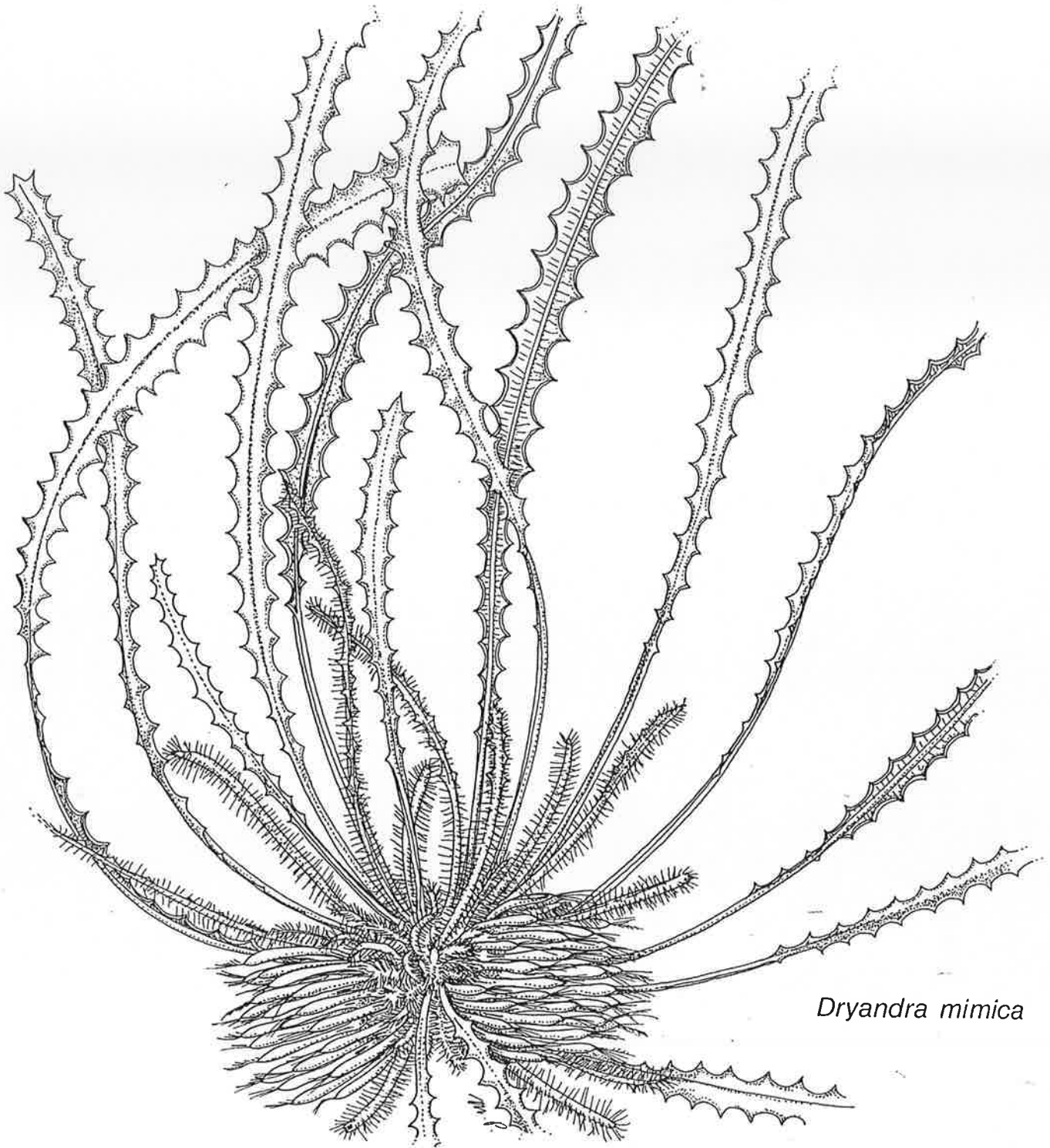


DRYANDRA STUDY GROUP

NEWSLETTER NO.22



Dryandra mimica

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SOCIETY FOR GROWING AUSTRALIAN PLANTS

DRYANDRA STUDT GROUPE

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Welcome to Newsletter No. 22. After the last mammoth effort, I'm afraid this one is a little shorter although I trust that the information it contains is still of interest. The Newsletter is our major expense and we are currently sending out over 60 of each issue which together with postage, costs around \$2.00 to \$2.30 per newsletter. I am grateful to all members who have contributed articles and notes to this and other issues. It makes my job as editor much easier and enables me to provide a range of what I hope is sufficiently varied information. A number of people have also sent me survey forms of the dryandras they are growing. In conjunction with the rare and endangered survey in this Newsletter, I hope to prepare an update for the next Newsletter.

Margaret has taken out membership for the group with the Network for Plant Conservation (so far the only Study Group to be involved). They have produced two newsletters and I will provide a summary of some of the main articles for the January Newsletter. To help document the position of dryandras, Margaret has prepared an excellent article on the rare and endangered species which she will also provide to the Network for their Newsletter. We are looking at expanding the information into a small booklet which will contain more detailed descriptions and illustrations of most species.

We are also interested in which of the rare and endangered species members are growing. Attached to this Newsletter is a survey sheet and I would ask everyone to look at what they are growing and provide us with information on rare and endangered species currently in cultivation. I will co-ordinate the information and pass it on to the Network Co-ordinator. One of the main ways such information can help is as a possible source of seed and genetic material for species which in future become very vulnerable.

Alf Salkin has provided us with an article on the post-conference Dryandra tour which by all accounts was highly successful. I have also featured notes from members in South Australia and Victoria on their successes (and failures) with dryandras and have also included several sets of germination results. These latter are important for the information they provide on germination times, problem species, etc. and I would welcome other results and notes on your successes and failures with all aspects of dryandra growing. I have some other sets of data which will be included in next Newsletter. Lastly, Hartley Tobin has provided us with some interesting climatic comparisons between W.A. and southern Victoria. Some of his observations on rainfall and lack of sunlight may help explain some of the problems we may experience from time to time.

