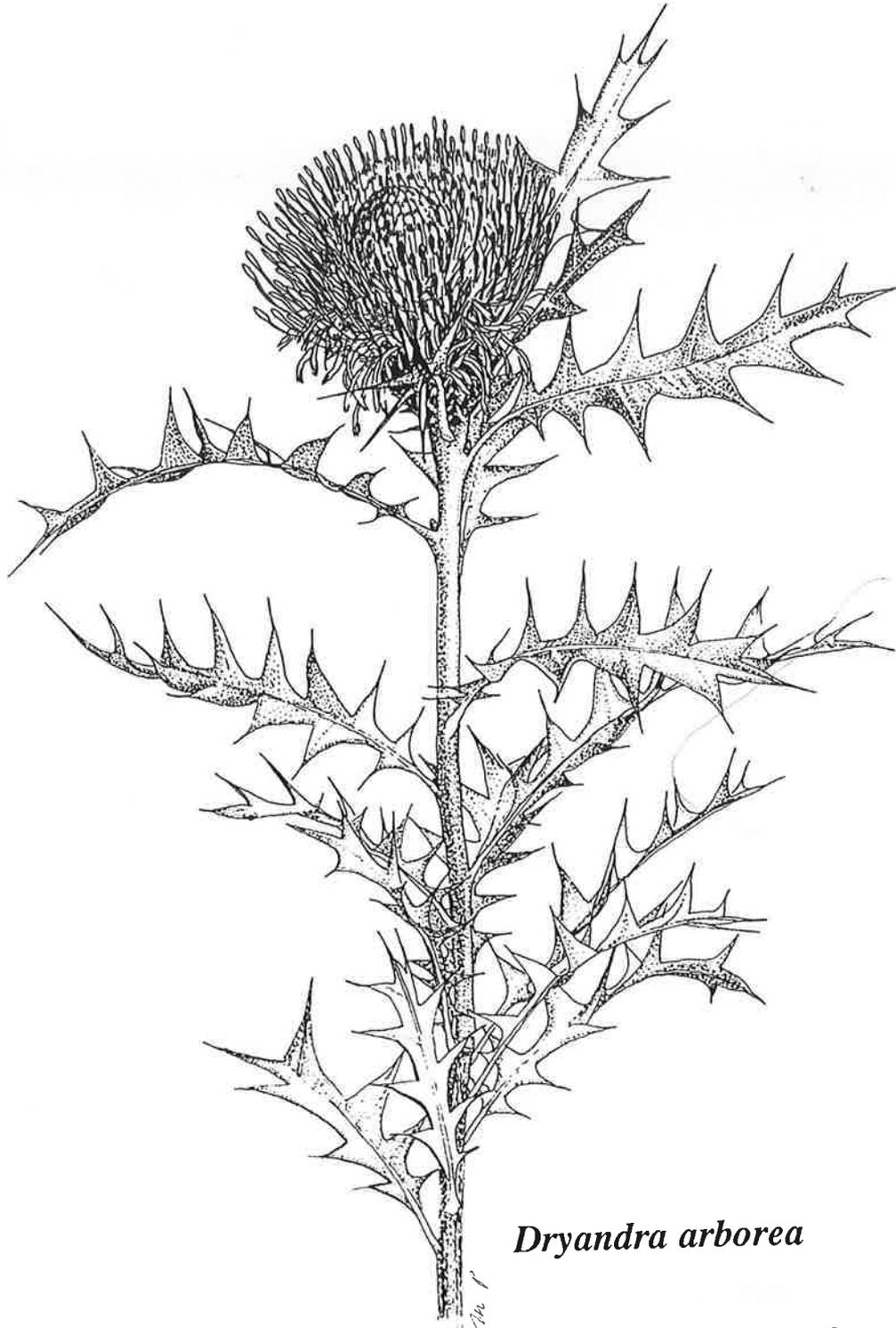


DRYANDRA STUDY GROUP

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Dryandra arborea

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DRYANDRA ARBOREA

This species is unique among dryandras being a tree up to 8 m tall with a thick trunk and deeply fissured bark. It is also the most inland dryandra and is found on the ironstone hills north of Southern Cross. It is successful in cultivation in warm, dry areas such as north eastern Victoria where plants reach large shrub proportions and flower and set seed.

DRYANDRA STUDY GROUP

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A happy new year to everyone. I hope that none of you were affected by bushfires over the last two months. It has been an extraordinary year for southern Victoria, very little rain and relatively hot summer. So far, no losses apart from one *D.arctotidis* (which I don't think died from the dry as other dryandras all around are thriving). As you will see from my article, I am also nursing about 60 small plants through the summer. I am hoping that most will survive.

Margaret has given us another excellent account of her trip to Eurardy station and country in between. The destruction of thousands of dryandras in the re-opened gravel pit north of Three Springs shows just how fragile many populations are. The very impressive list of plants currently growing in her garden is a challenge for all of us. David Randall, David Lightfoot and Elizabeth Brett also report on their gardens. Does anyone else have information on successes (and failures) especially of rare and endangered species?

I am very pleased to publish two articles by Lloyd Carman on his trips to the west and a letter from Brenton Tucker on the very important but little discussed topic of using fertilisers on natives when planting out. His results with ammonium nitrate are indeed spectacular as I was able to see first hand when I visited his nursery late last year. These three articles are reproduced with permission from the South Australian SGAP Journal and I would like to thank the editors, Eleanor and Kevin Handreck, for so readily allowing me to use them.

I have an article on spring versus autumn germination of dryandras, an old hobby horse. I have also included some more pages from the online version of *Australian Plants* by kind permission of the editor, Brian Walters. The large scale versions of the pictures are great on a colour monitor.

One of the recommendations which came out of a meeting of Study Group Leaders was that groups should publish a membership list and financial statement at least yearly. I hope you find these of interest.

And finally, there are still a number of outstanding subscriptions for 1997 - 1998. If an X appears in the box below, we do not have a record of your payment and this will be your last newsletter. Please pay Margaret as soon as possible.

Subscription owing for 1997-1998

Happy dryandra growing,


Tony Cavanagh
Newsletter Editor

Colourful Surprises - Return to Eurardy 14th-18th June '97

The timing could not have been better for my return visit to Eurardy Station to collect and photograph the dryandra that I had seen last year and mistakenly, as it turned out, identified as *D. fraseri* var. *oxycedra*. Margaret Quicke, of Eurardy had alerted me a week or so previously, that the dryandra was flowering three weeks earlier than usual. After many days of rain, the skies were almost cloudless and perfect for photography, when I set out accompanied by Shirley Loney to travel north beyond the Murchison River. The weather remained perfect for the whole trip.

