

DRYANDRA STUDY GROUP
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STOP PRESS

Bloomings Books has organised a "super book launch" in conjunction with APS Maroondah for Friday night, November 17 with the function commencing at 8.00 pm. This is the traditional "end of year" wind-up for Maroondah and it seemed like an appropriate occasion to celebrate the involvement of Bloomings Books with a number of books with Australian plants or Australiana themes. Two books of particular interest to us are of course *The Dryandras* and the 3rd edition of *Grow what where* which also includes an interactive CD Rom covering all the material in the book, both of which will definitely be launched that night. Several others, including a book on Eucalypts and one on the Grampians may be if the authors are able to attend.

Margaret is flying over for the launch and we thought it would be a great opportunity for some sort of get-together of Dryandra Study group members, probably on Sunday 19th November. Planning is still in its infancy but there are two possibilities:

1 A visit to the new Cranbourne Botanic Gardens Australiana gardens with the possibility of a visit to the Dryandra collection. I have not been able to confirm if this last is possible as we need permission and the area is still under quarantine due to *Phytophthora* infestation. Also as it is a Sunday, there may be no staff on duty who can organise for us to visit the Dryandras. The new gardens, however are wonderful and many plants should still be in flower. Entrance to the designed section of the gardens is around \$12.00 per person and if we decide to go to Cranbourne, we can take picnic lunches; food can also be purchased from the Café.

2 We could gather at my place in Ocean Grove and visit a number of gardens and native plant nurseries, all of which have extensive gardens. They don't have a lot of dryandras but do have many other interesting Australian plants. Either way, it is likely to be a busy day and if you think you would like to have a get-together, could you phone me over the next couple of weeks. I am unsure about how many of you might be able to travel to Ocean Grove which is about 100 km south west of Melbourne mostly on freeways but it would be great if we arrange it.

Hope to see you in November,
Tony

Dryandra quercifolia flowers are usually yellow but naturally occurring pink forms of this very attractive species make excellent cut flowers and are often grown for this purpose. Flower heads are terminal on straight stems. The leaves are prickly, however. Shrubs are quite bushy and can attain a height of 3m. or more if unburnt for long enough, in the wild. They are killed by fire. It grows in the Fitzgerald River National Park and the Ravensthorpe Range where it hybridises with other dryandra species. It flowers in autumn.

DRYANDRA STUDY GROUP

LEADER

Mrs. Margaret Pieroni
22 Ravenhill Heights
DENMARK
WA 6333
Email: mpieroni@bigpond.com
Phone: (08) 9848 3331

NEWSLETTER EDITOR

Mr. Tony Cavanagh
16 Woodlands Drive
OCEAN GROVE
VIC. 3226
Email: tony.cav@bigpond.net.au
Phone: (03) 5255 1180

Hello and welcome to our second Newsletter for 2006.

Well, the great news is that the Dryandra book is at last a reality! Margaret and I have received advanced copies and we are expecting stock to arrive in Melbourne around 10 September with the books going on sale after 18 September. We called it *The Dryandras* and both of us are delighted with the quality of its production. We agonized over such things as whether it should have a matt or glossy finish, whether it should have a jacket or just a printed cover (like *Verticordia the turner of hearts*), even whether it should have a hard or soft cover, the colour of the endpapers (the lining inside the book covers) and a host of other seemingly trivial matters. In the end, we decided that we wanted a quality product even if it cost a bit more so went the whole hog and had a jacket and a cover, (the jacket cover picture of *D. proteoides* is really eye catching), large A4 hardback size and matt paper which is terrific as it doesn't shine and reflect light when you are reading under lights at night. The colour pictures in particular reproduced extremely well as did the hundreds of Margaret's black and white drawings of leaves, seed capsules, seeds and seedlings and her location maps; these really make the book. I personally would like to thank Margaret for her dedication to *Dryandra* over more than two decades and especially for the fantastic work she put into designing and laying out the species description section of the book. You will see this when you obtain your copy. We were always conscious of the need to try to keep the number of pages down and the book would never have happened had not Margaret designed each of the species pages, positioning all the drawings, maps and colour illustrations as well as the text so that they were uniform and no space was wasted. It would have been a nightmare for the layout/designer to try to achieve the same result from "cold".