I have not been able as yet to organise another Dryandra Get Together but am hoping to arrange a weekend in late August (22/23 or 29/30), possibly in the Grampians area. As soon as I can finalise things, I will circulate members.

Finally, please take a few minutes to complete the Rare and Endangered Dryandra Survey and return it to me. We will update it every 12 - 18 months. Also, as this is the end of the financial year, subscriptions for the next 12 months are due. Could you please forward your subs to Margaret. They will remain at \$5.00 for this year but need to be increased to \$6.00 for 1993-1994.

Happy dryandra growing

Tony Cavanagh

RARE AND ENDANGERED DRYANDRAS

by Margaret Pieroni

Dryandras gazetted as rare and endangered in the Department of Conservation and Land Management (CALM) publication, *Western Australia's Endangered Flora* (S.D. Hopper et al, The Department, Perth, 1990) are:-

D. serratuloides, *D. sp. nova* ASG 54 "Kamballup" and *D. sp. nova* ASG 12 Stirling Range National Park. All three are illustrated in the book.

Other taxa which are regarded as vulnerable are included on a Reserve List and include:-

VULNERABLE TAXA FROM THE CALM RESERVE LIST

TAXON	PRIORITY CODE
<i>D. aff. drummondii</i> ASG 38	1
<i>D. aff. erythrocephala</i> ASG 44 (yellow)	2
<i>D. aff. hewardiana</i> ASG 42	1
<i>D. sp. "D"</i> , ASG 16 (Hatters Hill)	3
<i>D. mimica</i>	1
<i>D. polycephala</i>	3
<i>D. sp. "B"</i> , ASG 7	1
<i>D. "Kulin"</i> , ASG 37	2
<i>D. aff. blechnifolia</i> ASG 22	2
<i>D. shanklandiorum</i>	2
<i>D. tortifolia</i>	3
<i>D. aff. hewardiana</i> , ASG 15, sp.	1
<i>D. conferta</i> ASG 32	2

Reserve List Code

Priority 1. Few poorly known populations on threatened lands.

Priority 2. Few poorly known populations on conserved lands.

Priority 3. Several poorly known populations, some on conserved lands.

A second list supplied by the Network for Plant Conservation and published in Report Number 15 of the Australian National Parks and Wildlife Service is as follows:-

TAXON	CODE
<i>D. mimica</i>	3E
<i>D. sp. ASG 12</i>	2EC
<i>D. aff. armata</i> , ASG20, sp. "H"	2E
<i>D. aff. fraseri</i> , ASG 25	2E
<i>D. aff. conferta</i> , ASG 31	2E
<i>D. "Kulin"</i> , ASG 37	2ECit
<i>D. aff. drummondii</i> , ASG 38	2E
<i>D. aff. calophylla</i> , ASG 41	2E
<i>D. aff. hewardiana</i> , ASG 42	2E
<i>D. aff. sclerophylla</i> , ASG 46	2E
<i>D. foliosissima</i>	3VC
<i>D. polycephala</i>	2VC
<i>D. serratuloides</i>	2V
<i>D. ASG 1</i>	2VC
<i>D. aff. ferruginea</i> , ASG 36	2V
<i>D. aff. falcata</i> , ASG 48	2VCi
<i>D. comosa</i>	2RC
<i>D. concinna</i>	2RCat
<i>D. foliolata</i>	2RCt
<i>D. horrida</i>	2RC

Distribution Code (Numbers)

Code 2.

Species with a very restricted distribution. Geographic range less than 100 km.

Code 3.

Range over 100 km but occurring only in small populations or restricted to highly specific habitats.

Conservation Status (Letters)

Code E.

Endangered species in serious risk of disappearing from the wild state if present land use and other causal factors continue to operate.

Code C.

Species known to be in a National Park or other proclaimed reserve.

Code V.

Vulnerable - not presently endangered but at risk in the long-term with changes in land use, etc.

Code a.

Adequately reserved i.e. at least 1000 plants.

Code i.

Inadequately reserved i.e. less than 1000 plants.

Code t.

The total population is within a reserve.

In view of the on-going surveys by CALM botanists and my own observations of plants in the wild, I have taken the liberty of modifying these lists somewhat. The Network for Plant Conservation data also includes two additional lists of "poorly known" taxa, none of which in my opinion are vulnerable at present. The "Kamballup" dryandra is not included on their list (probably because it was only recently discovered) but it is on the CALM one. There are two other species, however, which don't appear in either listing which I would consider threatened so I have compiled a list of endangered dryandras that I think we should be growing if we want to ensure their conservation through cultivation.

There are several of the un-named dryandras that have been given different "aliases" in the past so in order to reduce confusion, I have included Alex George numbers, Ted Griffin's species codes (B to J) and the collection numbers from the seed bank for those who have recorded them (S.G. nos.).

Brief notes on the individual species

Dryandra serratuloides - S.G. 278 (B); 66, 209 (M).

There are two distinct forms of this species. The northern (Badgingarra) form has longer leaves and the involucre bracts are longer than the flowers. The southern (Mogumber) form has very small bracts. Seeds and capsules are similar in both. I have found both forms very difficult to establish in the garden. A small plant of each was supplied to Kings Park for their Rare and Endangered Garden in 1990 and until recently both were doing well. The Mogumber plant died last year, however, and the Badgingarra plant has just died (January 1992). I believe that a recent survey by CALM botanists has increased the number of plants in both wild populations quite substantially so its status might be changed in the future.

Dryandra sp. nova No. 54 "Kamballup" - ASG 54.

This is the recently discovered species described briefly in Newsletter 14. So far it is proving relatively easy to grow in the garden. Some members may have obtained seed from Nindethana Seed Service as its discoverer, Peter Luscombe, is the proprietor of that company. I have a plant doing well in my garden and one given to Kings Park in 1990 is also thriving.