At about 117 km's north of Perth we turned west off the Great Northern Highway on North Road. Not far along this road is by far the largest population known of *D. drummondii* subsp. *hiemalis*. Hundreds of plants are growing in a dis-used gravel pit now being used as a rubbish tip. Large mature plants occur in the lowest part of the pit and younger smaller plants with fewer, but more conspicuous flowers are spread up the sides and into the eucalyptus woodland to the north. Most plants were in flower. Although I have visited this site several times in the last few years it was the first time I'd seen the flowering at its best. The magnificent inflorescences with their golden yellow styles and rich rust or coppery brown limbs positively glowed in the rays of the low early morning sun. No need for the flash for photography, though I did get rather excited and had to carefully watch how many photos I could take. As usual, I could have done with more film!

We travelled north on the Midlands Road to Three Springs where I intended to collect a fresh specimen of *D. fraseri* var. *oxycedra* for comparison with the northern one. As I drove into the huge gravel pit on Lynch Road, north of three Springs, where Ann Cochrane and I had been shown a large expanse of the three dryandras that occur in the area, *D. borealis* subsp. *elatior*, *D. trifontinalis* and *D. fraseri* var. *oxycedra*, I was horrified to discover that the gravel is once more being removed and the thousands of dryandras have been destroyed. We found only two plants of *D. borealis* remaining on the edge of the large pit. Further along Lynch Road a second pit is again in use as well. In a small remnant of the original vegetation between the two excavations we managed to find one plant of *D. fraseri* var. *oxycedra* among a few of the other two species. Fortunately, all three are common in the Kadithinni Reserve south west of Three Springs but they are not now as prevalent as Ann and I reported three years ago.

From Three Springs we drove westwards to the Brand Highway where we spent the night at Western Flora Caravan Park north of Eneabba. We had booked accommodation for the fourth night there as well and, before leaving we arranged with Alan Tinker, who with his wife Lorraine runs this excellent facility, to spend some time botanising on our return. Alan, an ex Victorian, will no doubt be known to other Study Group members. He is an authority on the flora of the area who delights in showing it to botanists and other enthusiasts.

Having made good time on the second day, we decided to divert across to Burma Road south east of Geraldton, striking it at about 10 km's from the northern end. this road is very rich in rare and beautiful flora including *Banksia scabrella* which had almost finished flowering. We stopped to explore the dense heath and found some beautiful specimens of *D. sessilis* var. *flabellifolia* in flower, growing in a laterite rock depression. Among *Banksias leptophylla* and *scabrella* and other shrubs we found the low-growing *D. fraseri* var. *ashbyi*. One plant had a few pink flowers with smooth, almost hairless limbs and small dark brown glabrous seed follicles. The leaves are uniformly blue-grey, quite small, with the lobes quite close together. Nearby we were delighted to discover one plant of *D. shuttleworthiana* among many still in bud, with just one inflorescence open and two more, adjacent to it showing the colour of the limb. The colour was most surprising. Previously I had only seen this species with a cream perianth and brown limb surrounded by hairy bracts which are a rusty colour on the inside. The flowers of this plant were more numerous, so that the whole flower-head was more open and spreading and the colour of the limb a misty dark red. It looked more like *D. speciosa* than any *D. shuttleworthiana* I've seen before.

South of the Kalbarri turn-off I stopped to look at the roadside plants I'd photographed in 1983 and verified that they were the *D. fraseri* variety like those at Eurardy. Further south at Ogilvie East Road we'd seen some that had slightly shorter leaves and a more spreading habit. Perhaps they are grading into *D. fraseri* var. *fraseri*?

Hoping that *D. borealis* subsp. *borealis* would be at its flowering peak we drove towards Kalbarri. This is another species which, except at Cranbourne, I had only seen once before in flower and then only at the end of the season when only a few plants were sparsely flowering. 23 km's along the road we found the population quite easily. The golden yellow flowers are very striking although the shrubs are quite small and spreading compared to subsp. *elatior*. In the white sand and laterite, growing with the dryandras are other medium to

large shrubs some of which were flowering, such as *Hakea orthorryncha* and *H. pycnoneura* and *Grevillea dielsiana*. It promises to be another very good wildflower season this year. *D. borealis subsp. borealis* is a beautiful species, Neil Marriott's favourite, I believe. The inflorescences, slightly smaller than *subsp. elatior*, are more colourful because the bracts, almost as long as the flowers, are golden yellow tipped with rusty-brown hairs on the outside whereas *subsp. elatior* has greenish yellow bracts. Both are very attractive and quite floriferous. Though some of the plants were still in bud others were indeed at their peak so, once again, this time in perfect afternoon sunlight, the camera was in action.

The following day at Eurardy Margaret Quicke took us "bush-bashing" in the mustering utility to the northern boundary of their vast property and part of Kalbarri Park. Though the station is north of the Murchison River much of the vegetation is similar to the Kalbarri National Park most people visit, with sandy ridges supporting an immensely rich and varied flora which includes *Banksias ashbyi*, *sceptrum* and *lindleyana*, *Grevilleas candellabroides*, *annulifera*, *gordoniana*, *dielsiana* and many more. A glorious array of verticordias and pileanthus flower in spring and *Beaufortia squarrosa* in all its colour forms in spring through summer. Although Margaret described our journey as "bush-bashing" we were in fact on a formed track but the past few seasons have been so good that the vegetation had almost over-grown the track. There are several populations of the dryandra on the station. On the way to the remote one Margaret showed us one plant growing near the fence line at the edge of their wheat field which is enormous, 3 metres high and more than 4 metres wide. There were quite a few dryandras in flower at the end of our ride. I was interested to see that, beyond the boundary fire-break, was an area that had been burned about 2 years ago. The dryandra was one of the plants that had not been killed by fire and re-sprouted plants were flowering. This was a characteristic that Alex George was keen to verify, whether or not this variety of *D. fraseri* had a lignotuber or not. In general the habit is very upright with numerous long branches with crowded leaves, branching from near the ground similar to *var. oxycedra*. *Var oxycedra* does not have a lignotuber, the leaves are more crowded and the lobes are slightly narrower. Seed follicles in both are narrower than other varieties. Interestingly, seeds I sowed of the Eurardy dryandras germinated very well and in much shorter time than any other except *D. arborea* - just over 2 weeks.

We spent a delightful day being shown around the property by Margaret who, having finished the crop sowing was pleased to have the time to spend with us. We appreciated it very much, needless to say.

Back at 'Western Flora' the next day, Alan joined us as we drove a short distance north on Brand Highway and turned onto a road leading to a dis-used gravel pit about 6 km's east. I was hoping to find *D. fraseri var. ashbyi* in flower even though it was rather too early in the season. This time it was rather too much to expect, but, we did find that some plants had a few buds almost beginning to open and they were very dark pink. I have seen pink flowers in *var. fraseri* and very occasionally in *var. oxycedra* and quite often in *var. ashbyi* but never before such a deep pink. When the flowers are fully open the colour will not be as bright but, as with the pink *D. praemorsa*, some are pinker than others. I'm sure that in a week or so these dryandras will be absolutely stunning. The plants are compact and the blue-grey leaves are most attractive. This variety, in my opinion is the best one for the garden.

The more I see of *D. fraseri* the more variations I seem to find. I think there are probably some intermediate ones as well, among those with a lignotuber.

