hope that the data obtained will increase our understanding of the genetics of breeding of Dryandras and will have practical application in nursery propagation as well.

Fiorenza Coppola.

I'm sure all members wish Dr. Coppola's project success. I will report any future developments. (Ed.)

DRYANDRAS AT THE GURDIES, VICTORIA

As far as environmental conditions (namely rainfall) here go, 1991 was another abnormal year with November being the only month with near average rainfall and numbers of wet days. February, March, April, May and October all being very dry months with rainfall being less than half average and numbers of wet days varied from average to less than half. All the other months were extremely wet with rainfalls half as much again, or more, than average. Likewise, most of those months had one third as many wet days. The year overall worked out at being one of the wettest on record, 13+% above average.

CORONET BAY:

The number of Dryandras, here, is now ONE. As I mentioned last year I do not get to visit the place as frequently as I would like with the result that the Dryandras get neglected and as I also mentioned, I do not intend replacing any lost Dryandras.

203 *D. drummondii*: the one survivor continues to grow well despite, as I have previously mentioned, the crowding from neighbouring plants. It still flowers well each year but produces no seed.

101 *D. nivea*: (This plant is actually what is now *D. brownii*) The plant struggled in its early years but recently has been looking very healthy and strong and flowering each year. It should have still been listed as a survivor had it not been for the intervention of the local shire and their mighty drainage scheme which went right down the side of the house where a number of choice, well-established plants were growing. The plant measured nearly one meter across so right in the middle of summer I had to try and transplant it, at the same time I took numerous cuttings. In the end all were without success.

THE GURDIES:

8901 *D.sp.* (D.11) was initially going to be listed as a loss for 1991 as mentioned last year it had suffered with the dry weather, then, a couple of weeks ago I noticed some new growth on what I previously had thought to be a dead stick. Its relative, 8902 is doing very well and, although, will not flower this year I feel it should have a good chance in 1993.

8600 *D.fraseri*: (Previously listed as *D.ashbyi*) This plant continues to grow well and has quite a number of flower buds which should open during the next month or so.

8408, 8607, 8608, 8609, 8610 & 8612 all *D.bipinnatifida* still continue to battle the rabbits. At the moment the rabbit population is depleted and if it can be kept that way these plants might start to put on a real show.

9002, 9003 & 9004 all *D.drummondii* continue to survive although progress is slow. Hopefully, they will put on some noticeable growth during the next twelve months..

8208, 8209 & 8210 all *D.formosa*, as previously mentioned, were all severely pruned in 1990. Last year the plants flowered well, but, all three plants 'gave up', not as a result of the pruning but from the wet June and July which had followed four extremely dry months. When I checked the soil it had become water-logged (and I mean really WATER-LOGGED) to within 100m. of the surface of the soil - the tale of getting the tractor bogged is another story. Although I have a number of other *D.formosa* planted for cut flowers elsewhere on the property I have not been keeping records of their growth and general progress. At the moment I do have numerous *D.formosa* seedlings which will also be planted out for future cut flowers, but I will plant a couple in the gardens near the house and keep details of their progress.

8904 *D.'kamballup'*: continues to be a very strong plant. The extreme variation in climatic conditions does not seem to worry it. I had hoped it would flower this year but it now looks as if I will have to wait another twelve months.

8621 *D.nivea* (another *D.brownii*) I had mentioned last year as a fatality. Well it appears as though some plants are as keen to survive as I am for them to survive. I blame a black bird for my mis-information. This little unwelcomed visitor tends to enjoy scratching about in the mulch on the garden and must have covered the few green leaves that the plant had retained. Once they were discovered I made a point of propping up the stem so that the leaves could make use of the appropriate solar energy. It seems to have worked as the plant is now looking much healthier.

8205 *D.preissii* as mentioned last report has been corrected from *D.pteridifolia*. I might as well have saved my report space. The plant never appeared happy where it had been planted although it did produce the odd flower and, at times, looked as if it was going to make a real effort with foliage, but, in 1991 it obviously decided 'that was it'.

9001 *D.quercifolia*, in my last report I mentioned that I thought at last I was succeeding with this species. Well it was not to be and I don't have any explanation. The plant continued its great progress, then one day I thought it looked a bit sick, the next, it was well and truly dead.

All other plants are looking good and it does not look as if they are going to cause me any concern.

Two plants that I have in pots and hope to add to my collection this year are *D. aff. falcata* which was aptly named 'cactus' and a *D.pteridifolia* (from between Katanning and Borden - I'll have to see if I can work out exactly where). I have a number of other species as seedlings and am praying that they do not succumb to pest or fungus attacks. Germination of *D.proteoides* has been great but then they seem to give up for one reason or another. There is a batch of about 20 that are looking good at the moment so perhaps this time I will succeed in getting some plants through to the planting out stage.

DRYANDRA GROWTH INFORMATION

HARTLEY TOBIN

CORONET BAY
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No.	NAME	SIZE H-x-W	AGE	MULCH	MOIST	DRAIN	SUN	FLW	SEED
203	D. DRUMMONDII	0.7x1.6	10	YES	SAWS	GOOD	50%	YES	NO

THE GURDIES
#####

No.	NAME	SIZE H-x-W	AGE	MULCH	MOIST	DRAIN	SUN	FLW	SEED
8600	D. FRASERII	0.5x0.6	6	YES	SAWS+	GOOD	70%	YES	NO
8412	D. BAXTERI	0.8x1.4	8	YES	SAWS+	GOOD	80%	YES	YES
8604	D. BAXTERI	0.7x0.5	6	YES	SAWS+	GOOD	70%	YES	NO
8408	D. BIPINNATIFIDA	0.3x0.2	8	YES	SAWS+	GOOD	70%	NO	NO
8607	D. BIPINNATIFIDA	0.2x0.1	6	YES	SAWS+	GOOD	70%	NO	NO
8608	D. BIPINNATIFIDA	0.1x0.1	6	YES	SAWS+	GOOD	70%	NO	NO
8609	D. BIPINNATIFIDA	0.2x0.1	6	YES	SAWS+	GOOD	70%	NO	NO
8610	D. BIPINNATIFIDA	0.1x0.1	6	YES	SAWS+	GOOD	70%	NO	NO
8612	D. BIPINNATIFIDA	0.1x0.1	6	YES	SAWS+	GOOD	70%	NO	NO
9002	D. DRUMMONDII	0.2x0.2	1	YES	SAWS+	GOOD	70%	NO	NO
9003	D. DRUMMONDII	0.1x0.1	1	YES	SAWS+	GOOD	70%	NO	NO
9004	D. DRUMMONDII	0.1x0.1	1	YES	SAWS+	GOOD	70%	NO	NO
8904	D. 'KAMBALLUP'	0.2x0.2	3	YES	SAWS+	GOOD	80%	NO	NO
8621	D. BROWNII	0.2x0.5	7	YES	SAWS+	GOOD	70%	NO	NO
8206	D. NOBILIS	3.2x1.6	10	YES	SAWS+	GOOD	80%	YES	YES
8402	D. PRAEMORSA	2.9x2.3	8	YES	SAWS+	GOOD	80%	YES	YES
8631	D. SESSILIS	0.8x0.3	6	NO	SAWS+	GOOD	60%	YES	NO
8810	D. TENUIFOLIA	0.2x0.5	4	YES	SAWS+	GOOD	70%	YES	NO
8901	D. sp. D.11	0.1x0.1	3	YES	SAWS+	GOOD	70%	NO	NO
8902	D. sp. D.11	0.3x0.3	3	YES	SAWS+	GOOD	70%	NO	NO

Hartley
Tobin.

SAWS+ = moisture summer, autumn, winter & spring -
(+) if there is added summer moisture.

THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION

I have reproduced below the summary sheet of information about the Network. The concept of a co-ordinating organisation for integrated plant conservation in Australia has found wide acceptance and as of late 1992, there were nearly 100 members. A major initial project is the Endangered Species Collection, "a multi-site collection of living material of endangered plant species. It will be held as stored seed (or other germplasm), rooted cuttings, growing plants or any other living forms." Obviously, our Dryandra plantation at Cranbourne will be an important living collection and I intend to compile a list of the rare and endangered species that Margaret listed in Newsletter 22 which we are growing at Cranbourne for the next newsletter. This will nicely complement our member's holdings already noted.

One other function of the network co-ordinator is to produce a newsletter. The three issued so far contain several articles from various botanic gardens detailing their work in conservation as well as notes and discussions on specific species. Two techniques for propagating endangered species are tissue culture (for endangered species of *Phebalium* in South Australia) and "cryopreservation" (the storage of plant material at ultra-low temperatures such as that of liquid nitrogen at -196 C) which was applied to the very rare *Grevillea scapigera*. The modest success of this latter technique gives hope that it can be applied to other endangered species. Smaller botanic gardens such as at Mt. Annan in Campbelltown, NSW and the Black Hill Flora Centre in Adelaide are also actively researching both propagation techniques and developing data for optimum methods of replanting species back into the field. A particularly fascinating article by Dr. Andrew Smith of the University of New England dealt with rural eucalypt dieback in northern New South Wales and pieced together the very complex ecological web between eucalypts, scarab beetles, wattles and sugar gliders - the scarab beetles defoliate the trees but can be kept in check by sugar gliders which in turn require adequate food over winter of which certain wattles provide the best in the form of gum exudates. When man interferes (through cultivation or by running domestic stock which graze young wattles) the web is broken and dieback is the result.

THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION

Just over 200 years of European settlement has had a severe impact on Australia's natural ecosystems. The current estimate of extinct plant species in Australia is 74, with 178 species endangered and another 3234 under some degree of threat.

Fortunately the community is becoming more conscious of the need to protect global environments from the threats facing them. It is universally recognised that the preservation of habitat is the most desirable means of conserving the genetic diversity of all organisms, however some of these organisms are so threatened that the only means of saving them will be to secure them outside of their natural habitat until suitable places can be located to re-establish them. Some may have to be maintained permanently in ex situ collections. This complimentary role for ex situ conservation is now being referred to as **integrated conservation**.

In March 1991 the Australian National Botanic Gardens (ANBG), with support from the Endangered Species Unit (of the Australian National Parks & Wildlife Service) held a conference entitled "Protective Custody". The aim of the conference was to involve all organisations and individuals interested in plant conservation and to encourage co-operation between these organisations by the formation of a co-ordinating body for plant conservation. Delegates from Britain, Fiji, New Zealand, the Phillipines, Solomon Islands, the USA and Western Samoa also attended the conference.

During the conference, consensus was reached that Australasian Region does need a body to co-ordinate integrated plant conservation activities, and a proposal for the formation of the Australian Network for Plant Conservation (ANPC) was produced and widely accepted.

The ANPC will draw its membership from throughout Australia (in both public and private sectors) and will have a national office at the ANBG. It will be the co-ordinating organisation for integrated plant conservation in Australia. It will:

- i) establish a multisite National Endangered Species Collection for use in the practical recovery of endangered species by Recovery Plans, research, education, display and general horticulture.
- ii) locate and bring together information on integrated plant conservation activities in Australia and provide access to this information for members.
- iii) assist in the national co-ordination and priorities of plant conservation projects to avoid duplication
- iv) provide advice to members and promote plant conservation activities
- v) communicate on a regular basis by means of a newsletter.
- vi) organise workshops, training courses and conferences

For further information on the ANPC please contact the Director, Australian National Botanic Gardens, PO Box 1777, Canberra 2601.