The book will be distributed commercially by the Melbourne firm of Bloomings Books which specialises in horticultural and natural history books. Their principal, Warwick Forge, acted as publishing consultant and went to a lot of effort to ensure that the book was a quality production. I would like to thank him for having faith in us and for the advice and help he gave us along the way. Distribution to ASGAP members will initially be via the APS (Vic.) and Western Australian Wildflower Society Book Sales sections and later from other State Book Sales sections. Margaret and I will be able to supply Dryandra Study Group members via the form attached to this newsletter. Please note that all cheques should be made out to "The Dryandras", NOT to us personally. We hope that you enjoy the book as much as we have in bringing it to fruition and we thank you for your patience over the last few years. We would also like to thank the many Study Group members, both past and present who have contributed to our knowledge of *Dryandra* through letters to Margaret and their contributions to the Newsletter. When we were writing the text, material in our old Newsletters was invaluable in providing practical gardening and ecological information which we were able to include.

The Newsletter is somewhat later than normal as I have been waiting for confirmation of availability of the book. Margaret again has been traveling in far-flung areas of the state and was able to photograph fresh flowering specimens of the very rare and newly-discovered *Banksia rosserae* as well as visiting Hi-Vallee and seeing the flowering dryandras and collecting seed. She has provided information on the different forms of *D. cuneata* and pictures of plants in her garden. Again, many thanks to David Lightfoot for producing the colour pages. Thanks also to John Armstrong for updating us on dryandras he is growing in his garden at Rye in Victoria and Phil Trickett for informing us of his ongoing experiments with grafting. This is very important work because, as Phil says, dryandras are just too difficult on their own roots for nurseries to stock in NSW, ACT and Queensland; successful grafted plants may well be the answer. Lastly, I have included an article on lignotubers and dryandras although we know so little about it. I am interested in any observations of dryandras resprouting from underground after fire or other damage, and any species to add to the list.

Subscriptions are now due for 2006-2007 and a form is provided at the back of the Newsletter; again the cost remains unchanged. Some of you may have forgotten to pay your 2005-2006 subscription and if so, an "X" appears in the box. Please send your cheque to Margaret, made payable to the Dryandra Study Group.

Happy *Dryandra* growing

Tony

News from Denmark

What with the building of my house and waiting for tradesmen to come to finish it off, I haven't had an opportunity to go on any extended field trips in the last year or two – with the exception of the ASGAP Conference Northern Tour.

I expect you've all heard of the new banksia, *Banksia rosserae* discovered on Kirkalocka station, south of Mount Magnet, in 2001. It had not been seen in flower despite several follow-up visits and because it grows in the outback, red sand, Mulga country, it was assumed that it would flower opportunistically, that is, only after good rains.

Since last year the station had received drought-breaking rain so Kevin and Kathy Collins of the Banksia Farm, Mount Barker, Brian Moyle and I decided that this year would be the time to go. A visit to Study Group members, Don and Joy William's property, Hi-Vallee near Badgingarra was planned on the way back to Perth. I am anticipating a demand for seed after our book comes out and stocks are running low so both Kevin and I wanted to collect some during the trip.

We organised the trip for early March. Then the first of three cyclones in the North West caused flooding in the Murchison area with exceptional rainfall. At the last minute we had to postpone the trip until April, only to be thwarted by the second cyclone. Tracks on the property were impassable once again.

Finally, we got away in mid-May. As we drove north east of Perth, we noticed that Dalwallinu and Wubin appeared to have missed out on the good rain but at Payne's Find it was pouring and we thought, "Oh, no, not again!" All was well, however and when we arrived at the homestead we were shown the freshly picked flowers of the banksia. Two of our friends, one of whom was an original discoverer of it, had beaten us to it, the day before.

We drove out for several hours to see the banksias and found one plant in flower and another with small buds. The known populations consist of less than 30 plants. The flower heads are bright yellow, globular and pendant and the leaves are a blue-grey shade of green – very attractive but not floriferous. There were lots of other interesting plants in flower early and the ephemerals – daisies, velleias etc. were beginning to flower. Many eremophila species had already finished flowering.