Dryandra sp. nova No. 12 - ASG 12; Sp. F; S.G. 421.

This species, although in a National Park, is in my opinion, extremely vulnerable. Plants which only grow on one or two locations on Bluff Knoll in the Stirling Ranges were affected by die-back (*Phytophthora cinnamomi*) and, since the "controlled" burn of last April I have not heard of their fate. Keith Alcock advised stratification of the seed but I have found that the seed germinates readily albeit slowly (13 weeks) when sown in the usual way in April. I have not succeeded in growing a plant in my garden - two have died during their first summers but a plant I gave to Kings Park in 1990 is doing very well so far in the Rare and Endangered garden in the shade of, of all things, a large camphor laurel tree and well mulched with casuarina needles.

Three other species which I consider to be vulnerable are also restricted to the Stirlings. Only one, Sp. nova ASG 48, is on the ANPWS list. I have brought the other two to the attention of the relevant CALM authorities as being worthy of close monitoring for various reasons. The two unlisted species are ASG 47 and ASG 49 and brief details of these three Stirling Range species are given below.

Dryandra sp. aff. plumosa No. 47 - ASG 47; S.G. 159.

This is a tall, column-like plant with leaves like *D. plumosa* but with larger, showier flowers which was described by Keith in Newsletter No. 12. As far as I know, it occurs in only one location - a gravel pit. Many plants have already been destroyed although it is regrowing where the gravel is no longer being removed. It remains to be seen whether the area will be completely restored and whether the dreaded die-back fungus will be introduced before the gravel pit is finally closed.

Dryandra sp. aff. falcata No. 48 - ASG 48; S.G. 247, 471.

This unusual dryandra has a tall, lean habit with leaves and flowers like *D. falcata*. It is known among Study Group members as the "cactus" dryandra

because of the habit of the plant, with its branches, thickened at the base, protruding at right angles to the main trunk then very shortly afterwards turning to grow parallel to the trunk, reminiscent of a saguaro cactus. We only know of very few plants growing on the edge of a disused gravel pit where die-back has killed many other plant species. It is one of the worst affected areas I have seen. However, the species is growing well at Cranbourne and has flowered since 1986. It has large, woody seed capsules.

Dryandra sp. aff. ferruginea No. 49 - ASG No. 49; S.G. 472.

Known only from one location in the Stirlings, this plant although locally common, is growing where a popular walking track crosses its habitat. It is a small shrub with very attractive ferruginea-like flowers. My plant, which is doing well and flowered profusely last spring was obtained from a nursery as "D. runcinata" (an old name for *D. ferruginea*). The seed probably came from Nindethana and some members may already have this plant if they've obtained seed from this source.

Dryandra mimica S.G. 202,495. (See cover).

There are only three known locations of this species in the wild and two of these are not in reserves. I have a plant in my garden which flowered for the first time last Christmas (1991). It is growing well and seems to be quite hardy. A well-established plant at the W.A. Herbarium is also looking very healthy and has flowered but not yet set seed.

Dryandra sp. aff. armata Sp. H. - ASG 11 and ASG 20; S.G. 137 and 366 (11), S.G. 257 and 368 (20).

Two distinct forms of this species occur which will probably be split into two taxa. One of the most northerly dryandras, one form, No. 11, occurs near Kalbarri while the other, a taller, denser shrub to two metres, is found near Three Springs. Its most striking feature is the involucre of long bracts which are green-yellow contrasting with the bright yellow perianth and golden limb of the flower. The photograph in Ken Newby's *West Australian Wildflowers for Horticulture* Vol. 1 as *D. cirsioides* is probably this species as is the much-enlarged photo in Michael Morcombe's *Australia's Western Wildflowers* (page 28), showing the flower in bud.

Dryandra sp. aff. fraseri No. 23 - ASG 23; S.G. 499.

Apart from *D. arborea* and possibly *D. sessilis*, this could be the tallest growing dryandra. It is closely allied to *D. fraseri* and grows in a limited area near Three Springs, sometimes in association with *D. fraseri*. All parts of the plant are similar to *D. fraseri* but the growth habit is of a few columnar branches from the ground to more than three metres.

Dryandra sp. aff. conferta No. 31 - ASG 31; S.G. 547.

This is probably a form of *D. conferta* but it is a very attractive one in cultivation. I have seen it growing in South Australian and Victorian gardens. Only one population is known in the wild, near Corrigin. The plants are quite small, about one metre high, the leaves are blue-grey and the flowers are lemon-yellow.

Dryandra sp. nova "Kulin dryandra" - ASG 37; S.G. 480.

This is a prostrate species with large flowers at ground level. The flowers are surrounded by large, pointed, hairy bracts which do not appear to open out fully. They have a most offensive odour and are almost certainly pollinated by flies. The entire population of less than 100 plants grows entirely in a reserve near Kulin.

Dryandra sp. aff. calophylla/pteridifolia No. 41 - ASG 41; S.G. 465, 533.

A small, prostrate plant, this species has dusky pink flowers which surround the upright-leaved plant growing off underground stems. It grows near Woodanilling, most of the plants being in a disused gravel pit and adjacent flora reserve with other dryandras growing in pure laterite gravel. I have a plant which is growing slowly. An attractive feature of this species is the velvety purple-red new leaf growth which precedes the emergence of the flower heads from under the ground.

Dryandra sp. aff. *hewardiana* No. 42 - ASG 42; S.G. 270.

Another species from the Three Springs area, this is very closely allied to *D. hewardiana* but is distinguished by its much larger leaves. A plant I supplied to Kings Park is doing well and growing very quickly in a bed mulched with gravel.

Dryandra sp. aff. *sclerophylla* No. 46 - ASG 46; S.G. 56, 503.