Many thanks to Alan and Lorraine Tinker and Bruce and Margaret Quicke. I can thoroughly recommend both of their places to anyone visiting WA. Book your accommodation in advance.

Margaret Pieroni
July 1997

DRYANDRAS IN MY GARDEN AT 15 JULY '97

My garden has recently been enlarged as I have removed most of the lawn at the back of the house. The area doesn't get much sun in winter as the house faces north. Fortunately dryandras do not mind some shade. Some well-established plants are flowering for the first time as I, and my neighbour, have reduced the canopy of mature trees as well.

In February I obtained a number of plants from Kevin Collins which I planted as soon as the winter rain started. All except *D. drummondii* subsp. *macrorufa* are doing well, most starting to put on new growth. I have marked these KC.

In May, the Friends of Kings Park had a plant sale and, among many other genera several dryandras were available. These plants were grown on in the nursery from seedlings supplied by Anne Cochrane from the dept. of CALM seed collection of rare and priority species. Unfortunately all of these were horrendously pot-bound. I purchased 6 of them (marked KP) to 'give them a good home'. Only one has put on new leaf growth so far. I have top-pruned only one - *D. comosa* as I'd like it to be bushier. The rest are one or few-stemmed and there's no room for them to spread. It would probably have been better to have pruned them all, given that the roots are so dense and matted.

Many of the species I have growing are doing well in gardens in Victoria and South Australia. Some of these I have marked with a *.

* *D. acanthopoda*

KP. 35 cm X 25 cm wide

D. arborea

Growing well after a slow start. It has reached 2.5 m X 1 m with 3 trunks from ground level. It flowers all year round and has set seed.

D. arctotidis

Still only 20 cm X 20 cm this plant is just surviving. It has not flowered.

? *D. armata* var. *ignicida*

KP. Labelled *D. armata*. This plant has one upright stem 70 cm tall so its identification is uncertain. It could be *D. purdieana*.

D. bipinnatifida

20 X 55 cm. Doing well, this plant has flowered (8 inflorescences last year) but has not set seed.

D. borealis subsp. *elatior*

KP. 40 X 15 cm. New leaf growth.

* *D. brownii*

30 X 30 cm. Only 2 years old, this plant is a replacement for my first one which grew very well but never flowered.

D. calophylla

A two year old plant is 30 X 30 cm and a one year old half the size. This is the most successful direct-seeded species, growing vigorously where the seed was sown in the garden.

* *D. comosa*

40 cm X 25 cm (top-pruned) KP. Labelled *D. kippistiana*.

* *D. conferta*

KP. 30 X 25 cm. This plant also was mis-labelled. I'm hoping it will turn out to be the blue-grey leaf form (ASG 31) which is so attractive and rare in the wild.

D. cuneata

1.5 m X 1.5 m. I have had this plant many years and it has been pruned several times but it has yet to flower.

* *D. drummondii* subsp. *drummondii*

A two year old plant is 30 cm X 30 cm. It replaces one that died after many years flowering and setting seed.

D. drummondii subsp. *macrorufa*

KC. 10 cm X 20 cm. Not doing as well as I'd hoped.

D. drummondii subsp. *hiemalis*

KC. 20 cm X 25 cm. Doing well in shade - has made new growth.

D. falcata

50 cm X 25 cm. This is doing well and is in bud for the first time after several years slow growth.

D. ferruginea subsp. *pumila*

40 cm X 66 cm. A very rewarding plant, this one is about 10 years old. It flowers prolifically and has set some seed.

D. fililoba

50 cm X 90 cm. A fast-growing, dense mounded shrub, this has flowered well but has not set seed.

D. foliosissima

80 cm X 80 cm. I have given this plant extra summer water and iron chelates to correct yellowing leaves. It is growing well and has had flowers for the last two years but has not set seed.

* *D. formosa*

2m X 2m. Easily the hardiest and one of the most attractive dryandras, this grows fast and dies early in my garden. This plant has flowered and set seed. I have three other small plants to replace it.

D. fraseri var. *fraseri*

60 cm X 80 cm (2 plants). Among the oldest dryandras in my garden, these plants have flowered and set seed.

D. fraseri var. *oxycedra*

KP. 30 cm X 20 cm.

D. fraseri var. *ashbyi*

10 cm X 15 cm. Slow growing, has not yet flowered.

D. fraseri var. "Lesueur"

20 cm X 25 cm. As above.

* *D. ionthocarpa*

25 cm X 35 cm. This is not doing well despite summer watering. Nethertheless it has flowered but did not set seed.

* *D. lepidorhiza*

30 cm X 40 cm. A rare species in the wild but apparently one of the hardiest of the prostrate ones in cultivation. My plant has not yet flowered.

D. lindleyana subsp. *lindleyana* var. *lindleyana*

30 cm X 1.5 m. One of my oldest plants and occurring in the local bushland, this plant has grown well. It has flowered but has not set seed.

D. lindleyana subsp. *lindleyana* var. *mellicula*

40 cm X 80 cm. As above.

D. lindleyana subsp. *agricola*

25 cm X 40 cm. Slow growing about 10 years this one has still not yet flowered.

D. lindleyana subsp. *media*

I've included this one even though two plants I have are still very small - from seed sown last year, because it seems to be very hardy. These were almost the only dryandras to survive to planting out.

* *D. meganotia*

20 cm X 40 cm. The last surviving plant of three is in bud for the first time.

D. mimica

30 cm X 30 cm. At 8 or 9 years old, this is still growing well. It has flowered for 6 years but has not set seed.

D. mucronulata subsp. *mucronulata*

2 m X 3m. An excellent fast growing screening plant, mine has flowered and set seed after only two or three years.

D. mucronulata subsp. *retorsa*

20 cm X 15 cm. This plant has yet to flower. Another, accidentally killed, had flowered after just a few years.

D. nivea var. 'Morangup'

20 cm X 20 cm. KC.

? *D. nivea* Woogenillup Rd

0.5 m X 0.5 m. This plant, with very attractive foliage, has been growing well for many years but has not yet flowered.

D. nobilis subsp. *nobilis*

1m X 60 cm. Still a young plant with one upright stem, this has still to flower.

D. nobilis subsp. *fragrans*

1.2 m X 1.6 m. Fast growing, with beautiful orange-blossom scented flowers, this is one of my favourites. It has flowered but has not set seed because I picked the flowers!

* *D. obtusa*

20 cm X 65 cm. Another of my older plants - flowers well and has set seed.

D. platycarpa

50 cm X 25 cm. Doing fairly well - has yet to flower.

D. plumosa subsp. *denticulata*

0.5 m X 1 m. After a slow start, this plant is growing rapidly. It has flowered but has not set seed.

D. polycephala

2m X 1.5 m. I have three plants flowering well and setting seed, as well as numerous self-sown seedlings.

D. porrecta

30 cm X 80 cm. This is a good ground cover which has flowered well from an early age. It has not set seed.

* *D. praemorsa* var. *praemorsa*

2 m X 1 m. A self-sown plant from a deceased one, this flowers well and self seeds in the garden.

* *D. praemorsa* var. *splendens*

1 m X 2 m. This was grown from seed labelled 'pink form'. The flowers unfortunately are not pink but it sets seed readily.

* *D. pseudoplumosa*

KC. 15 cm X 5 cm.

D. pteridifolia subsp. *pteridifolia*

KC. 20 cm X 20 cm.

D. pteridifolia subsp. *vernalis*

15 cm X 10 cm. Older than the above and struggling.

D. seneciifolia

80 cm X 60 cm. Flowering for the first time, this plant is growing very well. It is about 4 years old.

D. serra

50 cm X 10 cm. A self-sown seedling from an earlier fast growing free-flowering plant, this single-stemmed plant has still to flower.

D. sessilis var. *cygnorum*

1.5 m X 1 m. Another local plant, this is only three years old and is about to flower for the first time.

D. speciosa subsp. *macrocarpa*

KC. 20 cm X 10 cm. My original plant has died so this is a replacement. I hope this years seedlings will survive to plant out, so that, when they flower they will also set seed. More than one plant seems to be needed for this to occur.

D. squarrosa subsp. *argillacea*

1.8 m X 1 m. This is several years old but is flowering for the first time. It has been in quite a deal of shade until recently.

D. stricta

40 X 30 cm. Several years old, this plant is inexplicably slow-growing so far.

D. subpinnatifida var. *subpinnatifida*

1.5 m X 1.5 m. This plant in full sun, is a great performer. Its dark green leaves with red new growth is very attractive when not in flower. It has been flowering and setting seed for several years.

D. subpinnatifida var. *imberbis*

20 cm X 25 cm. Slow growing so far, this plant has yet to flower.

* *D. tenuifolia* var. *tenuifolia*

1.2 m X 2 m. The oldest dryandra in my garden, this has done well, flowering and setting seed readily. I have had to prune it several times to keep it from over-growing other plants.

* *D. tenuifolia* var. *reptans*

15 cm X 2 m. Another very good ground cover with showy flowers, this is growing and flowering very well and has even set a few seeds.

D. tridentata

32 cm X 17 cm. After many years of very slow growth this plant is starting to move. I hope it will flower soon.

* *D. viscida*

KC. 20 cm X 20 cm. I hope this will grow as well as those at Royce Raleigh's garden in Victoria!

Margaret Picioni

"HI-VALLEE", W.A., SEPTEMBER, 1996

Lloyd Carman, Eden Hills

What a wonderful surprise was our visit to "Hi-Vallee", an ECO farm property which is owned by Don and Joy Williams. Don conducts tours of the property for people with an interest in wildflowers, native birds, bushwalking, camping, farming, photography, or just nature itself. He also leads tours into interesting neighbouring areas.

"Hi-Vallee" is situated approximately 250 km north of Perth. It is between Badgingarra and the Half-Way Mill Roadhouse, about 5 km east of the Brand Highway along the Tootbardi Rd. A portion of the property is set aside as grazing land, and a small section is for crops. The remaining land is quite extensive virgin bushland.

The terrain and soil type varies considerably, from hilly areas of laterite ironstone to areas of sandplain, with richer loam soils reserved for farming. This variation in elevation and soil type produces a wide variety of flora which is remarkable in its diversity.

The main reason for our visit was an invitation from Margaret Pieroni (Dryandra Study Group Leader) to accompany her on a field trip to seek out the 21 species of *Dryandra* that are listed for "Hi-Vallee" and to look for a new species that was reported to be growing there.

The day before had been wet, and we woke to the sound of pouring rain - not a good omen for a field trip! However, Don Williams assured us that it would pass over... and it did, though we were left with heavy cloud in the sky (which was not good for photography)!

At the homestead, we met up with 8 visitors from Western Australia. Most were from the Wildflower Society of W.A., so we found ourselves in good company that made for a most enjoyable time.

The convoy of cars stopped at the foot of a hilly, wooded area where there was an abundance of a great variety of wildflowers. In amongst the plants was an extensive stand of *Dryandra nobilis* ssp. *fragrans* (so named because of the sweet fragrance that is given off by the newly-opened flowers) in full flower.

Other plants of interest were *Dryandra carlinoides* with a blush of pink to its creamy-yellow flowers, and a prostrate *D. tortifolia* with its fishbone-type leaves. *Beaufortia bicolor* with its red and yellow flowers, and various *Acacia* and *Daviesia* species were making a splash of colour. We also saw *Petrophile striata*, *Tetratheca setigera*, the pretty red

flowers of *Astroloma microdonta*, the yellow-flowered *Hypocalymma linifolium* and the most unusual *Darwinia speciosa*, a prostrate plant with flowers that are covered by red bracts.

Further along, we came across an ancient stand of palm-like *Macrozamia riedlei*. On this plant, we witnessed an amazing occurrence. About 1 metre from the ground, we saw what appeared to be masses of green grass growing amongst the older fronds. In actual fact, they were plants of *Diuris longifolia* (Donkey Orchid), with some flowers still persisting.

We went to a wooded area where there were a number of different eucalypts. Some of these species, for example, *Eucalyptus gittinsii*, *E. lateritica*, *E. leprophloia* (the only known population), and the relict species, *E. suberea*, are rare and unusual. Another interesting plant was *Diplolaena ferruginea* with its red rose-like pendant flowers and dark glossy green leaves.

Higher up on a plateau was a typical sandplain area where there were a number of *Banksia* species (10 are listed). One that is not well-known is *B. chamaephyton*, a prostrate plant with bluish-grey, deeply-divided leaves. We also saw *B. candolleana*, which has attractive yellow (or sometimes pink) flowers and unusual propeller-like fruits. There were a number of smokebushes, including *Conospermum nervosum*, a dwarf species with blue flowers, and the delightful *C. incurvum* that is prized as a cut flower. Other plants included *Petrophile linearis* with its lovely grey-pink flowers, *Synaphea polymorpha*, *Lechenaultia hirsuta* (an outstanding red-flowered plant), and almost-prostrate plants of *Lachnostachys eriobotrya* (Lambs' Tails). In other areas, there were grevilleas, verticordias, dampieras, calytrix, isopogons, petrophiles, and hakeas (18 *Hakea* species listed). The list includes *H. neurophylla* which, with its delightful pink flowers, is one of the loveliest hakea species. Most of the flowers had finished but a few late ones remained.

Apart from the stunning flora (and there are lots that I haven't mentioned), there were magnificent views from the high country. As we reluctantly returned to the homestead in the late afternoon, we passed mobs of kangaroos that were quietly grazing in the paddocks below us. This visit was a wonderful experience and a highlight of our trip to Western Australia. We would heartily recommend a visit to "Hi-Vallee".

If you are planning to visit "Hi-Vallee", remember to book well in advance as the property is now very popular... and accommodation there is limited. For more information, contact Joy or Don Williams on (096) 52 3035, or write to them at "Hi-Vallee", Tootbardi Rd, Badgingarra, W.A., 6521 ☺

EXPLOITS IN THE WEST AND A TASTE OF FIRE

Lloyd Carman, Eden Hills

In our trips to Western Australia, there are some places that we consider to be very special. These include the Stirling Ranges National Park and the Fitzgerald River National Park. Before we left home in September 1996, we had heard that a fire had swept through a section of the Stirling Ranges, but where or how much had been burnt we did not know. We did not expect that most of the accessible part of the National Park would still be intact; but how wrong we were.

Our journey into the Stirlings was *via* Cranbrook and Salt River Road, and then onto Red Gum Pass Road. Everything was pretty much as we remembered it, with thousands of young plants of *Dryandra drummondii*, plus other dryandras (e.g. *D. armata*, *D. aff. falcata*, *D. arctotidis*, *D. nervosa*, *D. sessilis* and *D. tenuifolia*), and *Banksia acculeata* and *B. coccinea* (flowering well) near the intersection. Down the slope of a steep road-verge, we were surprised to find what I think was *Dryandra pseudoplumosa*. There were also attractive species such as *Burtonia scabra* (reddish-pink) and *Isopogon baxteri* (pink). When it is in flower, it is one of the most attractive isopogons.

We then drove into Stirling Range Drive, where we saw the beautiful *Darwinia oxylepis* (Mountain Bell). *D. oxylepis* grows in a valley that is not far along Stirling Range Drive. Growing to about 1 metre high, with large, bright red bells, it was a joy to behold. At the Baby Barnett Hill Lookout there was a multitude of flora, including handsome specimens of *Hakea baxteri*, *H. ferruginea* (a mass of white flowers) and *Dryandra foliolata* (in bud and with attractive soft, fluffy brownish new growth). We also saw *D. cuneata*, *Banksia grandis* and *Actinodium cunninghamii* (Swamp Daisy) at the Lookout.

But, of course it couldn't last. Too soon we came to the burnt area on the southern side of Stirling Range Drive. Here there were just blackened sticks and ash. Some distance down the road, the fire had jumped the road. That was the end of our hopes for seeing flora. It was in this area that we had hoped to revisit *Darwinia wittwerorum* - a rare species that was first discovered following regrowth after a fire that occurred some years ago. The burnt area continued like this for about 35 km as we travelled eastwards to eventually meet the intersection with Chester Pass Road.

* Margaret identified this from a photograph

The fire had been stopped at the intersection of Stirling Range Drive and Chester Pass Road, so we thought that we would drive onto Mt Trio, where we knew of a delightful area where *Isopogon latifolius* and *Darwinia lejustyla* grew in profusion. But that area had been burnt out as well! On a road-verge that had escaped the fire, we found a stand of *Beaufortia heterophylla*, with its brilliant red brushes shining in the sunlight. In the same area, we also found *Conospermum dorrieni*, a beautiful blue-flowered smokebush. Unfortunately there was little else to see.

Our next call was Bluff Knoll, which had escaped this latest fire, but which had been burnt out just prior to our previous trip in 1991. There was good regrowth in some parts. We were lucky to see *Isopogon baxteri*, *Xanthosia rotundifolium* (Southern Cross plant), *Dryandra brownii*, *D. formosa*, *D. armata*, *D. cuneata*, *Kingia australis* and the white-flowered *Sphenotoma drummondii*. Most of the flora was rather stunted, which is the tendency for plants which grow at high and exposed altitudes.

Following the fire (i.e., in the coming spring of 1997), visitors could expect to find many species of orchids and other flowering plants that have not been seen for years. This would apply particularly to those species that rely on fire to provide them with the space, sunlight and reduced competition that a bushfire provides.

After leaving the Stirling Ranges, we visited the Fitzgerald River National Park. Almost half of this huge Park was burnt following hundreds of lightning strikes (and subsequent wildfires) in December, 1989. In the following year (October 1990), a survey found about 100 species of orchids, including 20 new species and 8 hybrids. Another remarkable find was *Anigozanthos onycis* (Branched Catspaw) which had not previously been recorded in the Park, but which now covered a sizeable area.

We had last visited the Fitzgerald River National Park in 1991. At that time, we found that the flora was slow to recover. We saw plants such as *Lechenaultia formosa*, *L. heteromera* (blue), *Chloanthes coccinea* (scarlet-red), *Scaevola* and *Dampiera* species (which were flowering well), and miriads of small seedlings of various *Banksia*, *Dryandra* and myrtaceous species.

By October 1996, the scene had been transformed. The banksias were in fruit, the dryandras were flowering and *Regelia velutina* was showing off its striking red brushes. Of course, hundreds of other species were also growing well.

At East Mt Barren, we enjoyed a most wonderful experience while we were walking amongst hundreds of *Pimelea physodes* (Qualup Bells) which were mostly up to 1 metre high and which were covered in "bells". The attractive "bell" is made up of many small flowers which are enclosed by large petal-like bracts that are yellow and streaked or capped in red. On our earlier trip (before the 1989 fire), we were lucky to see more than a few of these plants at a time. Those that we did see were mostly growing near West Mt Barren. They were lean, lanky plants that were up to 2 metres tall.

Bushfires can be very destructive, particularly in small areas of bushland. But they can also rejuvenate the flora and bring new life to an area, provided that sufficient time is allowed for plants to reach maturity and that seed production is at the required level to ensure that the species can survive. ☼

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Did you know? The galls which are commonly seen on many Australian *Acacia* species are not the result of insect attack, but are the result of infection by the endemic Australian rust fungus *Uromycladium tepperianum*. ☼

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LETTER TO THE EDITORS

From: Brenton Tucker, Tailem Bend

I am responding to Kevin's request (*Kweschn Korna with Kevin, S.G.A.P. Journal, May 1997, p. 55*) to hear from anyone who has had first-hand experience of the effects of applying fertilisers to young Australian plants at planting-time.

My current garden is between Tailem Bend and Wellington, where the average annual rainfall is 350 mm. The soil is a quite infertile, low nutrient-holding, pH-neutral sand over a limestone layer which is some 0.3 - 7 metres below the surface. I have adopted the practice of applying half-to-one 35 mm film canister of fertiliser per plant into the bottom of the hole at planting-time. The rate of application depends on the container-size of the plant: I use 1/2 container of fertiliser for a plant from a 75 mm ("SGAP-sized") pot, to one canister for a 125 mm (5") or 150 mm (6") pot.

The fertiliser must be in the bottom of the hole:

1. To avoid "rolling" or blowing away, and also to avoid giving a boost to any errant weeds which germinate close to the plant.
2. So that later watering with a dripper is more likely to contact the prills that are close to the plant. This is important early on when the plant's roots are growing into the soil.
3. Because I believe that the release period is longer if the slow-release fertiliser is below ground. The soil temperature at 6 - 8 inches underground is lower than that on the surface.

Initially, I used Nutricote Brown 16:4.4:8.3 (12 month nominal release-time). I later used Nutricote Brown plus quantities of mineral mix. About 14 months ago, I switched to Nutricote Total 18:2.6:6.6 TE (with trace elements) (270 days nominal release period). I am now also trying Osmocote Plus TE (with trace elements) 17.1:1.6:8.7.

Most of my plants are planted in the hotter months of the year; they are given a weekly watering for about 4 weeks and then a monthly watering until winter. The following summer, slow drip-watering of 5 - 6 hours is given at intervals of 4 to 8 weeks, depending on summer rain. The irrigation water contains 400 ppm salt. I have had to provide follow-up fertiliser to some of my earlier plantings.

Based on advice from PISA, chamelauciums, callistemons, melaleucas, kunzeas, ricinocarpus, thryptomenes, eriostemons and

some grevilleas were treated with 1/4 - 1/2 x 450 g tin of ammonium nitrate. This was applied immediately before rapidly-deposited rain (in January, 1997, when 25 mm fell). The results were spectacular, as *Thryptomene saxicola* "Pink Lace", *Melaleuca hypericifolia* "Ulladulla Beacon" and *Grevillea lanigera* (dwarf) went, in 2 - 4 weeks, from virtually bare sticks which were near death to healthy green plants. After 3 - 4 months, the thryptomenes were in full flower. The *Chamelaucium* spp. greened up enormously and are now (early July) fully laden with gleaming buds.

My 1996 experience with planting out (in June and July) several thousand mostly forestry-tube stock with Nutricote Total, **not** watering in, and with **no** additional water (even during the long, hot dry from October 1st, 1996 to May 1st, 1997, except for a few very light falls and the 25 mm that fell in January as was mentioned above) runs against Kevin's prediction regarding the death of the plant during its first summer. In fact, the loss rate was 5%. Some or much of this is attributable to transplanting and just plain lack of water. The 95% that survived are, after 10 months, 8 - 15 inches high. These plants were all current stock which were planted when they were small.

Please note also that the Nutricote Brown and Nutricote Total, having some (albeit low) phosphorus, were used on banksias and dryandras at planting out with no apparent problems. ☼

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S.G.A.P. Dryandra Study Group
List of members as at 31/12/1997

Keith Alcock, Deakin West, A.C.T. 2500
Elizabeth Brett, Corowa, N.S.W. 2646
Barbara Buchanan, Myrree, Vic. 3732
Lloyd Carman, Eden Hills, S.A. 5050
Tony Cavanagh, Ocean Grove, Vic. 3226
Anne Cochrane, Como, W.A. 6152
Phil Cockburn & Peter Cornock, Waroona, W.A. 6215
Kevin and Cathy Collins, Mt. Barker, W.A. 6324
Mrs. K. Cornwall, Mt. Eliza, Vic. 3930
Dennis Craig, Bunbury, W.A. 6230
Val Crowley, Darkan, W.A. 6392
Bob Drummond, Langwarrin, Vic. 3910
Max Ewer, Avenue Range, S.A. 5273
Alex George, Kardinya, W.A. 6163
Elizabeth George, Alexander Heights, W.A. 6064
Kevin Handreck, Netherby, S.A. 5062
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David Lightfoot, Croydon Park, N.S.W. 2133
Claire Lithgow, Parrakie, S.A. 5301
Shirley Loney, Daglish, W.A. 6008
Nei Marriott, Stawell, Vic. 3380
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Leonie Monks, Roleystone, W.A. 6111
Helen Morrow, Bulleen, Vic. 3105
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Don & Joy Williams, Badgingarra, W.A. 6521
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Editor, *Australian Plants*, Sydney, N.S.W.
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Maroondah, Vic.
New England, N.S.W.
New South Wales.
Queensland.
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W.A. Wildflower Society.
Victoria.
Tasmania.

Dryandra Study Group

Financial Statement 1.7.96 - 30.6.97

	Cash at bank as at 1.7.96	\$1666.21
Income	Members subscriptions	390.00
	Donations	74.00
	Sales of back newsletters	20.00
	Sales Occasional Publication no. 3	422.00
	Bank Interest	21.76
		<u>927.76</u>
	Total	<u>2593.97</u>
Expenditure	Newsletter and O.P. no. 3 expenses	400.00
	Bank charges	1.85
	A.N.P.C. subs	50.00
	Postage, photocopying, stationery	156.00
		<u>607.85</u>
	Less petty cash in hand	6.10
		<u>601.75</u>
	Cash at bank as at 30.6.97	<u>1922.22</u>

Note: Due to a reminder notice, overdue subs and payments for more than one year in advance were received.

News from Members

From David Lightfoot, Croydon Park, N.S.W.

I have had some minor success recently with my *D. formosa* in the garden which is now about on metre high and looking very healthy. I have lots of seedlings of *D. bipinnatifida* and *D. fraseri* as well as some of both the pink and yellow forms of *D. praemorsa*.

My *D. drummondii* is still healthy in its pot but for us, summer is always a problem and I hope that they will all survive.

From Elizabeth Brett, Corowa, N.S.W.

I am afraid that gardening has had to take a second place for me over the last two years. What with floods in 1996, house extensions last year and a record dry autumn, very little has been planted. I lost quite a few dryandras over the very long, hot and dry summer of 1996-1997 and I can't really work out why. At first I thought too much water, then not enough water, but as the ones that died were surrounded by ones that survived, it is all a bit of a puzzle.

From David Randall, Cobram, Victoria.

My current job does not allow me the time that I would like to spend in the garden but I thought that you might be interested in what has survived for me with almost no attention.

D. acanthopoda is 0.6x0.6 m but hasn't flowered; *D. bipinnatifida* ssp. *multifida* has flowered and survives in a very tough position; *D. borealis* ssp. *borealis* is 0.3x0.4 m and has flowered but not set seed; *D. borealis* ssp. *elatior* 1x1 m, flowered but not set seed, half bush died over summer; *D. brownii* 0.2x0.3 m, has not flowered; *D. conferta* var. *parva* 0.4x0.6 m, flowered but not set seed; *D. drummondii* "Big Red", 0.2x0.2 m struggled through last summer, not yet flowered; *D. fraseri* 0.3x1.5 m, flowered but no seed; *D. fraseri* var. *oxycedra* 1.3x1.0 m flowered but not set seed; *D. lindleyana* ssp. *agricola* 0.1x0.3 m, struggling; *D. montana* 0.15x0.3 m has not flowered; *D. obtusa* 0.3x0.5 m flowered but not set seed; *D. polycephala* planted early 1996; *D. sclerophylla* planted early 1996; *D. serratuloides* do not expect to last through the summer; *D. sessilis* var. *cygnorum* 1.5x2.0 m flowered in mass, many seeds; *D. shanklandiorum* 0.7x1.0 m flowered but not set seed; *D. shuttleworthiana* 0.2x0.2 m has not flowered; *D. viscida* 0.6x1.0 m flowered but not set seed.

Over last summer, I lost some well-established plants (or so I thought) - *D. drummondii*, *D. proteoides* etc.

I am also trying some plants in my mother's garden. These are ones that I do not have-

D. arctotidis; *D. calophylla*; *D. carlinoides*; *D. echinata*; *D. fililoba*; *D. formosa*; *D. longifolia*; *D. quercifolia*; *D. plumosa*; *D. praemorsa*; *D. proteoides*; *D. seneciifolia*; *D. subpinnatifida*.