Brian had to leave us the next morning to return to Perth and Kevin and Kathy and I set out for Hi-Vallee with a few diversions on the way for banksias and dryandras. There are no dryandras after Dalwallinu on our itinerary and none before Arrino-Three Springs. Around there we saw: *D. borealis* subsp. *elatior*, *D. fraseri* var. *oxycedra* and *D. trifontinalis* growing in gravelly sites and further on, on Hydraulic Road, north west of Eneabba we were really in Dryandra country. One that is fairly restricted to that area is *D. lindleyana* subsp. *media* which I think has the most attractive foliage of the *lindleyana* forms. Also in this sand and gravel heathland, (Kwongan), *D. shuttleworthiana*, *D. carlinoides* and *D. kippistiana* are common and south of Eneabba, *D. glauca* makes an appearance.

It was great to catch up with Don and Joy again and re-visit their property, part of which Don calls 'Margaret Pieroni's Dryandra Heaven'. We were lucky enough to have Don take us out to one of his special places – a huge tract of unspoiled heathland adjacent to a National Park. He had taken Tony and Liz Cavanagh and I there several years ago. It is rich in dryandras. At one spot I counted 9 without moving: *D. cypholoba*, *D. platycarpa*, *D. subulata*, *D. shuttleworthiana*, *D. bipinnatifida* subsp. *multifida*, *D. kippistiana*, *D. nana*, *D. pteridifolia* subsp. *vernalis* and *D. glauca*. Most were in bud. A few *D. platycarpa* were flowering.

Back at Hi-Vallee, in another dryandra-rich site, on the way to the homestead, we found *D. vestita* as well as most of the above. Oddly, one or two plants were beginning to flower. *D. vestita* usually flowers in summer. The rare *Daviesia epiphyllum* was in full bloom further on, with its bluish, flat, cactus-like leaves and large coral-pink Pea flowers.

We spent a day and a bit, collecting seed from Hi-Vallee before returning to Perth, then home.

If you haven't visited Hi-Vallee, it is a 'must-see' during a trip to Western Australia.

Many thanks to Don and Joy for their wonderful hospitality, once again.

Kevin and Kathy Collins' Banksia Farm at Mount Barker is the place to see most of the dryandras, all in one place and, of course, all of the banksias. Several dryandras are about to flower already, including *D. proteoides* for the first time. They have a good selection of lovely, healthy plants for sale as well. I couldn't resist getting some more to plant here although I didn't intend to grow many dryandras again.

The prostrate *D. cuneata* is flowering beautifully, at the moment. It is less than a metre long, (not tall) and has about a dozen flower heads. *D. viscida* will be out soon. These are among the plants that Kevin looked after for me after I moved from Perth and until I moved into my house last October. I have now added *D. formosa*, *D. cynaroides*, *D. calophylla*, *D. blechnifolia*, *D. ionthocarpa*, *D. lepidorhiza* and *D. fraseri* var. *crebra* Minyulo form, to my gravelly garden bed.

Unfortunately, the *D. serra* plants that I transplanted from one side of the block to the other have not done well. I think there has been too much top soil removed. I will just concentrate on planting the rest that I have grown from seed or potted up as seedlings, back where they used to be.

Margaret Pieroni 10/6/06

Dryandra cuneata

Dryandra cuneata is a winter flowering shrub to 2m. Plants growing in inland areas, e.g., around Narrogin are large and somewhat straggly. Flowers and leaves are also larger than the coastal form. Plants from the coast near Munglinup and east to Cape Arid are smaller, more compact and, though the flower heads are smaller they are much more numerous. This form makes a better garden plant. In the Stirling Range and Fitzgerald River National Parks they are intermediate in size.

At one location, east of Esperance, on a slope above the sea, a completely prostrate form occurs. It grows with *D. nivea* subsp. *nivea*, *D. pteridifolia* subsp. *pteridifolia*, and *D. obtusa*. Like the prostrate *Banksia media* from Pt. Anne in the Fitzgerald River National Park and other exposed, coastal sites the *D. cuneata* maintains its form when grown from seed.

The photos show this form growing in my Denmark garden. It has the smaller flower heads of the compact form and is flowering prolifically after only 4 years from seed.