We know of only a few plants of this taxon in the Badgingarra area. It is probably a form of *D. sclerophylla*. However, I have only recently become aware, when comparing my drawings, that the size of the seed capsules and the length of the leaves fall mid-way between *D. sclerophylla* and *D. kippistiana*. No. 46 flowers later than *D. sclerophylla* but coincides with *D. kippistiana* with which it grows. I wonder whether it is a hybrid, albeit a stable one?

Dryandra sp. aff. *hewardiana* No. 1 - ASG 1; S.G. 96, 332, 524, 528, 538.

From west of Woodanilling and near Katanning, this is the species I referred to in my article on the trip to Albany in January. A bushy, spreading shrub to two metres with flowers similar to *D. squarrosa*, this has leaves similar in shape to *D. hewardiana* but much smaller and sticky when young. The species has been growing well for several years at Cranbourne, among the first plantings.

I have supplied seed of most of the above dryandras to Study Group members some of whom have grown several of them successfully. As several species are so vulnerable in the wild, it may be necessary in future to grow them "ex situ" for re-introduction to their natural habitats. The Australian Network for Plant Conservation has recently been formed with this possibility in mind. Many of our indigenous plants can be raised much more successfully far from their natural habitats as I was made aware of during my visit to private gardens in South Australia and Victoria in 1990.

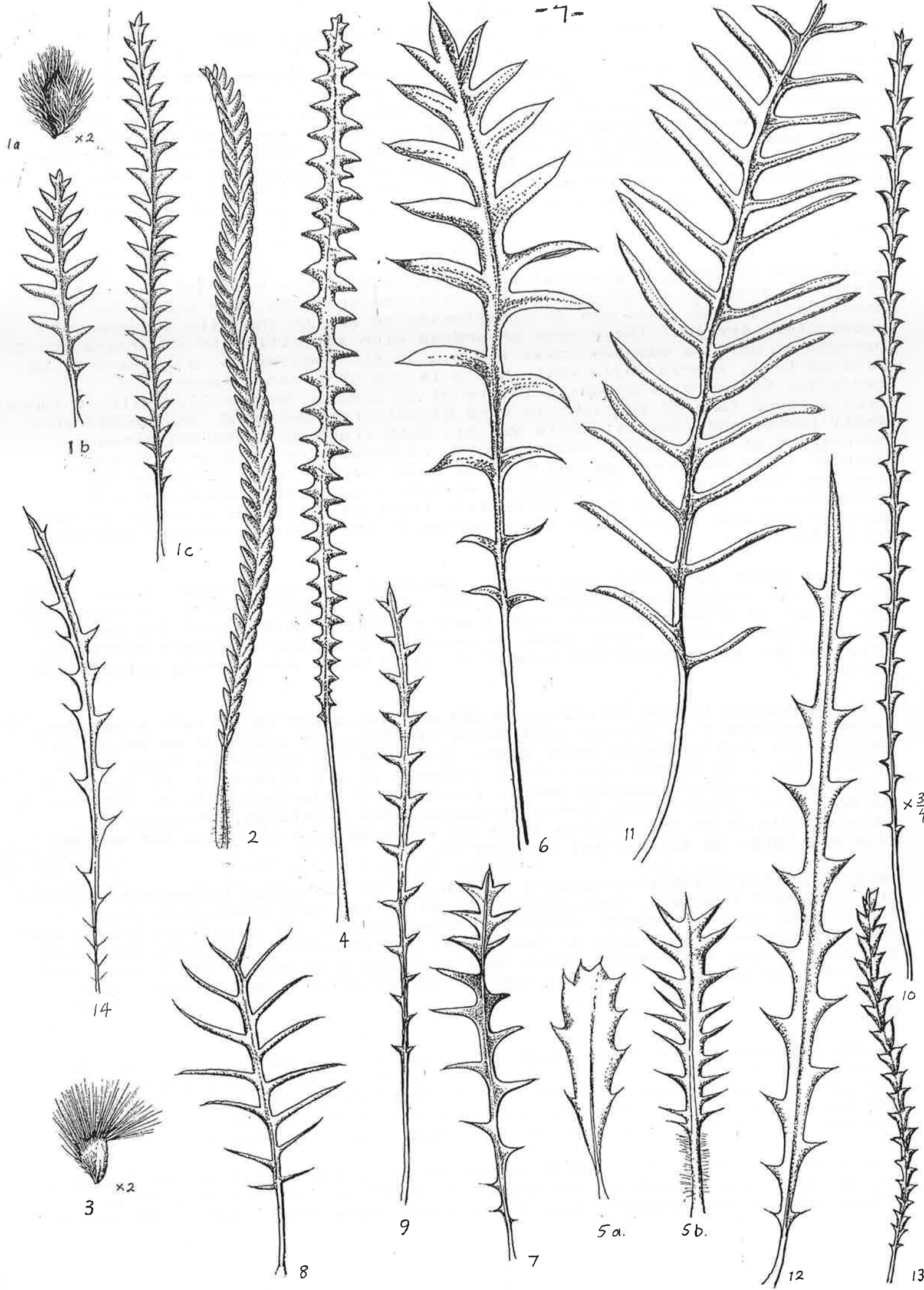
I think it would be a very well worth while exercise if we could survey the results so far of members experiences growing these particular dryandras.

We are very short of, or completely out of, seed of some of the rare plants so if anyone has some to spare, it would be very much appreciated for the seed bank. If you'd like to grow some, just send a good strong envelope and postage for the ones we do have in stock.

Meanwhile, we would be very grateful for your results in growing any of the endangered dryandras. A survey form is attached to this Newsletter. Please complete it and forward it to Tony Cavanagh. Even if you are growing only one or two of these species, send in the results. You may be the only one who has succeeded!