News from Hi-Vallee

Don and Joy Williams have reported the discovery of a dryandra that they didn't know was growing on their property - *D. tridentata*, growing in sand at the northern end of their farm. They also found a "new" hakea and an acacia, gazetted rare flora that had been lost.

This brings the number of naturally-occurring dryandras at Hi-Vallee to a nice round 20. I had hoped to be able to report a twentieth one last year when we went to look at plants of which Don and Joy had sent me several leaf samples. What I thought could be *D. cypholoba* or *D. lindleyana* subsp. *media*, or both, turned out to be *D. stenoprion* X *nana*. On an earlier visit, I had found a hybrid plant growing among its parents but at this different location, there is a hybrid swarm which explained the variation in the leaf samples.

Margaret Pieroni

Germination Revisited - Autumn versus Spring

Over many years in the Newsletter, there have been comments about the "best" time to germinate dryandra seed. In both South Australia and Western Australia, there appears to be reasonable consensus that autumn is best, say late March, early April. In Victoria (and probably Tasmania), there appear to be advantages with early spring sowing (say late August, early September). I have had very few reports from Queensland and New South Wales but because of their milder winters (and high summer humidity) I believe that the most appropriate time would be early autumn.

So, what are the advantages and disadvantages of autumn versus spring sowing in Victoria, in particular southern Victoria (ie south of the Great Dividing Range). I make this distinction because the winter and summer climates of northern Victoria are different to those of the southern area. North of the Divide, winters are colder (more frosts, lower minimum temperatures) but also they often have warmer winter days (higher average maximums) and more hours of sunshine which I believe is critical in successful germination. By contrast, in summer the northern areas are frequently very hot, dry and sunny, and I for one would not want to be trying to bring small plants through this period. Dryandras, like most others of the Proteaceae, germinate best in cooler (not necessarily cold) situations and probably the small plants thrive better in milder rather than hot weather. As anyone who has experienced a (southern) Victorian summer will tell you, it is rarely hot for long periods (in fact, it is rarely hot, period) and providing you can keep an eye on your plants in those occasional hot spells, it is possible to raise dryandras and banksias in spring and have them ready for planting in April.

I must admit that I have had a few disasters in the past when I failed to water the pots before a very hot day and lost 80% of my seedlings on that day. This summer is a very good test of my theories as we have had an exceptionally dry year (second driest

on record) and the whole gamut of days of total fire ban in early December, days over 40°C, floods, and torrential downpours out of nowhere. And my banksias and dryandras are still surviving! (at last on the 18th of January they were). I also sowed seed this year in April and the tables below compare the germination times for autumn and spring sowings and give some idea of the relative sizes of average plants for each of the sowings.

Seed sown 28/4/97.

Species	Germination time (days)	Approx. height (cm) 18/1/98
<i>D. arctotidis</i>	47	8
<i>D. baxteri</i>	47	13
<i>D. calophylla</i>	39 - 47	prost
<i>D. conferta</i>	61 - 74	8
<i>D. drummondii</i>	36 - 61	prost
<i>D. ferruginea</i> * (lge)	39 - 47	prost
<i>D. formosa</i>	36 - 47	12
<i>D. nivea</i>	39 - 47	prost
<i>D. nobilis</i>	36 - 61	8
<i>D. obtusa</i>	61	prost
<i>D. polycephala</i>	39	25
<i>D. praemorsa</i> (dwarf)	36 - 47	12
<i>D. praemorsa</i> †(pink)	32 - 47	12
<i>D. pulchella</i>	61	5

**D. ferruginea* ? ssp. *tutanningensis*

†*D. praemorsa* var. *splendens*

Seed sown 12-13/9/97.

(Banksia and Dryandra seeds).

<i>B. baueri</i>	35 - 60	3 - 6
<i>B. cuneata</i>	35 - 42	3 - 6
<i>B. microtheca</i>	35 - 42	3 - 6
<i>B. ornata</i>	35 - 60	3 - 6
<i>B. praemorsa</i>	56	3 - 6
<i>D. formosa</i>	35 - 42	3 - 6
<i>D. longifolia</i>	35 - 42	3 - 6
<i>D. nobilis</i>	35	3 - 6
<i>D. praemorsa</i>	35 - 42	3 - 6

While I have had some losses from both batches, they have not been excessive and all plants are still looking healthy. I know members will hate me for saying this but I simply do not have problems with damping off. I do all my growing in the open using community pots and pricking out when the plants are very small, just beyond cotyledon stage. In the past, I have used various commercial seed raising mixes and while I have not had any major worries with them, I find a coarse sand-based mix best for drainage and pricking out. My favourite mix is three parts coarse washed sand to one part vermiculite. I fill the tray about three quarters full with this mix, lightly tamp down, place the seeds on top and cover with about half a cm. of the mix. To minimise rain splash problems, I cover the trays with a

thin layer of gravel and put them outside in an area which receives sun up to about 2 pm. To ensure the best possible drainage, all trays are raised off the ground in a wire basket (the sort that nurseries use for vegetable seedling trays). In warm weather, I water the trays once or twice a day but the vermiculite holds enough moisture and I cannot recall losses due to drying out of the trays.

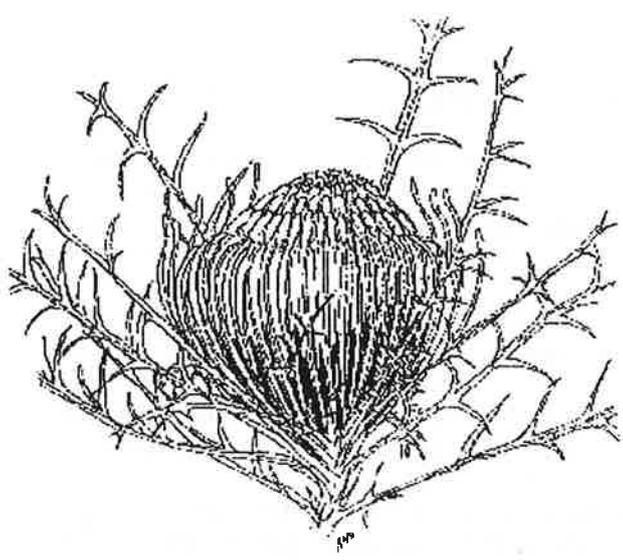
The loose mix makes pricking out a very simple task and root breakage is not a problem. After various trials, I have settled on the old "four inch cups" as my preferred pot. These are 4 inches high with a top diameter of 3 inches and slightly tapered. They don't require a lot of soil and will hold a dryandra plant for at least 12 months, long enough to get it in the garden. I found in the past that with larger pots (eg the standard 127 mm pot) and anything less than perfect drainage, soil could remain soggy for long periods in a wet winter and cause losses. However, over summer, the 4 inch pots do have a tendency to dry out and it is probably wise to add some water retaining granules to the soil at potting time.