Recently, Kevin Collins found a new population of *D. longifolia* subsp. *calcicola* growing on an exposed headland east of Stokes Inlet, about 70 km. west of Esperance. Its other locations are at Esperance and on the coast just to the west of there. It could also be growing in coastal heaths in between these known populations. Access to the coast is difficult even with 4WD vehicles. Several of the plants growing in the new population are very low-growing if not completely prostrate. We have collected seed of the most prostrate plants and Kevin will be sowing it to see whether it too will come true to seed.

Margaret Pieroni 15/6/06



D. cuneata
Denmark garden 15/6/06



D. cuneata South of Munglinup 31/8/02

Dryandras under cultivation at Rye, Victoria

My 2004 sowings were a great success from the germination aspect, with only a few losses from the potting on process. The following were successful – *D. armata*, *D. baxteri*, *D. borealis* (both subsp.), *D. mucronulata* (both subsp.), *D. plumosa*, *D. pseudoplumosa*, *D. preissii*, *D. serra*, *D. serratuloides*, *D. shuttleworthiana*, *D. speciosa* (both subsp.), *D. stuposa*. These did not germinate – *D. brownii*, *D. erythrocephala*, *D. hirsuta*, *D. horrida*, *D. ionthocarpa*, *D. purdieana*, *D. seneciifolia*, *D. stricta*, *D. vestita*.

The list below is of species currently growing in my garden. Most are doing well, except for yellowing of the foliage (those showing worst effects are marked **) Everything I have tried so far has not corrected it. I am on alkaline sand with pH of 8.5 and I now water with rainwater or treated water to bring the pH down. I have used GU49 in the potting-on mix and sprayed several times with Librel-Fe but with no visible effect on either my banksias or dryandras. I am about to try iron chelates as a foliar spray and will let you know what happens. Is it possible to use too much iron? Do you know if nitrogen might be suitable for treating for yellowing? (Yes, too much iron can definitely kill young plants and seedlings in pots so it is important to follow the manufacturers directions exactly, even if the strength seems fairly low. Doses can be repeated after a few weeks. Soluble nitrogen may work but because of your alkaline soil, it is likely that it is iron that the plants require. Perhaps try a few plants with nitrogen and some which are close by with iron chelates foliar spray and monitor the effects. We would be interested in learning of the outcome. Editor).

Regrettably, my 2005 sowing was a disaster. I used a new medium which tricked me because while the top always appeared dry, the mix itself was very wet so that most seeds rotted or if they germinated, plants died from damping off - \$250.00 worth of hard-to-get seed wasted. On a brighter note, this year I have gone back to a sand medium and things are looking much better with seedlings beginning to emerge.

John Armstrong, Rye.

+ = older plants

** = yellowing foliage

<i>acanthopoda</i>	<i>nivea</i> s. <i>nivea</i> +** (flowered)
<i>arctotidis</i> +	<i>nobilis</i> s. <i>nobilis</i> + (flowered)
<i>bipinnatifida</i> subsp. <i>multifida</i>	<i>nobilis</i> s. <i>fragrans</i> +
<i>calophylla</i> + (flowered)	<i>obtusata</i> + (flowered and set seed)
<i>carlinoides</i> + (flowered)	<i>platycarpa</i> + (flowered)
<i>cirsioides</i>	<i>polycephala</i> +** (flowered)
<i>comosa</i>	<i>porrecta</i>
<i>conferta</i> + (flowered)	<i>praemorsa</i> v. <i>praemor</i> + (flowered and set seed)
<i>drummondii</i> subsp. <i>drummondii</i>	<i>pteridifolia</i> + form (flowered)
<i>drummondii</i> subsp. <i>hiemalis</i>	<i>proteoides</i> , none thriving
<i>ferruginea</i> subsp. <i>tutanningensis</i>	<i>quercifolia</i> + (flowered and set seed)
<i>foliosissima</i>	<i>sessilis</i> v. <i>sessilis</i> + (flowered)
<i>formosa</i> + (flowered and set seed)	<i>sessilis</i> v. <i>cordata</i> (lovely foliage)
<i>fraseri</i> var. <i>ashbyi</i>	<i>shanklandiorum</i>
<i>fraseri</i> var. <i>fraseri</i>	<i>speciosa</i> ? <i>macrocarpa</i> + (red flowers)
<i>glauca</i>	<i>squarrosa</i> v. <i>argillacea</i>
<i>hewardiana</i>	<i>subulata</i>
<i>lindleyana</i> s. <i>lind.</i> v. <i>lind</i> **	<i>tenuifolia</i> v. <i>tenuifolia</i> + (flowered, also cuttings)
<i>longifolia</i> s. <i>longifolia</i> + (flowered and set seed)	<i>tortifolia</i>
<i>mucronulata</i> subsp. <i>retrorsa</i>	<i>trifontinalis</i> **
<i>nervosa</i>	<i>viscida</i> **