Leaf Drawings of Rare and Endangered Dryandras

1 = *D. serratuloides*, (a) capsule, (b) Mogumber form, (c) Badgingarra form; 2 = *D. No. 12*; 3 = "Kamballup" dryandra capsule; 4 = *D. No. 47*; 5 = *D. No. 48*, (a) juvenile leaf, (b) adult leaf; 6 = *D. No. 49*; 7 = *D. sp. H, No. 20*; 8 = *D. No. 23*; 9 = *D. No. 31*; 10 = *D. No. 37*; 11 = *D. No. 41*; 12 = *D. No. 42*; 13 = *D. No. 46*; 14 = *D. No. 1*.



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1991 POST W.A. CONFERENCE DRYANDRA TOUR

The 1991 ASGAP Conference in Perth had a number of conference tours the smallest and most specialised of which was the post-conference tour led by Margaret Pieroni to some of the S.W. dryandra sites. Margaret with her usual flair for organisation had prepared maps so that it would be possible to locate some of the many sites where dryandras grow south of Perth. For one member of the Dryandra Study Group who had as his passenger the leader of the Daisy Study Group, the map on one day of the tour proved to be essential after we became separated from the main party in the Stirling Ranges.

DAY 1

Apart from the meeting place at Crossmans Picnic Area some 100 km south of Perth where we saw *D. squarrosa*, the first major sites were along the Woodanilling Road. This was an opportunity to see in the wild a number of undescribed species. There were dryandras with affinities to *D. armata* and *D. nervosa* as well as species novae 1,3,5,8,38,41. Species No. 3 appears to be related to *D. pteridifolia* while No. 5 is one of several forms of *D. conferta*. Number 8 is an upright form of *D. armata*. Number 38, while it looks like a mound form of *D. nivea*, is more closely related to *D. drummondii* with small leaves and flowers, while No. 41, with creeping stems and flowers coming out of the ground, looks like *D. calophylla* or *D. pteridifolia*. Whether these numbered species will be described by Alex George as new species, subspecies or varieties is anybody's guess but looking at his treatment of the banksias, I personally think we shall see a number of new species but also quite a lot of varieties in the 50 or so unnamed species currently known.

The next major stop which was stop 6, was near Gowangerup water tower. These forays into lesser-known byways were not without their hazards, in this case the danger of broken bottles. Stop 6 was a curious site - part tip and with an area fenced off by water pipe, presumably to indicate a plant sanctuary. Dryandra No. 53, a prostrate form of *D. tenuifolia*, was growing outside the fence.

From Gowangerup to the Stirlings is but a short drive so by late afternoon, we were at stop 7 in the car park below Mt. Trio. It was here we met of all people, the indefatigable Peter Olde, leader of the Grevillea Study Group. Surprisingly, he showed very little interest in the dryandras! At this site, a number of dryandra species occur, including *D. blechnifolia*, *D. brownii*, *D. formosa*, the latter being common throughout the Stirlings. *Dryandra seneciifolia* is on the walking track to the summit of Mt. Trio but as the time was late, we did not try to find it.

We camped that night at a camping ground run by two local farmer-naturalists, the Sorrenson brothers. Most people stayed in the very comfortable pise (compressed earth) chalets. Margaret showed some of her excellent slides and the park ranger also showed slides of various aspects of the park including the devastating "cool burn" which destroyed the area around Bluff Knoll and probably the very rare dryandra species No. 12 which grows on the summit.

DAY 2

It was possible from the map to do this tour without racing off after the leader - or so the theory went! At stop 1 on Stirling Range Drive near the Taleyuberup Picnic area we could find *D. concinna*, *D. foliolata*, *D. brownii* and Species No. 48, the "cactus" dryandra but it was better if one was with Margaret as she could explain the finer points of the taxonomy.

Stop 2 was at Lookout Hill where we walked up to the summit to see Dryandra No. 10 (affinity *D. armata*) and Number 49 which has affinities with *D. ferruginea*. It was between stops 2 and 3 that Esma and I "lost" the rest of

the party. We assumed that it would be possible to catch up so that when Esma saw some particularly enticing daisies - and what may they be I hear some of you ask - we stopped.

Eventually we drove on to Baby Barret Hill where we were to have morning tea. On not seeing the rest of the cars in the car park, we drove on. Little did we know that there was another car park above the one we saw with all the cars out of sight from the road! Thus it was that we did not catch up with the rest of the party until we returned to the caravan park. The stops where interesting dryandras occurred were fairly clear from the map but without Margaret to point out the significance of what we were looking at, it was not as educational. The time, however, was not wasted. I found a number of petrophiles and isopogons (well, at least they are members of the Proteaceae). Esma was able to find some uncommon daisies as well as spectacular displays of *Helipterum roseum* which we suspect were from commercial seed and specially planted for the tourists.

The Stirling Ranges surprisingly did not have many undescribed species. Stop 5 at Red Gum Pass was a site for Dryandra No. 47 which has affinities with *D. plumosa* and at stop 8, near the start of the Woogenilup Road in Chester Pass, we saw the quite rare species "Kamballup".

The final day of the tour took a much reduced party north from the Stirling Range back through Gowangerup to Katanning. We turned off the Katanning-Dumbleyung road on to Paterson Road and were soon deep in dryandra country but this was confined to a narrow belt at the road margins. "Roadside Reserves" is the euphemism by which these linear remnants are described. At the conference, one of the papers described attempts to save these remnants but having seen some of the ignorance displayed by local councils and grader drivers, and having witnessed other attempts to "tidy up" the roadside, I am somewhat skeptical. Perhaps the most serious threat is from introduced plants such as a very attractive cerise gladiolus which is rampant on many roads north of Perth.

At Paterson Rd. growing with *Eucalyptus macrocarpa* we saw *D. conferta*, *D. cynaroides*, *D. ferruginea* and what Margaret regards as a hybrid. Having seen a number of Banksia hybrids in the wild, it would not surprise me that hybridisation also occurs with dryandras.

Morning tea outside of Dumbleyung brought a bit of a surprise. We stopped outside a farm which had a remarkable display of *Helipterum roseum* near the gate. Whilst we were having our cuppas, the lady from the farm drove up. She turned out to be an SGAP member. Yes, she told us, the helipterums had been planted and she invited us to see her very extensive garden which included many Proteaceae, including the uncommon South African *Sonocephalus*.

The final stop for the Salkins was at the Dryandra Forest near Narogin. For the people going back to Perth, there were still three other stops and at the stop near Wandering, Dryandra No. 28 (a mound-forming type of *D. nivea*) was seen as well as Dryandra No. 4, affinity *D. seneciifolia*.

I am quite sure that everybody on the trip got a great deal from it. For Esma and myself, it was the highlight of our trip to WA. Margaret is to be congratulated for the thorough preparation that she put into the organization. The maps that made the trip possible will be filed away as important historical documents.

Alf Salkin

Additional comments from Margaret

We all thoroughly enjoyed the trip and the company. We saw as many dryandras as I know of, between Perth and Kamballup, including all the Stirlings endemics. Alf and Esma missed out on Kamballup which the others thought was the most interesting spot - the dryandra was in full bloom surrounded by yellow *Verticordia endlicheriana*.

I was able to show them other special wildflowers that I'd seen for the first time myself the previous weekend. Among these were *Anigozanthos onycis* and various orchid species flowering in the area of the "controlled burn" of last April which burned out much of the eastern end of the range including Bluff Knoll. The re-sprouting leaves of *Dryandra blechnifolia* were most attractive, like pink furry fern fronds.

On the last day of the trip (as recounted by Alf) we met an SGAP member who turned out to be Roxaine O'Toole, a former member of the Dryandra Study Group. She is growing all kinds of flowers for the local market and among her many specimens were a beautiful shrub of *D. praemorsa* with small leaves and flowers but very floriferous and a magnificent *D. formosa* as well as several banksias. This unexpected diversion meant that we were late in reaching Dryandra Forest for lunch. However, we did see *D. subpinnatifida* in full flower before saying goodbye to the Victorians who were heading home.

Highlights of the trip as far as Dryandras go included *D. stuposa* (odd plants flowering), *D. sp. "Kamballup"*, *D. falcata*, *D. subpinnatifida* and No. 45.

Margaret Pieroni

DRYANDRAS IN SOUTH AUSTRALIA

What with illness and a backlog of work over the last six months, our dryandras have not had very high priority yet most of them survived and quite a number are progressing and flowering well. We were thrilled to find three nice flower buds on *Dryandra proteoides* (which was bought as a different species). It is now about 80 cm high and 30 cm wide. *Dryandra quercifolia* is in full flower with *D. cuneata* not far behind (late May). Many flowers on *D. tenuifolia* have opened and one form of *D. nervosa* (in a pot) is flowering for the second year in a row. *Dryandra speciosa* (red form, cutting grown) has a good number of buds and should be a delight in flower as it is in the front of our rockery and raised up about 0.5 m. *Dryandra polycephala* is in light bud and should put on a good show in a few months time.

SGAP (South Australia)'s autumn plant sale sold about 30,000 plants and a few of our growers supplied roughly 400-500 dryandras which covered about 80% of the named species. I understand that most of the seed was supplied by commercial sources such as Nindethana. I was surprised to see the rare *D. pulchella* there and thought it should have a good home so we bought one.

Apart from the interest displayed by some of our SGAP members who are growing a number of dryandras, the public responded very well, many of them being attracted by the coloured photo and description provided for each species.

Recently, two young gardeners who are employed at the Wittunga Botanic Gardens at Blackwood visited our garden and one of them was very attracted to the plant we now call *Dryandra brownii* (formerly called "*Dryandra arctotidis*" - Ed.). This one has not flowered so I could not grow them one from seed. They were interested enough to make a check at the Library of the Botanic Gardens but unfortunately for me, they could find no mention of this species. Some weeks later, however, my credibility was restored when they checked on the Dryandra Study Group Newsletters at our SGAP meeting where the notes are made available to those who are interested and found *D. brownii* discussed in Number 17, Page 9 as one of the "nivea" group.

SGAP South Australia recently held its biennial regional conference at Loxton in the Riverland. During the Saturday night dinner, we were entertained by a local member who is an international rose growing celebrity - David Ruston. He made five large floral arrangements using mostly Australian native flora and foliage which blended beautifully together. Because of the time of the year, there was a good assortment of banksias and *Dryandra quercifolia* (which he highly praised as a cut flower with long stems). The dryandra both in bud and flower compensated for the stiffness and colour of the banksias and was the highlight of the arrangement.

Lloyd and Lorraine Carman

DRYANDRAS AT STAWELL, VICTORIA

It is thrilling to hear about all the new Dryandras that are being discovered as we learn more about the genus - the same is happening with Grevillea. No doubt, when the revision is finally finished, more species will come to light!

The summer of 1990-1991 was a disaster for us in inland Victoria - only 15 inches of rain for the year (3 of which fell in January). As a result, my dams ran dry and many plants in the garden died. In particular, south coast WA banksias were decimated with most *B. baueri*, *B. baxteri*, *B. speciosa* and *B. coccinea* etc. dying. However, very few dryandras were lost, proving their greater drought tolerance as compared with their cousins. Species which did succumb were *D. mucronulata*, several forms of *D. ferruginea*, most *D. formosa* and a couple of *D. armata* which half died and have never recovered, although they are still not dead!

Most of my dryandras have now flowered spectacularly and I now look forward to the revision so that I can identify them all. Most originally had Keith's collection numbers on the labels but sadly, most have now faded or been lost.

Neil Marriott

RECENT GERMINATION RESULTS

Several members have sent me or Margaret results of their germination experiments. One or two commented that they wished they could achieve Keith's results! Germination data and results of sowings at different times of the year are all important to our understanding of the genus and I would urge all members to keep records of their germination results and let me have a brief report, especially if you are attempting some of the rare or endangered species discussed by Margaret elsewhere in this issue.

From Ron Pearson, Mentone, Victoria

I read Keith's article on seed raising in the last Newsletter with interest and his results make my efforts look quite inadequate! He obtained an emergence rate of around 73% with a further 6% loss when the seedlings were tubed up. My figures for emergence were 51% in 1990 and 43% in 1991. Again this year I followed the same procedure as last year - ie to sow the seeds in an open mix of 3 parts coarse sand, 1 part peat moss and 1 part small pine bark (up to 8 mm.). No attempt was made to sterilise the mixture prior to planting.

Next year I will use a mix of 4 parts coarse sand and 1 part peat moss. In an attempt to provide some initial sterilisation, I will treat my seed raising mix with a drench of 4% Formalin. (If this doesn't work, there seems to be no alternative left but for me to again take over the kitchen oven and try to heat sterilise a bucket of mix). I will follow this with a Fongarid drench at

the time of planting the seeds, followed by later drenches of Mancozeb and Zineb.

The remainder of my procedure was similar to last years - the seeds were planted on 4/3/91 and potted into forestry tubes at the end of winter on 23/9/91, somewhat later than I had anticipated but holidays intervened. My results are listed below.

SPECIES	NO. SOWN	NO. GERM.	GERM. TIME (days)	PLANTS ALIVE 15/12/91
SN armata Forrestfield	4	1	24	1
SN No. 49	5	1	34	nil
SN "IT", No. 50 (CN476)	6	0	-	-
SN No. 36 (CN494)	7	0	-	-
SN "carlinoides"	7	2	26-28	1
SN No. 12 (sp. F) (CN421)	12	5	80-96	5
SN No. 7 (CN357)	9	7	24-37	1
D. tridentata (CN225)	8	1	25	1
SN sp. H (CN366)	6	3	21-27	2
SN sp. J (CN539)	9	0	-	-
D. serratuloides (CN512)	6	0	-	-
SN No. 41 (CN465)	8	8	27-42	1
SN No. 38 (CN542)	7	5	36-80	nil
SN aff. fraseri (CN499)	8	4	20-26	4
SN aff. armata (No. 8)	7	5	26-60	4
SN "Kulin" (No. 37) (CN480)	2	1	26	1
SN aff. pteridifolia (No. 3) (CN341)	9	3	37-60	3
SN No.54	6	0	-	-
Seed from Cranbourne				
D. nobilis	7	6	26-44	5
D. quercifolia	10	8	27-52	4
D. foliosissima	12	6	26-72	6

SN = Species nova; CN = Seed Bank Collection Number

From Elizabeth Brett, Corowa, NSW.

I had two late winter sowings in 1991 and this may account for the spread in germination times, particularly of the seed collected from Cranbourne which was planted in early July. The seeds were extracted using nail clippers to cut around the capsule. They were planted in coarse river gravel with the pots standing in water in a shallow tray. The seedlings were potted on into a mixture similar to that recommended in Volume 1 of the Encyclopedia of Australian Plants for plants sensitive to phosphorus (P 103). By late October, most had their true leaves. The approximate germination times were as follows:-

Batch 1 - Sown 10/8/91

SPECIES	TIME (days)	SPECIES	TIME (days)
SN No. 22 (CN219)	-	SN No. 16 (Sp. D) (CN493)	51-68
SN No. 53 (CN233)	47-57	SN No. 26 (CN501)	43-55
D. arctotidis (CN425)	43-58	(Badgingarra)	
D. aff. ferruginea (CN437)	50-69	SN No. 45 (CN539)	40-56
SN No. 3 (CN341)	55-68	(aff. serratuloides)	
SN No. 34 (CN444)	51-68		
(aff. ferruginea, Newdegate)		Batch 2 - Cranbourne (sown 30/6/91)	
D. brownii (CN488)	47-57	D. sp.	46-68
		D. quercifolia	46-68

From David Randall, Cobram, Victoria

I described my method of propagation in the last Newsletter. I still find the egg box method satisfactory but as my results below appear to indicate, September is not quite as good as an earlier sowing such as in June. I put this down to too much humidity in the egg cartons and I find with the warmer weather over summer, I am also having a lot of trouble keeping small plants going. Sparrows are also now more of a problem than in June. The results in the table below are for two major sowings, in June and September, 1991. The seedlings from June are healthy and growing well but most of the September ones are still quite small (June 1992). Over summer, I lost the following seedlings as well as a number of plants in the garden: 1 x *D. sp.* No. 5; 1 x *D. sp.* NO. 19 (aff. *ferruginea*); 1 x *D. sp.* No. 49 (aff. *ferruginea*); 1 x *D. nana*; 3 x *D. subulata*. Most of them (including the ones that died in the garden) became very yellow so I treated them with 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 but I'm not sure whether I should apply it to the foliage or roots and at what rate.

Results for my two major sowings in 1991 were:-

SEED SOWN JUNE	NO. SOWN	NO. GERM.	SEED SOWN SEPT.	NO. SOWN	No. GERM.
SN 3 (aff. <i>nervosa</i>) (CN341)	6	6	SN 5 (CN335)	3	2
SN 7 Sp. B (CN370)	5	5	SN 19 (aff. <i>ferruginea</i>) (CN 100)	3	3
SN 16 Sp. D (CN493)	5	5	SN 37 "Kulin" (CN480)	2	2
SN 20 (aff. <i>armata</i>) Sp. H (CN386)	7	7	SN 49 (aff. <i>ferruginea</i>) (Stirling Ra.)	3	3
SN 23 (aff. <i>fraseri</i>) (CN499)	6	6	<i>D. arborea</i>	3	3
SN 24 (aff. <i>nobilis</i>) (CN506)	8	8	<i>D. nana</i> (CN227)	3	3
SN 26 (aff. <i>nivea</i>) (CN502)	5	5	<i>D. stenoprion</i> (CN513)	1	1
SN 30 (aff. <i>squarrosa</i>) (CN530)	9	9	<i>D. subulata</i> (CN509)	3	3
SN 34 (aff. <i>ferruginea</i>) (CN444)	6	6	<i>D. tenuifolia</i> (L. Carman form)	3	3
SN 36 (aff. <i>ferruginea</i>) (CN494)	6	6	<i>D. preissei</i>	3	3
SN 38 (aff. <i>drummondii</i>) (CN342)	7	4	SN 43 (aff. <i>cirsioides</i>) (CN115)	5	0
SN 41 (CN465)	5	5	<i>D. sp.</i> "Kamballup"	3	0
SN 45 (aff. <i>serratuloides</i>) (CN539)	5	5			
<i>D. conferta</i> (CN547)	7	7			
<i>D. shanklandiorum</i>	6	6			

DRYANDRAS AND CLIMATE

It is interesting to see the different Dryandras that people have succeeded with and the conditions under which they have them growing. It made me think that if, we members, could exploit our successes by growing more and more of the species with which we are succeeding, then across the whole study group we could have a most extensive selection of plants for more detailed study purposes and propagation material.

My D. praemorsa (pink) and two well established D. formosa have given up. The water table rose to within about 300 mm. of the soil surface and has remained close to that for more than a couple of months so I think that might have something to do with their deaths. In summer, that same soil can be 'powder dry' to a depth of half a meter or more, so those root systems certainly battled with extremes. I have collected seed from all those plants so now I hope to germinate that seed over the next few months.

On the positive side, D. 'kamballup' is looking extremely healthy and putting on new growth. At the rate it's going, I could be lucky enough to have it produce flowers next year.

The following are some of my thoughts about the problems I face in growing Dryandra in relation to our appalling climatic conditions. It might be suitable for inclusion in the next Study Group Report.

It is a comparison of our weather with that of the southern part of W.A. The W.A. information is from a 1968 publication.

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"What Do Dryandras Put Up With In This Part Of Victoria?"
or

"Why This Year Has Been Disastrous For Some Of My Dryandras!"

Rainfall Statistics:- Jan. - Aug. 1991 (The Gurdies)
[Yearly Average]

Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	
112	2	52	34	45	139	151	132	Monthly
[38]	[31]	[61]	[81]	[84]	[93]	[99]	[81]	Rainfall
11	3	13	12	14	23	23	24	No. Wet Days
[8]	[8]	[10]	[13]	[16]	[17]	[18]	[18]	/Month
112	124	176	211	256	396	547	679	Progressive
[38]	[69]	[130]	[211]	[296]	[389]	[488]	[569]	Rainfall
11	14	27	39	53	76	99	123	Progressive
[8]	[16]	[26]	[39]	[55]	[72]	[90]	[108]	No. Wet Days

I do not have a system for measuring hours or days of sunlight, which I believe could be a significant factor with the growing of Dryandra, but, by default, I make two assumptions:-

1. That more rainfall means less sunlight,
and
2. That more rainfall days means less sunlight.

Comparing 'NORMAL' Annual Rainfalls:

The Gurdies annual rainfall is about 874 mm.. This is comparable with Perth area where a few Dryandra grow.

Most Dryandra grow in the 300 mm. to 700 mm. annual rainfall area.

Even though Perth and The Gurdies have similar annual rainfall, Perth's annual rainfall is on 122 days in the year compared with 145 at The Gurdies.

Most Dryandra grow in areas where the annual number of rainfall days ranges from 42 to 98.

My simple overall conclusions are that, at The Gurdies, my Dryandra (depending on species) will:-

- 1. Have to cope with normal to almost three times the annual rainfall experienced in their natural habitat.
- 2. Receive only 90 - 66% of the sunlight experienced in their natural habitat.

Already, this year The Gurdies rainfall and number of rain days has exceeded what most Dryandra are used to. All I can hope is that the Dryandra that I grow have a wide range of tolerance, especially with regard to increased rainfall and decreased sunlight.

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Hartley Tobin

SUBSCRIPTIONS FOR 1992 - 1993

The group's year runs from July 1, 1992 to June 30, 1993. subscriptions are \$5.00 for Australian members and \$8.00 for overseas. Please make cheques payable to the Dryandra Study Group and forward to Margaret. Thanks to all those who have already paid.

Name: _____

Address : _____

COMMENTS OR SUGGESTIONS FOR INFORMATION :

RARE AND ENDANGERED DRYANDRAS SURVEY

Return to:
 Tony Cavanagh
 16 Woodlands Drive
 OCEAN GROVE 3226

NAME..... ADDRESS.....
 (not for publication)

GENERAL LOCATION OF GARDEN (eg Perth metropolitan area, Bellarine Peninsula Vic

SOIL TYPE.....

CLIMATE, RAINFALL.....

ANY SPECIAL MODIFICATIONS MADE FOR DRYANDRAS (eg built-up beds, watering etc)

ANY OTHER RELEVANT NATURAL CONDITIONS (eg frost, salt, wind etc)

DRYANDRA	SEED GERM. (good, poor)	NO. OF PLANTS (pots, garden)	CONDITION OF PLANTS (vigorous, slow, poor)	CULTIVATION flowered, set seed (yes/no) (yes/no)
serratuloides (B)				
serratuloides (M)				
No. 54 "Kamballup"				
No. 12 sp. F				
No. 47 aff. plumosa				
No. 48 aff falcata				
No. 49 aff. ferruginea				
mimica				
No. 20 aff. armata				
No. 23 aff. fraseri				
No. 31 aff. conferta				
No. 37 "Kulin"				
No. 41				
No. 42 aff. hewardiana				
No. 46 aff. sclerophylla				
No. 1				