After pricking the seedlings out, I put the pots back outside and water them along with the rest of my plants. Good drainage is absolutely critical and you need to ensure that your potting mix is satisfactory. I used to mix my own but in recent years, because of difficulty in obtaining suitable raw materials, I buy proprietary brands. The major problems with them are whether drainage is satisfactory and what fertilisers they already contain. Most large suppliers such as Debco and Nurseryman's Brand have a range of mixes and you can usually find one which claims to be suitable for native plants. Debco recently marketed in Victoria an Acid Loving Plant Mix which contains no fertilisers. I have used this for both of the above batches, adding my own mix of low phosphorus Osmocote, trace elements and iron and am quite happy with the results. Drainage is excellent and plants grow on with minimum problems. I have not sprayed either batch for diseases and correct any slight yellowing of plants with a solution of zinc and ammonium sulphates and iron chelates.

I would be very interested in comments from other growers about any aspects of my technique or about their experiences with growing dryandras from seed. I believe that the critical points for success are growing in the open, the quality of the mixes (drainage, fertilisers) and sowing at a time which is cool but not too cold and not likely to be followed by periods of very hot weather.

Tony Cavanagh

The *Dryandra* Page



Some Selected Species

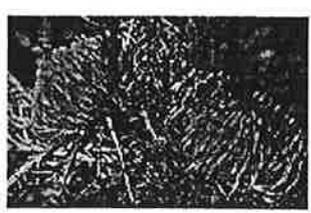
Each thumbnail image links to a higher resolution image and brief details of each plant can be seen by selecting the highlighted plant name

1. *Dryandra borealis*



Dryandra borealis is a newly named species with excellent cultivation potential [41k].

2. *Dryandra fraseri*



Dryandra fraseri is popular in cultivation in suitable areas [40k]. Photo; M.Pieroni

3. *Dryandra lindleyana*



Dryandra lindleyana is a variable species with a number of different forms [37k]. Photo; M.Pieroni

Dryandra borealis



Family:	Proteaceae
Distribution:	Western Australia on sand plains north and south of Geraldton.
Common Name:	No generally accepted common name.
Derivation of Name:	<i>Dryandra</i> ...after Jonas Dryander, a swedish botanist. <i>borealis</i> ..."of the north", referring to the fact that the species is the most northerly of the Dryandras.
Conservation Status:	Not considered to be at risk in the wild at the species level although one botanical variety is at risk.

General Description:

Dryandra borealis has been in cultivation among enthusiasts for some time but it has only recently been formally named. There are two recognised subspecies; subsp.*borealis* occurs in the Kalbarri area about 400 km north of Perth while subsp.*elatiior* occurs about 200 km further south in a restricted area near Three Springs. The former subspecies differs from subsp.*elatiior* in being a smaller plant overall and having leaves which have a distinct twist. *D.borealis* subsp.*elatiior* is regarded as being endangered

The typical form is a small shrub to about 1 metre in both height and width. The leaves are around 90 mm long by 30 mm wide but deeply lobed almost to the mid-rib. As indicated above, a distinctive feature is the spiral twisting (between 1 and 3 times) along the length of the leaves. *D.borealis* subsp. *elatiior* is a larger plant reaching 2.5 metres in height.

The flowers clusters of *D.borealis* are bright orange-yellow and around 30-35 mm in diameter. They are conspicuously displayed either at the ends of stems or in the leaf axils and are seen in late winter through to late spring.

D.borealis is not well known in cultivation but is a very desirable plant which has proven itself to be hardier than many other Dryandras in sub-tropical areas. It has been flowered successfully in Sydney in a well drained sunny position.

Propagation from seed is relatively easy and cuttings may be successful but slow to strike.



Dryandra fraseri



Family:	Proteaceae
Distribution:	Western Australia in heath or open forest.
Common Name:	No generally accepted common name.
Derivation of Name:	<i>Dryandra</i> ...after Jonas Dryander, a swedish botanist. <i>fraseri</i> ...after Charles Fraser, the first Superintendent of the Sydney Botanic Gardens.
Conservation Status:	Not considered to be at risk in the wild at the species level although one botanical variety is at risk.

General Description:

Dryandra fraseri has been cultivated by enthusiasts for many years and has proven itself to be one of the hardier species in the genus. There are three recognised varieties; var.*fraseri* is widespread over the entire range of the species from Kalbarri north of Geraldton to Cranbrook in the far south-west of the state; var.*ashbyi* has a coastal distribution in the northern part of the range; var.*oxycedra* has a very restricted occurrence south east of Geraldton and is regarded as endangered. The differences between the varieties are based on variations in foliage and habit:

- var *fraseri*...sprawling plant to 1 metre with green or blue-green leaves (up to 100mm long by 15-20mm wide) which are deeply lobed almost to the midrib
- var.*ashbyi*...low shrub with blue-green leaves which have more crowded leaf lobes
- var.*oxycedrus*...large shrub to 6 metres with very narrow and elongated leaf lobes

There is another unnamed variety which may be given a botanical classification in the future.

The flowers clusters of *D.fraseri* are normally bright yellow and around 30-35 mm in diameter. They are conspicuously displayed either at the ends of stems or in the leaf axils and are seen in autumn and winter. Some forms of this species have flowers with a distinctly pink colouration.

Although one of the better known of the dryandras, *D.fraseri* is not grown to any great extent except by Australian plant enthusiasts. It has proven itself to be very reliable in areas where wet, humid summers are not experienced. It tends to become a bit untidy with age but responds well to pruning if required.

Propagation from seed is relatively easy and cuttings are also successful.

Dryandra lindleyana



Family:	Proteaceae
Distribution:	South Western Australia in various habitats.
Common Name:	Couch Honeypot
Derivation of Name:	<i>Dryandra</i> ...after Jonas Dryander, a swedish botanist. <i>lindleyana</i> ...after John Lindley, an English botanist
Conservation Status:	Not considered to be at risk in the wild at the species level.

General Description:

Dryandra lindleyana forms part of the "*Dryandra nivea* complex" and was, until recently, considered to be synonymous with *D.nivea*. In the recent revision of the genus *Dryandra*, Alex George has restored *D.lindleyana* to species status and created six subspecies.

D.lindleyana is a prostrate to low growing shrub often spreading with underground stems. It is fire tolerant, regenerating from an underground lignotuber after fires. The leaves are long and narrow, up to 200 mm long and deeply lobed in triangular segments. The individual small flowers occur in inflorescences containing 35-45 flowers. The inflorescences occur at the ends of branches, are orange-brown in colour and about 50 mm in diameter. The flowers are arranged in a ring and curve towards the central axis leaving a circular hole in the middle. Flowering occurs from mid winter to mid spring.

Various forms of *D.lindleyana* have been grown for many years as *D.nivea*. The species is one of the more reliable species in cultivation, particularly in areas without humid, wet summers. All forms are attractive garden plants, particularly for rockeries. Because of the attractive foliage, the species attracts attention even when not in flower.

Propagation from seed is relatively easy and cuttings are also successful.

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