Dryandras and lignotubers

Most of us have a general idea of what a lignotuber is, especially in relation to eucalypts where in Victoria, the famous "mallee root" is one of the best known examples. A simple definition is "A woody, roughly spherical swelling of noticeably greater diameter than the roots and shoots which emanate from it and located just at the soil surface or buried within 10 cm of the soil surface. Its size varies from as little as 10 cm diameter to several metres across". Lignotubers are not confined to the eucalypts but can be found in many other genera including at least some species in these genera of the Proteaceae - *Adenanthos*, *Banksia*, *Conospermum*, *Dryandra*, *Franklandia*, *Grevillea*, *Hakea*, *Isopogon*, *Lambertia*, *Lomatia*, *Persoonia*, *Petrophile*, *Strangea*, *Stirlingia*, *Synaphea* and *Xylomelum*. Despite the fact that Australia probably has more lignotuberous plants than any other country and we have led the world in the study of their characteristics since 1925, it is amazing just how little is really known about the mechanisms of their functioning, why some species in the same genus have a lignotuber and others don't (and even more confusingly when you have two forms of the same species growing together, with and without lignotubers, as with *D. armata* and *D. kippistiana*, see later) and whether it is an "advantage" or a "disadvantage" for a plant to have a lignotuber. When I was looking for material for this article, I was unable to find any comprehensive studies of lignotubers in the Proteaceae and the characteristics of shoots and plants that grow from them. Perhaps this could be the topic for several PhD theses but I will try to summarise what I have learned from published papers and draw some conclusions as they might apply to *Dryandra*. I have included a table of *Dryandra* known to possess a lignotuber or have "underground stems" which may or may not have a definite lignotuber. This information was extracted from Alex George's review of *Dryandra* for the *Flora of Australia* (vol 17B, 1999) and his December 2005 article in *Nuytsia* but I would be very interested in anyone can add to the list with taxa which they believe may have a lignotuber because they have reshot after fire or foliage damage, especially those in the "underground stems" list.

In the minds of most people, lignotubers are associated with the ability of plants to reshoot after fire has destroyed the above-ground leaves and shoots. Often within a few weeks, new growth will appear from the base of the trunk and within a year or so, a rounded, multi-stemmed replacement plant has established. I believe that most *Dryandra* use this method; typical examples are *D. carlinoides*, *D. sclerophylla* and *D. tridentata*. Like cutting-grown specimens, such plants can flower early and set seed within a few years, thus giving them two chances of survival in the event of another catastrophe. More commonly seen with Eucalypts, but also with *Banksia*, *Hakea* and some *Grevillea*, is the ability for the plant to reshoot along the stems and branches after fire so that within months you have these black "skeletons" clothed in vivid new green growth. The shoots develop from dormant buds known as "epicormic buds" which are protected by thick, insulating bark during the fire. If the fire is too severe, of course, these buds can be killed and the plant will die, whereas it takes an extreme fire to kill the buds in a lignotuber. Both survival strategies are adaptations to our harsh climate and frequent fires and have evolved over millions of years. Plants with lignotubers also occur in other countries, most noticeably California, Chile and South Africa in areas which have a Mediterranean climate of dry summers and predominantly winter rainfall. The fact that not all species reshoot after fire or damage indicates that other survival strategies are possible, eg the woody fruits of most members of the Proteaceae which protect the seeds during the fire and disperse them several days after a fire has occurred, and there has been a lot of work done with Western Australian banksias looking at the differences between these two methods of survival.

The lignotuber begins forming early in the plant's life, in some cases soon after the cotyledons develop, and steadily encircles the stem and grows downwards. The ability to form a lignotuber is usually genetically inherited and does not arise as a result of damage or fire. Investigations of its anatomy show that the lignotuber contains dormant buds, carbohydrates and the nutrients needed for future bud developments. These nutrients are able to be mobilised very quickly when the stem

and above-ground parts are damaged but remain “unused” otherwise. Some lignotubers may be hundreds of years old and in eucalypts can be very large. Apparently, there is no knowledge of the role of the lignotuber in periods between disturbances such as fires.

One characteristic of dryandras (and probably other species as well) with lignotubers is that they tend to be slow growing in their early years as the lignotuber develops. I have found this with *D. bipinnatifida* and Margaret has mentioned it with *D. tridentata*. The plant is putting a lot of resources into the growing lignotuber which, as shown in one of Margaret’s pictures of the latter plant which we used in the book, (page 23) can be proportionally quite large in relation to the size of the actual plant. Another feature which I think has yet to be proven with dryandras is that those with lignotubers can withstand pruning better than those without. Certainly they can probably handle quite severe cutting back down to the main stem and reshoot from the base but with modest pruning, does *D. armata* var. *armata* (with lignotuber), for example, respond better than *D. armata* var. *ignicida* (without)? Please let us know your observations of pruning of dryandras, especially in relation to the lignotuber issue.

Another aspect which I find very puzzling, and which probably demonstrates the complexity of the whole issue of regeneration of species, is the fact that even within the same species, different populations respond differently to fire. One example is *Banksia violacea*, where some populations resprout after fire while others regrow from seed. A Western Australian species, *Lyginea barbata*, has populations which resprout after fire while in others, all adult plants are killed by fire. Within *Dryandra*, there are at least two examples where lignotuberous and non-lignotuberous forms of species grow together in a fire-prone habitat. The first is *D. armata* where both var. *armata* and var. *ignicida* can be found intermingled in an area east of Woodanilling. Similarly, with *D. kippistiana*, var. *kippistiana* and var. *paenepeccata* grow side by side north east of Badgingarra. I suppose that all this demonstrates that the matter is very complex and there are no simple answers. This complexity is also shown by surveys undertaken in the 1980s of 429 plants from kwongan vegetation in W.A. It was found that 44 possessed a lignotuber, including 24 out of 74 species of Proteaceae. Yet 163 of these 429 species were able to regenerate after fire by means of below-ground buds, ie, they could be classified as resprouters. The obvious conclusion is that possession of a lignotuber is not the only means by which plants can regenerate after damage to above-ground parts, although the authors did not elaborate on these alternative mechanisms. It seems that there is no one single strategy for survival – rather, there are a combination of structural and functional features which have evolved and allow species that grow from seed and species that reshoot to survive in a hostile environment.

In conclusion, I should mention the extensive studies of *Banksia* and other Proteaceae that have been carried out mainly in W.A. and to a lesser extent in eastern Australia, trying to understand the characteristics of survival in the two major categories of plants – those which regenerate from lignotubers and epicormic shoots (referred to as “resprouters”) and those which grow exclusively from seed (referred to as “reseeders”). There is a huge amount of information but I will summarise the main features as outlined in reviews by two of the major researchers, David Bell and Byron Lamont. I have given their references and several others in the bibliography should anyone have a burning desire to follow this up.

General characteristics of resprouters:

- Because of the multiple shoots growing from the lignotuber, resprouters tend to be “urn” shaped and rounded, with a wide basal diameter and most of their above-ground material concentrated near the base of the plant. However, quite a number of lignotuberous dryandras are prostrate with underground, fire-tolerant stems.

- They tend to have a massive, deeply-penetrating root system with horizontal roots roughly the same diameter as the main root. Much more of the mass of the plant is concentrated in the roots as compared with reseeder.
- “Since sprouters must allocate resources for fire survival, they incur a cost in reproduction and growth rate” (Cowling and Lamont, 1998, p.344). Thus, they generally have fewer flowers per plant, produce fewer seeds, maintain smaller seed banks, have slower and lower germination rates, and have lower seedling to parent ratios. They also shed their leaves more readily.
- Resprouter seedlings grow more slowly, developing their lignotubers and a deeply penetrating root system and concentrate more starch in their roots; they are also slower to flower.

General characteristics of reseeders:

- Reseeders tend to have a single, main trunk with spreading upper branches, giving rise to an “umbrella” shaped profile.
- They most commonly have a spreading, shallow, fibrous root system, and the mass of the root system may be less than one third of that of the leaves, trunk and branches.
- Because the very survival of a reseeders depends on its ability to produce adequate seed to survive a fire, reseeders have more flowers and produce many more seeds per plant, they have up to one third of their above-ground mass concentrated in reproductive structures compared with less than 20% in similar resprouters, and their seeds have higher viability and germinate more quickly, producing numerous seedlings which grow rapidly. They also tend to flower relatively early but some species may take more than 15 years to flower. Their major drawback is that unfavourable circumstances such as frequent fires, lack of rain, severe cold spells etc can cause severe seedling mortality and may lead to extinction of a species from an area.

List of *Dryandra* with lignotubers

<i>arctotidis</i>	<i>epimicta</i>	<i>preissii</i>	<i>tridentata</i>
<i>armata</i> var. <i>armata</i>	<i>erythrocephala</i> (both)	<i>prionotes</i>	<i>vestita</i>
<i>bipinnatifida</i> (both)	<i>fraseri</i> (all except var. <i>oxycedra</i>)	<i>pteridifolia</i> (all)	<i>xylothemelia</i>
<i>blechnifolia</i>	<i>kippistiana</i> var. <i>paenepeccata</i>	<i>sclerophylla</i>	The following mostly have underground stems but may not have a lignotuber
<i>borealis</i> subsp. <i>borealis</i>	<i>lepidorhiza</i>	<i>serratuloides</i> (both)	<i>aurantia</i>
<i>calophylla</i>	<i>lindleyana</i> (all)	<i>shuttleworthiana</i>	<i>ferruginea</i> subsp. <i>chelomacarpa</i> & <i>flavescens</i>
<i>cynaroides</i>	<i>meganotia</i>	<i>stenoprion</i>	<i>horrida</i>
<i>cypholoba</i>	<i>mimica</i>	<i>tortifolia</i>	<i>porrecta</i>

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Tony Cavanagh.

Progress with grafting dryandras

This is an update from the grafting trials I reported on in Newsletter 50. The good news is that in early May, all but three of the spring *Dryandra* grafts are still growing beautifully. The three I lost were due to "dieback" of the stock which initially started at the graft union. Those still with us are *D. foliolata*, *D. longifolia* subsp. *longifolia*, *D. longifolia* subsp. *arceos*, *D. fraseri* var. *ashbyi* (Eurardy form), *D. comosa* and *D. borealis* subsp. *elatior*. The "dieback" issue has been a major problem for me, with around 50% of losses of *Banksia* and *Dryandra* grafts in the first few weeks after grafting, before they have a chance to take. Interestingly, I don't have the same problem with *Hakea* and *Grevillea* grafts.

However, I am hopeful that I have solved the "dieback" problem by sealing the graft union from moisture with more robust tape. From 70 grafts undertaken since early April using the more robust tape, I have only lost two from "dieback". Of the 2006 *Dryandra* grafts, successes include *D. formosa*, *D. platycarpa*, *D. fraseri* var. *fraseri*, *D. stricta*, *D. proteoides*, *D. kippistiana*, *D. plumosa* subsp. *plumosa*, and *D. praemorsa*. Most of these are very young, so the Canberra winter could be a challenge for them. However, they are still shooting nicely despite the coolish May weather.

All effort is now geared towards the spring 2006 grafting with different *Dryandra* species. I would love to help introduce grafted dryandras into cultivation. At present, they are pretty well impossible to buy in NSW, A.C.T. or Queensland. Like WA banksias, dryandras are just too difficult on their own roots for nurseries to stock. If I can prove long-term compatibility of grafted versions, hopefully commercial grafters will become interested.

Phil Trickett
Canberra.

A.S.G.A.P. Dryandra Study Group
List of members as at 30/06/2006

Keith Alcock, Kalamunda, W.A. 6926
Ian Anderson, Hughes, ACT 2605
John Armstrong, Rye, Vic. 3041
Barbara Buchanan, Myrree, Vic. 3723
Lloyd Carman, Eden Hills, S.A. 5050
Tony Cavanagh, Ocean Grove, Vic. 3226
Kevin and Kathy Collins, Mt. Barker, W.A. 6324
Dennis Craig, Bunbury, W.A. 6230
Val Crowley, Darkan, W.A. 6392
Max Ewer, Avenue Range, S.A. 5273
Alex George, Kardinya, W.A. 6163
Elizabeth George, Alexander Heights, W.A. 6064
Hans Griesser, Gumeracha, S.A. 5233
Melinda Johnson, Aptos, California, USA
David Lightfoot, Surrey Hills, Vic. 3127
Randall Linke, Santa Cruz, California, USA
John Mahoney, Mt. Duneed, Vic. 3216
Neil Marriott, Stawell, Vic. 3380
Dr Austin Mast, Tallahassee, Florida, USA
Bob O'Neill, Wandin, Vic. 3139
Ron Pearson, Mentone, Vic. 3194
Margaret Pieroni, Denmark, W.A. 6333
Ray Purches, Wangaratta, Vic. 3678
David Randall, Cobram, Vic. 3644
Peter Ray, Mahogany Creek, W.A. 6073
Hugh Seeds, Beverley, W.A. 6304
Rodney Selby, Tunbi Umbi, NSW 2261
David Shiells, Shepparton, Vic. 3630
Jan Sked, Lawnton, Qld. 4501
Dr. Rod Sutherland, Natimuk, Vic. 3409
Kath Sykes, Hawthorn East, Vic. 3123
Lyndal Thorburn, Queenbeyan, N.S.W. 2620
Hartley Tobin, The Gurdies, Vic. 3984
Rodney Tonkin, Stawell, Vic. 3380
Phil Trickett, Ainslie, A.C.T. 2602
Liesbeth Uijtewaal-de-Vries, Neer, The Netherlands
Pat Urbonas, Armidale, NSW, 2350
Christene Wadey, North Eltham, Vic. 3095
Don Weybury, Bacchus Marsh, Vic. 3341
Don & Joy Williams, Badgingarra, W.A. 6521

Other groups and organisations

Battye Library, Perth, W.A. 6000
Library, Australian National Botanic Gardens, Canberra
Library, Deakin University, Geelong, Vic.
Library, National Herbarium, South Yarra, Vic.
Editor, *Australian Plants*, Sydney, N.S.W.
Editor, *Native Plants for New South Wales*, Sydney, N.S.W.
Editor, *ASGAP Newsletter*
Editor, *Australian Plants On-line*, and ASGAP Webmaster, N.S.W.

S.G.A.P. Regional and State Groups

Blue Mountains, N.S.W.
Canberra, A.C.T.
Fleurieu, S.A.
Maroondah, Vic.
New South Wales.
Queensland
South Australia.
Tasmania.
Victoria
W.A. Wildflower Society.

DRYANDRA STUDY GROUP

FINANCIAL STATEMENT 1/7/05 – 30/6/06

Cash at bank at 1/7/05		\$2032.36
Income	Members' subscriptions	368.00
	Donations	133.00
	Sales of publications etc.	26.00
	Bank interest	8.12
		<u>535.12</u>
	Total	<u>2567.48</u>
Expenses	Book and newsletter expenses	950.00
	Stationary, postage, photocopying etc.	200.00
	Bank charges	8.70
	Postage of proofs	66.70
	Total	<u>1225.40</u>
Cash at bank at 30/6/06		<u>1342.08</u>

DRYANDRA STUDY GROUP

SUBSCRIPTIONS FOR 2006- 2007

The group's year runs from July 1, 2006 to June 30, 2007 Subscriptions are \$8.00 for Australian members and \$10.00 for overseas. Please make cheques payable to the Dryandra Study Group and forward to Margaret. Thanks to all those who have paid.

Name: _____

Address: _____

COMMENTS OR SUGGESTIONS FOR INFORMATION:

