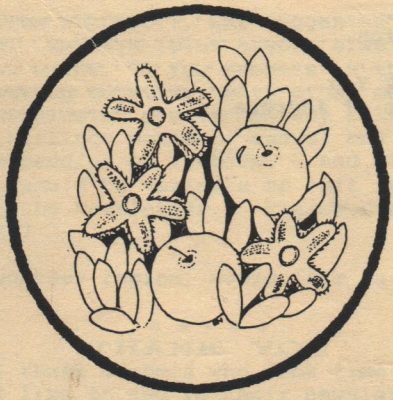
Advice David Bainbridge, Yarra.

Chiltern Seeds Bortree Stile Ulverston LA12 7PB

724A Isopogon lanemonifolius (Poiret)

NEWSLETTER OF THE AUSTRALASIAN PLANT SOCIETY

PENTACHONDRA



ISSUE 14 MAY 1995

AUSTRALASIAN PLANT SOCIETY

Newsletter No. 14

May 1995

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EDITORIAL

The 1995 AGM is to be held at Wakehurst Place, Sussex on Saturday June 17. The plan is that members meet at 11.30am, have a guided tour at 11.45 (with particular emphasis on the Australasian collection), then have lunch (about 1.15pm) at the restaurant (NOT paid for by the APS!), followed by a short AGM in the restaurant. Members can then wander around themselves in the afternoon.

The APS will pay for the entrance fee for members, though this is complicated : £4 normal, £2 pensioners, reducing by 20% if we are more than 10, but National Trust members get in free; and for the cost of the guided walk (£1 each). Therefore it would be very helpful if those members intending to attend could let us know beforehand; also if they are pensioners. If you are a N.T. member, don't forget your card!

Hopefully this venue will attract some of the many southern members.

Jeff Layman will have room in his car to ferry two members from Three Bridges Station, Crawley to Wakehurst. If anyone is interested, contact Jeff at 27 Fenhurst Close, Horsham, W Sussex, RH12 1UX.

* * * * *

POSSIBLE NORTHERN MEET?

Dennis Rowlinson, from Stockport, has suggested a possible get-together for his local members (plus anyone else who is wishing to travel!). In his own words, "A few members in the East Cheshire area are interested in meeting together, with other members, to discuss the cultivation of Australasian plants and any related subject. It is intended that the meetings would be casual and would occur 3 or 4 times per year - depending on response - and all members would be welcome. The venue would be variable to suit interested parties and will be announced in the Newsletter." Please contact Dennis if interested on 0161 483 4877.

If anyone else, in another region, would like to form a similar group, let us know.

* * * * *

THANK YOU

Many thanks to all those members who took time to write and let us know what they would like to see in their newsletter. Also thanks for the compliments. We'll try hard to include those wanted articles, but please remember, that some of the best articles are those written by members themselves about their own experiences of growing Australasian plants. So, while you are sitting in your deckchair this summer, think about putting pen to paper!

Special thanks to Maria Martin and John Angrave for their donations to our seedbank. Also special thanks to Dennis Rowlinson who has raised £24.00 from the sale of rooted cuttings. Dennis still has the odd plant for sale (see last issue for list of cuttings) - it is recommended that you contact Dennis to see what plants he still has available; 0161 483 4877. Dennis is also looking for a source of Coir blocks without the feed already in it. He has found using 'straight' Coir to

make composts up for Australian plants very useful but his usual supplier no longer stocks it. Contact : see Members List.

PENTACHONDRA PUMILA

You will have noticed that your newsletter now has a new cover design. Pentachondra is a genus found in both Australia and New Zealand. The illustration is of the flowers and fruit of P. pumila. Several times Jeff Irons has suggested to me that 'Pentachondra' would make an excellent name for the newsletter, and at long last I've taken notice!

P. pumila is widespread in the alpine areas of southern NSW, Victoria and Tasmania, and in grassland and alpine habitats from Auckland to Stewart Island. Also known as the carpet or cushion heath, Pentachondra pumila is a prostrate perennial woody herb upto 12cm high, forming dense mats of crowded stalkless fleshy leaves, 3-6mm long x 3mm wide. The flowers are white, occasionally red, tubular, 3-4mm long x 6mm across with 5 spreading hairy petal lobes. The flowers are followed by crimson berries 6-8mm in diameter, and it is quite common to see both flowers and fruit at the same time.

RHODODENDRON LOCHAE

The 1995 APS seed list includes Rhododendron lochae. This, Australia's only rhododendron, is in the Vireya section. Vireya seed has a short life, often no more than a month. Our seed has been kept in a refrigerator, in the hope that it will stay viable.

Vireya rhododendrons usually take 3 to 5 years or more to flower from seed. Lyn Craven, a taxonomist at the Australian National Herbarium, has reported that if seedling cuttings are taken they will flower in 18 months.

The technique is to take cuttings of minute seedlings (about 2-4mm high). At this height they have 3 leaves and the cut is made below the cotyledons. They are rooted in live sphagnum. Vireyas strike readily with mist or in a closed frame with hand misting. Bottom heat is desirable.

The method has been used for Calytrix, which is another group of plants which can become 'dormant' when in the seedling stage.

GETTING WHAT YOU PAY FOR

A few nurseries offer plants called Grevillea thyrsoideus. This is a species from Western Australia which is unlikely to be hardy outside. Its leaves form a V shape on the branchlets and the inflorescence is one sided like a toothbrush. In spite of the specific name, it is not thyrse shaped.

Any plant without these characteristics cannot be G. thyrsoideus. One nursery was offering a plant with needle-shaped leaves and red cluster flowers as G. thyrsoideus. We were able to key it out as G. rosmarinifolius.

These notes have been written for people with no prior knowledge of the subject. We hope that they succeed in their aim, and that they do not prove to be too tedious for the more knowledgeable.

Seed Germination

Some of the seeds offered in the APS seed lists will germinate immediately, others will not and require special treatment before they germinate. This is not at all unusual. Many familiar plant seeds have similar special needs. A good example is that of Hellebore seeds. They are programmed to germinate after a warm spell which has been followed by a cold spell. So seed saved from your own plants and sown immediately will come up in the following spring. Seed bought, or obtained from a seed list and sown on receipt will exhibit delayed germination. The first winter was superfluous, and has no effect on the seed's built in programme. Sometimes as in this example we know the conditions needed for germination, often they are not known, and one can only sow and live in hope. As a general rule the APS does not offer seed of species which are known to be very difficult to germinate.

Viability

The seed we obtain has been offered to us in good faith, but it is not always viable, and unviable seed will never germinate. As an example, seed from members of the daisy family often contains much non-viable seed, so much that it is not practical to separate it out. If you look at the contents of a packet frequently wou will see that many of the seeds are thin [often pale too], while others are plump. Only the latter are viable, and only they have the ability to germinate. Unfortunately nature often has other ideas! Wild collected Craspedia seed nearly always gives a low germination rate. If the seeds are examined under a microscope nearly all the plump ones will be seen to have a small hole in them. The seed has been attacked by boring insects and the embryo, or possibly the whole kernel, has been eaten. Other species also suffer from the depredations of these insects.

Dormancy

When a seed does not germinate immediately it is said to exhibit dormancy. There are three main types of dormancy, and each has to be treated differently. They are :

seeds with a hard coat
seeds containing chemical inhibitors
seeds with a dormant embryo.

To date some seeds have defied all efforts to make them germinate. The APS does not normally offer them in its seed lists.

Dormancy is a complex subject and a detailed treatment is beyond the scope of these notes.

Seed Sowing

Wild seeds have a habit of popping up in such spots as garden walls and the cracks between paving stones. These places provide a growing environment which is moist, yet well drained, with plenty of air between the particles. Seed mixes have to do the same, and many

materials can be used to provide them. There is no 'magic mix'.

Seeds germinate best in a slightly acid medium, and a lime free compost is recommended, even for plants which are lime tolerant. Seeds contain their own food supply, so no fertiliser is required. In fact a nutrient free compost encourages seeds to make roots, but a nutrient rich one discourages root formation. Because it is alkaline Vermiculite is unsuitable for seed composts, but Perlite can be used. Rounded grain sands hold less water between their grains than angular grained sands, so if sand is used it should always be 'sharp', ie with angular grains. Sand or Perlite alone can be used as the seed sowing medium, but it is advisable to add some organic matter in order to help water retention. These is no substitute for peat, and while peat replacements have their place in potting composts they should not be used in seed composts. Two mixes which have found favour with APS members are 1 part of peat to 1 part of perlite or coarse sand by volume, and a 1:2 mix.

Seed should be sown on the surface of the compost and one half of the surface covered lightly with coarse sand. This is because some seeds need light in order to germinate, and very little is known about which ones they are. If the surface is part covered it ensures that some of the seed will receive light. There is no need to press down the compost before sowing. Flattening reduces the air pores in the compost, and it is better to leave it to settle naturally.

The compost must be kept moist. This can be achieved by placing the seed pot in a plastic bag which has been closed with a tie, or by placing a plastic soft drink bottle [PET bottle] over it. Needless to say the compost should be moistened first.

The 'Bog Method' has been used with great success for many Myrtaceae - Beaufortia, Callistemon, Eucalyptus, Kunzea, Leptospermum, and Melaleuca. The seed is surface sown on a medium which is saturated with water. All that is needed is to stand the seed pot in a shallow tray of water, which is replenished to a constant level. More sophisticated variations include partly burying the pot in a sand bed which has been fitted with a constant head device.

Dark

Studies on cyclamen seeds have shown that some species will only germinate in the dark. Ants drag the seeds into their nests, then eat the covering of the seed, which then germinates. Ants are known to be important dispersal agents for many Australian species, but the APS has not been able to find any information about dark requirements for germination.

Transplanting

Seeds can be transplanted as soon as they are about 1 cm high, or whenever they get their first pair of true leaves, whichever comes earlier. Epacrids [Dracophyllum, Epacris, Richea etc] are best transplanted when they are 12 or more months old. They have very fine roots, and it may be found easiest to transplant small groups of seedlings. This will cause less damage to the roots than separating the seedlings. Species with one seed leaf [monocots] are usually left for a year or more before transplanting. Often tiny seedlings will be found to have very long roots. If transplanted like that their roots

will coil round the new pot. This is undesirable, so do not be afraid to pinch off excess root length between finger and thumb. Some species, such as many Gaultherias, are very slow growing. A decision has to be made whether to tranplant them, or to leave them in the seed pot for a year or so. If transplanted when very small the seedlings may die, and on balance it is preferable to leave them in the seed pot and give liquid feeds. When this is done further germination often occurs as the seasons progress.

Potting On

The majority of Australasian and New Zealand plants will grow well in a slightly acid mix, with a pH around 6. Many commercial mixes contain large amounts of lime, so should be checked before use.

There is no reason why the majority of plants in the world should not be grown in just one potting mix. If making your own you need to ensure that:

The compost is open and holds large amounts of air. In technical terminology the Air Filled Porosity [AFP] is around 15-20%. This means that if you water the compost to saturation, then allow it to drain, the water which drains out should amount to 15-20% of the pot volume.

The total water holding capacity should be about 50%.
The pH should be around 5-6.
Nutrient levels should be adequate.

The principal exceptions to this are:

commercial plants which have been bred for very high nutrient levels eg. tomatoes;

those with a need for a very high level of one nutrient eg. asparagus needs boron;

those which need humid air round their roots eg. tropical epiphytic orchids;

those which find 'normal' levels to be toxic. Many proteaceous plants and some acacias find 'normal' soil to have too much phosphorus in it.

Phosphorus Toxicity

This is a problem only with soil-less potting composts. If a compost contains some soil the clay particles in the soil will 'lock-up' phosphorus so that it becomes unavailable to plants. It is good practice to put between 1/10 and 1/6 by volume of soil in potting composts. Superphosphate fertilizer should never be used.

Iron

Phosphorus sensitive species respond to high phosphorus levels by also not being able to use iron properly. The young leaves are yellow and often old leaves die from the tips downward. If this happens flush out the phosphorus with water, then add an iron chelate such as 'Sequestrene'.

Fertilizers

Do not use anything other than slow release fertilizers. Synthetic brands are Ficote and Osmocote, and organic ones are hoof and horn or dried blood. Bonemeal is simply slow release calcium phosphate so should not be used.

Remember that although one compost mix will suit all your plants, they do have different nutrient needs. It is difficult to remove an excess which was added at the start, but you can always add supplementary food through a liquid feed. It is better to be sparing rather than generous with the initial fertilizer addition.

Some composts do not wet easily. Never add washing up liquid or laundry detergent to your water as a wetting agent. These substances contain salts which may be harmful. Garden suppliers sell wetting agents suitable for horticultural use, and one application will last about 3 months.

Temperatures

Many of the seeds in the APS seed lists will not germinate well at temperatures below 20°C. Some, especially Proteaceae, will actually rot if sown in cool conditions. Where optimum germination temperatures are known they have been given. In practice it has been found that seed sown under cover gives better germination than seed which has been sown outside. It is sufficient to place pots on a greenhouse bed bench, and to cover them with a loosely laid sheet of polythene. Capillary matting or a moist sand bed underneath seems to help. Some alpine plants germinate better in cool conditions.

Leaching

Where leaching is recommended the preferred method is to place the seed in a mesh bag, together with a stone as weight, then to immerse it in a lavatory cistern for a few weeks.

Cool Moist Stratification

This is the name given to exposure of seed to cold, while it is moist. An alternative name is vernalization. Stratification causes chemical changes to take place within the seeds. These changes stop when the seed is frozen, and some seeds can actually be harmed by being frozen when they are moist. Very little is known about the lengths of time required for stratification by different species, or whether fluctuating temperatures are better then constant ones. Over winter it is usually sufficient to keep pots in a frost free greenhouse. If a late summer sowing is wanted from seed which was received in spring, mix the seed with moist sand or peat, place it in a container or a polythene bag closed with a tie, then place in a refrigerator at 2-4°C. Check periodically to ensure that the seed does not dry out. Another method is to place a piece of moist sponge in a Petri dish, lay a piece of filter paper on it, put the seed on the filter paper, put on the lid, then place the dish in the refrigerator. Seed can be inspected every 10 days or so, mouldy seeds removed and any that are seen to be germinating removed and sown.

Growing on in the Garden

The three golden precepts are drainage, drainage and drainage. If your soil is not well drained do make some raised beds before you put anything out in the garden. The amount of elevation need not be

great, 15cm is sufficient. Fill the raised bed with any free draining material, even grit or coarse sand will do.

Planting holes should be wider than they are deep, and there is no need to mix organic matter with the soil. In fact as it rots down organic matter uses up nitrogen, so depriving the growing plant. What is important is to ensure that the plant roots are spread out well, and not coiled up. Twisted roots should be cut off with secateurs. Remember too that excessive tamping down squashes soil and reduces the air space in it. Many growers do not tamp after planting at all.

When shuffling existing plants around in the garden do not reduce the leaf area. The young leaves on the subsequent new growth will transpire more water than the older thicker leaves would have done, and so increase the water stress on the plant.

Specific Recommendations

Acacias

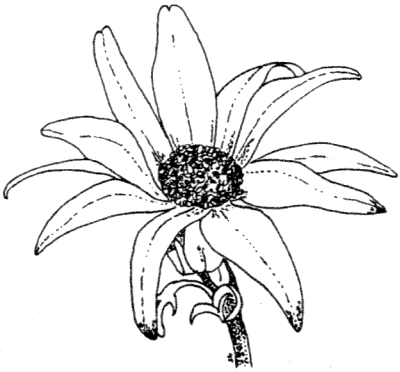
Pour boiling water over the seeds and let them stand overnight. Seed that floats after the water has been poured on [try to sink it] is either infertile, empty or eaten, and should be removed. The seed can be sown in the conventional way, but the following method gives better control. Place the seeds between moist paper [filter or blotting] in a Petri dish or between the divisions of a plastic ice cube tray [put the tray in a plastic bag]; place in a warm spot and leave till the radicle [emerging shoot] is about 10mm long. Then plant the seeds individually. Germination often occurs just as the paper is beginning to dry out. Presumably this is when the oxygen:moisture ratio is at the correct level. Remoisten the paper as required though. Remove any seed which goes mouldy, it is non-viable and will not germinate. Two species A. suaveolens and A. terminalis should be treated with water below 80°C, as boiling water will kill their embryos.

Acaena

A. caesiiglauca, glabra, microphylla and saccaticupula germinate best with light.

Actinotus

Commercial seed of A. helianthi from cultivated stock usually gives good germination within 2-3 weeks. Wild seed often takes 80-100 days before it germinates. APS members have obtained low germination of A. forsythii within 30-60 days. In Australia A. helianthi is usually grown from cuttings.



Actinotus helianthi

Agastachys

Usually gives good germination the spring after sowing. Keep at 0-5°C over winter.

Agathis

Has a short life and most seed has lost its viability when received. If fresh seed can be obtained germination is good.

Allocasuarina

Germinates well at 15-20°C. Transplanting losses can be high, good hygiene is essential.

Anigozanthos
Usually problem free, but A. pulcherrimus and A. rufus are difficult. The best germination comes in the second summer after sowing. Pots should be allowed to bake in the summer sun, and then be moistened in the autumn. They should not be allowed to freeze over winter.

Araucaria
Seed has a short life. Fresh seed germinates well.

Aristotelia
The members of this genus [and its family] do not usually germinate well. APS members have found that fresh seed of the Australian and N.Z. species germinates freely. Stored seed gives a reasonable germination the spring after sowing. Pots should be kept frost free over winter. There are inhibitors in the flesh surrounding the seeds, so they should always be washed out from the fruits. The seed coat also contains inhibitors, which break down during stratification. A. serrata needs stratification.

Banksia
Sow 2 seeds to a pot, then thin to one seedling, use a 20 cm pot and an acid free draining mix. Seed is not always viable. Though long lived in an un-opened cone, it is fairly short lived after release. Sometimes the seed has been subjected to insect attack. The three hardiest species, B. canei, integrifolia and marginata need moist cold stratification for at least 6 weeks before sowing. That may be insufficient, and the seed may not come up until after another winter.

Bellendena
Only green seed can be germinated with any degree of success. Not offered by APS.

Billardiera
Fresh seed germinates well. It should be removed from the fruits, then washed in cold water before sowing. A number of treatments has been suggested for stored seed, but none is really effective. Try pre-treatment with boiling water, or leaching with running water for 6 weeks.

Blancoa
Seed given boiling water treatment has up to 6 per cent germination. Untreated seed has a low germination rate. Seedlings damp off easily.

Boronia
Seed exhibits both physical and chemical dormancy. In general species from Western Australia germinate more easily than the eastern species. In Australia Boronias are propagated from cuttings. Boronia megastigma is usually given boiling water treatment. Another method is to nick the seed coat and leach with running water.

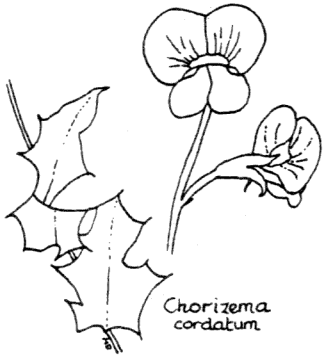
Callistemon
Easy by the Bog Method. Sow very thinly. Seedlings can be left for several weeks before transplanting.

Calomeria
Much seed is often empty husks. Sow between May and September, plant out the following spring.

Carmichaelia
Soak overnight in water or nick seed coat before sowing.

Celmisia
Seed has a short life, good seed germinates well. Beware of commercial seed, much of it is usually infertile. Even good [plump] seed has often been attacked by insects, so is moribund. Several species need light, possibly all do. Seedlings should not be transplanted until they are a year old.

Chorizema
This is another hard coated seed.
It should be treated with water below 60°C.



Clematis
Germinates best at 10-15°C.

Coprosma
C. lucida needs light.
C. repens needs stratification.

Cordyline
C. australis needs light and stratification.

Correa
Seed straight from the plant will often germinate quickly. Stored seed contains inhibitors. A recommended treatment is to store the seed at 1-5°C for 12-18 months before sowing. Some species put out a shoot first, others put out a root and shoots follow a year later.

Crowea
Treat as Banksia.

Cyathodes
Have a very hard seed coat and embryo dormancy; not offered by APS.

Dacrycarpus
D. dacrydioides and cupressinum need stratification.

Dracophyllum
Seed often has a short life, but with some species germination is good after 1 or 2 winters [eg D. traversii]. D. traversii needs light. Do not transplant until at least a year old.

Drymophila
Should come up in the autumn after its first summer. Do not allow to freeze over winter. Should either be sown a few to a pot and not transplanted, or transplanted with care when a year old.

Elaeocarpus
E. dentatus needs stratification.

Eremophila
It used to be thought that seed had to pass through an emu before it would germinate. Nowadays it is known that most seed is non-viable. Some samples contain as much as 1% viable seed. It germinates well.

Eriostemon
Treat as Boronia.

Eucalyptus
The following need moist cold stratification: amygdalina, delegatensis, dives, elata, glaucescens, kybeanensis, nitens, pauciflora, pauciflora ssp. debeuzevillei, pauciflora ssp. niphophila, perriniana, regnans, stellulata. Some authorities recommend 3 weeks cold moist stratification for E. coccifera and E. vernicosa. APS seed should be good, but some British commercial firms have sold seed which had been collected while immature. Most seed is non-viable and is mixed with chaff which cannot be separated out. There is usually 10-20% viable seed, vernicosa often has much less.

Gaultheria
Best sown on sieved dried sphagnum; light required.

Gentianella
Some germination after 1-2 years, pots should be kept for a least 5 years.



Gentianella diemensis

Gompholobium
Give boiling water treatment.

Grevillea
As with many other Proteaceae seed will rot if sown under cool conditions. Sow as for Banksia. A little dolomite in the potting compost is recommended.

Hardenbergia
Treat with water below 80°C.

Hedycarya
H. arborea needs stratification.



Grevillea wilsonii

Hibbertia
Has few viable seeds. Germination peaks at 30-50 days after sowing when temperature around 20-25°C.

Hibiscus
H. trionum probably needs both light and a high diurnal temperature range.

Hoheria
H. glabrata needs stratification, no information about sexstylosa. H. populnea probably needs light.

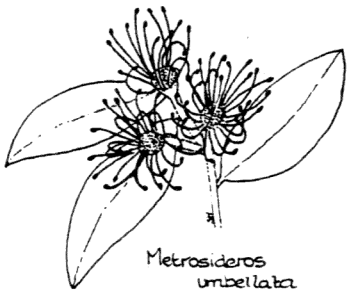
Kennedia
Treat with water below 80°C.

Lechenaultia
The only practical method is to sow immature seed on an agar gel. Mature seed has a very low germination rate.

Leptospermum
Responds well to the Bog Method, so even though only about 20% is viable sow thinly.

Macropidia
Comes up in the second autumn after sowing, see Anigozanthos. This may be one of the species which responds to smoke. Try exposing the seed to smoke from a bonfire.

Melicytus
M. ramiflorus needs stratification; possibly others do too. Remove fleshy coat before sowing and leach.


Metrosideros umbellata

Metrosideros
M. umbellata needs light.

Myosotidium
Must not be allowed to dry out.

Myrsine
M. australis needs stratification.

Olearia
Much seed has empty husks or is non-viable. Good seed germinates well. O. frostii exhibits both immediate germination and germination after stratification. O. ilicifolia needs light.

Paraserianthes [Albizia]
Treat with hot water. Since the temperature is not specified, 60°C or below is suggested.

Pennantia
P. corymbosa needs stratification.

Persoonia
Not easy. Give the seed a summer baking in the sun, to split the seed coat. Usually takes two years or more.

Petrophile
Staggers germination over several years. Keep frost free over winter.

Pimelia
Give the seed pot a good baking in the sun for at least 2 summers, keep moist over winter but do not freeze. Some alpine species will give immediate germination of a few seeds.

Pittosporum
If seed is received whole wash it free of the sticky material. The name Pittosporum means pitch seed, and dry cleaning fluid has been suggested as a suitable solvent for easy separation. Whether it damages the seed is not known. The seeds themselves have germination inhibitors in the seed coat. It should be leached out with running water. P. crassifolium, eugenioides, and tenuifolium need stratification.

Ptilotus
Most 'seed' consists largely of empty husks. Few of the full ones are viable. There are no problems with the few seeds that are viable.

Podocarpus
P. totara needs stratification.

Prumnopitys
P. ferruginea and taxifolia need stratification.

Ranunculus
Stratify seed, keep at least 2 winters, best transplanted when 12-24 months old.

Rhopalostylis
R. sapida needs stratification.

Solanum
Pre-chill seed before sowing. Best at 25°C. APS seed will have been stored in a domestic refrigerator at 2-4°C. Trials with S. aviculare and S. laciniatum gave immediate germination.

Trachymene
Fresh seed is said to germinate well at 15-20°C. Stored seed [which is what is obtained in Britain] contains inhibitors which may take several years to break down. Germination is best at 20-25°C.

Trochocarpa
Stored dry seed germinates poorly if at all. The APS tries to supply seed in its drupes which has not been allowed to dry out. Scrape the seeds from inside the fruit and surface sow. Seedlings can be transplanted in their first year.

Vitex
V. lucens needs stratification.

Seeds known to need light for germination

Species	Optimum temperature °C
Agonis flexuosa	25
Beaufortia sparsa	25
Calothamnus	not known
Callistemon citrinus	30
Callistemon linearis	30
Callistemon rugulosus	30
Callistemon phoeniceus	30
Callistemon polandii	30
Eucalyptus dalrympleana	20-25
Eucalyptus glaucescens	20-25
Eucalyptus globulus	20-25
Eucalyptus gunnii	20-25
Eucalyptus leucoxylon	20-25
Eucalyptus nitens	15-20
Grevillea robusta	not known
Leptospermum flavescens	30
Leptospermum rotundifolium	25
Melaleuca laterita	25
Melaleuca preissiana	25
Melaleuca saligna	35
Melaleuca viridiflora	30



Eucalyptus globulus
fruit

Some Australian Plants known to have high germination temperatures.

	Temperature °C
Amaranthaceae	
A. clementii, exaltatus	30
Apocynaceae	
Alstonia actinophylla, spectabilis	30
Araucariaceae	
Araucaria heterophylla	20-30
Areaceae	
Archontophoenix alexandrae, cunninghamia	30
Corypha elata	30
Gronophyllum ramsayi	30
Hydriastele wendlandiana	30
Licuala ramsayi	30
Livistona alfredi, eastoni, inermis	30
Normanbya normanbyi	30
Ptychosperma elegans, macarthuri	30
Casuarinaceae	
Allocasuarina deccusneana	30-35
Allocasuarina littoralis, torulosa	30
Casuarina obesa	30
Combretaceae	
Terminalia canescens, ferdinandiana	30
T. petiolaris, platyphylla, platyptera	30
Convolvulaceae	
Ipomoea brasiliensis, davenportii	30
Porana sericea	30
Cupressaceae	
Callitris drummondii	30
Euphorbiaceae	
Petalostigma pubescens	30
Haemodoraceae	
Anigozanthos gabrielae	36
Anigozanthos rufus (needs GA)	26
Anigozanthos viridis (soak in sulphuric acid or water at 55-60)	21-40
Blancoa canescens (after boiling water)	32-35
Lecythidaceae	
Barringtonia acutangula	30
Planchonia careya	30
Malvaceae	
Abutilon fraseri	30
Gossypium robinsonii, sturtianum	30
Hibiscus arnhemensis	32-35
Hibiscus panduriformis, superbus	30
Hibiscus trionum	28
Lavatera plebeia	25
Sida cleisocalyx, macropoda, platycalyx	31-35
Thespesia populneoides	30
Myoporaceae	
Eremophila bignoniiflora, latrobei, leucophylla	30
Pandanaceae	
Pandanus aquaticus, spiralis	30
Proteaceae	
Banksia aemula	28-32
Banksia dentata	30
Grevillea banksii	25-33

Grevillea pteridifolia	36
Hakea arborescens	30
Petrophile macrostachya	18-74
Rhamnaceae	
Alphitonia excelsa	30
Rubiaceae	
Gardenia pantoni	30
Nauclea coadunatus	30
Solanaceae	
Nicotiana amplexicaulis, glauca, rosulata	30
Verbenaceae	
Clerodendron cunninghamii	35-63
Zygophyllaceae	
Nitraria billardieri	30-40

If you have any comments and/or suggestions for improvement to these notes, please feel free to inform your society's secretary or editor.

If anyone has had experience of the use of Polyethylene glycol (PEG), would they be willing to write us a short article?

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A lot of interest has been shown following the article in Issue 13 on smoke treatment as an aid to seed germination in Australia and South Africa. One member prompted to write something is the APS Treasurer.

CARRY ON SMOKING!

By Dr. Tony Entwistle

Recent research in South Africa, and then in Western Australia, has shown that smoke treatment has remarkable effects on the germination of many indigenous seeds that had proved very difficult or impossible to germinate under cultivation.

There was an excellent exhibition of this at the Wildflower Show at Kings Park, Perth in September. In both countries fynbos and bush fires are an essential part of the natural regeneration cycle. Whilst the heat of a fire is known to release seeds of many plants with hard woody cases, eg Banksias, this is not responsible for the actual germination though for some species the heating of the soil after a bush fire seems to be part of the double-dormancy required for germination ie. cool period followed by hot one, or even a very hot one!

Smoke is a very complex mixture of many chemicals - ethylene, nitrogen dioxide, nitrosamines, benzpyrenes and complex tars. Future research will no doubt identify the actual substance. It is obviously something which 'sticks' to the soil. It has long been known that the ethylene in the smoke of bush fires stimulates the subsequent emergence of the huge flower-spikes of grass-trees (Xanthorrhoea and Kingia), and is probably the chemical responsible in the practice of 'smoking' dormant Narcissus bulbs to increase their flowering.

Many chemicals do improve germination in some plants - as well as ethylene, gibberellins, hydrogen peroxide, ammonia and thiourea. Seeds which have been shown to germinate readily after 'smoking'

include the South African Restios, helichrysums and Ericas, the Australian Epacrids, Goodeniaceae, smoke-bushes (Conospermum), Hybanthus and Verticordia (always remembering that many South African and Australian seeds have a low proportion of viable embryos). The professionals are using a metal drum for their 'bonfire' with air forced through from an electric pump. The smoke taken from the top and piped to a plastic tent in which the seedtrays are placed. They are given an hour's fumigation, by which time the soil does smell of smoke. The time needed for the smoke, and the concentration are still guesswork but no doubt will be more scientifically assessed in time.

As well as fumigation, treating seeds with aqueous smoke extract has been shown to be nearly as effective.

Extracts of charred wood do not seem to work as well. I have experimented a little - Anigozanthos have done very well.

It is possible to 'smoke' a seedtray or a few pots by getting a small bonfire going, damping down with wet leaves and covering the fire and tray (put alongside) with a large cardboard box (a metal one would be best), raised a little of the ground and with a small outlet at the top. However this needs a constant watch as more leaves must be put on when the bonfire threatens to burst into flames!

Burning dried grass or straw on top of the seedbed has also been tried and seems to work.

I wonder if simply putting a lighted cigarette inside a seedpan and covering with a plastic bag would work!

Smoke treatment does not necessarily speed up germination, which may take many months, and need several hot/cool spells. There seems no doubt that many South African and Australian seeds lie dormant for many years until the next bushfire, which can average 4-20 years.

The best results were from an autumn sowing. You can now buy 'instant smoke plus', which is dried absorbent paper containing fynbos smoke to which you add water to make a smoke extract in which you soak your seeds before sowing. It costs £6.50 a packet and can be obtained from the National Botanic Institute at Kirstenbosch (Private Bag X7, Claremont 7735, RSA). This seems rather expensive for 'smoky paper' and it might be worth trying a DIY way of putting damp blotting or kitchen towelling on a smoking bonfire and then dissolving this in water to make your own extract. Or you could try simply sowing onto the smoked paper. Whatever method you use, it is important not to wash the 'smoke' out of the soil and to dampen only with a fine spray.

It is possible that smoke would help seeds other than South African and Australian ones, ie from the northern hemisphere; we do have heath fires, and in the Mediterranean garigue and maquis fires.

References:

Brown, Kotze and Botha. Promotion of seed germination of Cape Erica spp by plant-derived smoke. Science Technology 21, 179-185.
Brown, de Lange, van Staden & Baxter. Plant-derived smoke. Proceedings of 3rd International Conference on Environmental Issues August 1994 Curtin University of Technology, Perth, WA.

EDITORIAL NOTE: In 1986 the Brooklyn (USA) Botanic Garden reported that charred wood contained germination stimulators for chaparral plants. The domestic application is: char a piece of wood, grind up the charred material, add water and soak overnight. Pour some of the water into the seed growing mix.

Ref: Sterling C Keeley & Marie Pizzorno "Charred Wood Stimulated Germination of Two Fire Following Herbs of the California Chaparral and the Role of Hemicellulose." Amer.J.Bot.73(9). Sept.1986, 1289-97.

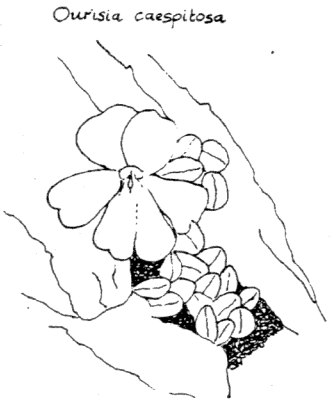
This treatment could be tried on recalcitrant Australian and South African species as an alternative to smoke.

OURISIAS

By Sue Hyams

The Ourisias are sometimes called mountain foxgloves; in fact they belong to the same family, the Scrophulariaceae.

Brief notes on 4 species, native to New Zealand, which would make interesting additions to the alpine collection :



Ourisia macrophylla, found on the wetter mountains in the North Island, provides good ground cover for a moist peaty corner. It forms spreading mats, upto 45cm, of rounded, dentate, mid-green leaves. Spikes, upto 25cm long, of pure white tubular flowers with a throat of yellow hairs are produced in July.

Ourisia macrocarpais is found on the South Island, again on moist ground. Large light green leaves are joined in summer by large pure white flowers upto 8 in a head on stems upto 45cm long.

Ourisia sessilifolia, in New Zealand, is found in damp shady sites at high altitudes close to snow patches during the summer. The plant forms flattened rosettes of neat green hairy leaves from which, rise on short stems, clusters of five-petalled flowers, usually white, but occasionally with a mauve tint.

High in the Southern Alps O. caespitosa is a small tightly mat-forming species with grey-green, notched leaves and slender wiry stems bearing clusters of white flowers. O. caespitosa gracilis is even neater. Its pure white flowers with a yellow centre sit atop glossy foliage on hair-like stems, no more than 5cm high. It grows best in a peat garden in moist lightly-shaded places.

SNIPPET - APHIS CURE

From the Australian journal 'Your Garden', July 1969 - cut 1lb onions into small pieces, pour boiling water on them, stand 10 hours. Add cold water to make up to 2 gallons. Water around plants with root aphids, then apply the onion water.

GARDENER'S QUESTION TIME

Q. My Kentia Palm is now 2m high and across. It has 3 trunks. What can I do to reduce its size?

A. In Arab countries, palms are simply dug up and put around new houses. Often their fronds are tied up for a week or two while the palm re-establishes. Because of this there seems to be no reason why you should not simply detach one of the smaller trunks by sawing through close to the main trunk. Put the detached trunk complete with roots into a new pot. You could spray its fronds with S600 transplanting spray. This will reduce water loss. If you have difficulty finding it, the chemical is also sold as 'Christmas Tree Spray'.

Kentias are now called Howeas and both species are found only on Lord Howe Island.

* * * * *

Q. I have a nice sunny patio and a garden with wet, heavy clay soil. What Australian plants can I grow in pots?

A. Since you live in the Midlands pot grown plants stand a real chance of 'death by freezing' over-winter. You would be advised to stick to annuals or quick growing plants.

Recommended plants include Brachyscome multifida and B. rigidula. Both have pink, white or blue daisy flowers, but B. rigidula is the shorter. The perennial Wahlenbergia gloriosa will give you blue flowers all summer, as will the tender Viola hederacea.

Everlastings are excellent - Schoenia, Rhodanthe, Waitzia, Bracteantha, Leucochrysum. The mass seedsmen still offer them under the old names of Helichrysum and Helipterum.

Kennedias and Chorizemas will make excellent trailing plants. You will have to raise them yourself.
Prostanthera cuneata will make an excellent small shrub, probably hardy. The selection "Alpine Gold" is more upright.

* * * * *

Still on the theme of container gardening, Dennis Rowlinson tells us about his experience of growing plants in pipes.

'Clay drainage pipes are very useful for growing plants with large and spreading root systems, especially those plants requiring some cover over winter. I have always used these pipes for this type of plant and had good results, so have now decided to try to see if Coprosmas would grow just as well, and am in the middle of tests to see how they accept the regime. The two advantages to me are, [a] they can be plunged over the summer in the gravel surround of the lawn, thus saving watering, and, [b] they can be lifted onto the Alpine Table or go into a frame over winter. The compost intended for use for the Coprosmas will be equal parts peat, grit and John Innes Potting mix.' Dennis will report later on the success or otherwise of their growth.

SOLLYA HETEROPHYLLA

by Jeff Irons

When the Plant Finder declares that a plant is 'widely available' the statement does not mean that at all. It signifies only that a significant number of the nurseries which send their catalogues to the Plant Finder list the plant. In the 1994-95 PF the number is 30, which is a very small part of the total number of nurseries and garden centres in Britain. Sollya heterophylla is described as widely available, and since it is quite common in gardens in the area where I live, I assumed that the pattern was general. The belief was destroyed in the summer of 1994 when, in a Channel 4 gardening programme the presenter expressed surprise at seeing Sollya heterophylla in a small garden.



So what is this plant, and what is special about it? Firstly it is not big but is a small evergreen sub-shrub ideal for small gardens and conservatories. Secondly it bears blue flowers over a long period in late summer and autumn. The species grows naturally in wandoo (Eucalyptus accedens) forest and woodland in Western Australia. The occurrence indicates that it should be suitable for Mediterranean areas, and that it is unlikely to be fully hardy in Britain. My own experience bears out that supposition. The Blue-bell creeper, to use the common name, is injured by air frosts of -5°C or below. My specimen has not experienced a really cold winter, but it has survived one in which the top few centimetres of ground froze. It is in a bed about 3.5m from the house. At Ness Gardens it is tucked into a warm corner, at the foot of high sandstone walls.

Sollya heterophylla can be either a shrub or a semi-climber with light twining stems. Planted in full sun it grows compactly, with dense foliage, to about 0.5-0.7m in height. In light shade or under cover it is more lax. As a twiner it can be allowed to grow on itself, or up pillars. The simple leaves, up to 5cm long are attractive all through the year. The intense gentian blue flowers appear over a long season, beginning between June and August (depending on site) and going on until late October, or even into November. They are dainty bells, no more than 1cm long, in long stemmed clusters. There are white and pink forms, but the blue one is the most showy.

While the plant is still flowering the fruits begin to ripen. As ornamental as the flowers, they are blue on the upper surface and hang for a long time, deepening in colour as they ripen. Sometimes these finger shaped fruits have a small point at their tips, sometimes not. When cut for flower arrangements the fruit sprays will last for several weeks.

The fruits are packed with sticky seeds. This is a good indication that Sollya is in the Pittosporaceae - a family which is notoriously difficult to grow from seed. I haven't tried to grow Sollya from seed, but my guess it that once washed free of 'pitch' fresh seed will germinate well, and that stored seed will need prolonged leaching. Cuttings root so easily at almost any time of year that they are the usual method of propagation.

Almost any soil is suitable, as long as it is lime free and well drained. Pruning is necessary only for size control and to remove frost damaged wood.

The name Sollya was given to honour RH Solly, an English botanist and anatomist who lived between 1758 and 1838.

* * * * *

INDOOR SUCCESS

by Tim Longville

In the last issue of the APS Newsletter, Tim wrote an article about Correa baeuerlenii. One of the questions he asked, concerned when flowering might be expected. In Tim's own words:

'No sooner had I finished my Note with Queries on Correa baeuerlenii, which included the question as to when this rare stranger might condescend to flower for me, than of course it flowered. It flowered in the window of a north-facing spare bedroom, kept I suppose at around 50 degrees. The flowers are certainly odd. I'm not sure that either the chef's hat comparison or the chewed apple core one is quite right. The whole effect is much flightier and flirtier and has a distinctly South Sea Islands hula skirt undertone. One of the more fascinating aspects of the flowers is their development. They start as little, flat, greeny-white waistcoat buttons. Slowly they expand to become something more like the rounded upholstery buttons on a buttonback Victorian library chair. And only then, after several weeks of cautious expansion, do they stretch out to their final chef's-hat-apple-core-hula-skirt stage.

'A 20cm high, first-year cutting of C. reflexa flowered at the same time in the same window and makes a very pretty plant for a shady windowsill, with its much more orthodoxly fuchsia-like pale green flowers, shiny dark leaves and upright growth, if you are nervous about risking it overwinter in the open.

'The following concerns the first flowering of a plant grown in a pot indoors. There is nothing rare about this one but my little success story may encourage those who are just beginning to grow Australasian plants from seed or who are understandably doubtful about undertaking plants which aren't very likely to survive outside. The plant concerned is Paraserianthes lophantha, previously Albizia lophantha. These were grown from seed in April 1991. The plant which has just flowered is in a large earthenware pot on the floor in a sunny bay-window. It is about 1.5m tall. The foliage and general habit of the plant always make it worth growing. But the fluffy, creamy (perhaps with the faintest hint of yellow?) bottlebrush-style flower heads are a real bonus, particularly in November, particularly on the Solway

Coast, as the winds have howled and the rains lashed down. This is a town-house fronting directly on to the street and more than one soaked and melancholy passer-by has come to a sudden - and distinctly cheered - halt at the bizarre but beautiful sight it makes.

'So the moral of my notes is : please be encouraged. Even if you have no greenhouse, you can still grow - and flower - plants like this, if you can give them a bit of suitable window space.'

* * * * *

AUSTRALASIAN PLANTS FROM SEED
Some Notes and Queries

by Desmond Meikle

Over the years I have received a miscellany of Australasian seeds from a variety of sources, but chiefly from a kind and patient friend who lives near Melbourne. Anything is acceptable, including several items which most gardeners would reject as not worth growing : Senecio linearifolius, for instance, which is in no respect more garden-worthy than our native Ragwort! But, to me, all are of interest. All are eventually planted outdoors; I do not keep a greenhouse collection.

Inevitably I have failures as well as successes, the former regrettably rather outnumbering the latter. Sometimes the seed may be to blame; sometimes the propagator, but am I wrong in imagining that many Australasian seeds are difficult to germinate? I sow them in standard seed compost, generally in mid or late spring, in a cold greenhouse (heated only in particularly severe winter weather), and I generally keep the seed containers, as advised by Brian Halliwell with New Zealand Ranunculi, for at least two years. Sometimes a few seedlings appear in the second year, but experience has made me something of a pessimist, and I rather tend to lose hope if nothing comes up in the first six months or so.

Certain questions spring to mind:
1. Are clay pots and seed pans to be preferred to plastic ones?
2. Is artificial heat necessary for satisfactory germination?
3. What is the most generally satisfactory seed compost?
4. What is the best time of year for sowing seeds of Australasian plants?

Some seeds seem to germinate very freely, and the seedlings develop quickly. Amongst these I would include Cassinia aculeata, C. arcuata, Callistemon spp, Callitris oblonga and C. rhomboidea, Parahebe derwentiana, Prostanthera lasianthos, Billardiera longiflora, Patersonia glauca, and most, but not all Acacia spp.

Incidentally, I find that the Tasmanian Callitris oblonga makes a charming, shapely, grey-blue bush, much more attractive than C. rhomboidea, and distinctly hardier.

Some seeds germinate freely enough, but, having produced a few true leaves, the seedlings suddenly stop growing, and pass into a protracted, but ultimately fatal, dormancy. Amongst such are, I find, Clematis aristata, Sambucus gaudichaudiana and Blandfordia nobilis. What is the reason?

A third category includes those which germinate freely and develop satisfactorily thereafter, but seem to loathe being pricked out or transplanted. Here I would list Stylidium graminifolium, Bedfordia arborescens, Indigofera australis and Gaultheria appressa. With all these, healthy seedlings, carefully transplanted into small pots, have either promptly departed this life, or (more depressing) fallen sick and slowly died. Stylidium is of particular interest in this respect for crowded seedlings, removed last year en bloc to a larger container, are healthy and growing vigorously, while out of a dozen seedlings, individually transplanted at the same time, only one has survived, and it looks chlorotic and obviously unhappy. Have other members had this experience, and what is the remedy?

Some random notes : a splendid specimen of Acacia pravissima, more than ten years old, grows in a bed on the north side of a high wall at the Old Rectory, Wootton Courtenay; it is now over 4.5m tall, and as much in width, and is covered with flowers each spring.

Astelia chathamica 'Silver Spear' thrives here (Somerset) on a dry ledge, despite the fact that it is said to grow on wet peaty ground in Chatham Island. This year it flowered, and to my surprise the female inflorescence produced a few orange, fleshy fruits, each enclosing what appears to be a good seed. A. chathamica (or A. nervosa var chathamica) is said to be dioecious, and there are no male plants in the vicinity.

Finally, let me recommend the Rock Lily, Arthropodium cirrhatum, for dry sunny banks whre little else will grow. It never seems to suffer, however long the drought, is reasonably hardy, and elegant in a modest way.

Many thanks to Desmond for being brave enough to tell us of his failures. Its news like this, as well as success stories, that gives us the information needed to help us all succeed.

TO ANSWER SOME OF DESMOND'S QUESTIONS, JEFF IRONS HAS PRODUCED THE FOLLOWING NOTES. THIS ISSUE'S PROPAGATION NOTES SHOULD ALSO HELP OVERCOME SOME OF THE MANY FAILURES WE ALL ENCOUNTER. IF ANYONE HAS A FOOLPROOF METHOD FOR GETTING CERTAIN SEED TO GERMINATE AND SUBSEQUENTLY GROWN ON, LET US KNOW.

JEFF IRONS NOTES

Firstly though while agreeing with Desmond's general comments about seedlings which die off - and this does not just happen to Australasian species - I disagree about Blandfordia nobilis and Clematis aristata.

In the 1970s and early 1980s before I owned a greenhouse, all my seeds were germinated outside. Seedlings spent their first winter in a cold frame, then went into the garden. In those years I grew Blandfordia nobilis to flowering size and had a letter about it (with photograph) published in the JRHS. I had 9 Clematis aristata seedlings which flowered in years 3 and 4, then died in a cold winter. Since all were male there was no British seed. At the present time I have 6 seedlings of an Ecuadorean clematis.

I wonder to what extent seedling death is caused by the wrong pH. Most seedling composts are insufficiently acid. Blandfordias (for example) like a pH of 5. The only one I have seen in the wild is B. cunninghamii. It grows on sand over sandstone in a summer rainfall area. The trick with Blandfordias is to get them growing vigorously in year one, with a high N feed and autumn warmth. They can then be kept cool and almost dry over winter.

Most of the Australian work on seed germination has been carried out in connection with land reclamation after open-cast mining. Consequently it has been mostly with warm climate species. However a large range of cool climate Eucalypts has been studied. Few of them germinate well at low temperatures. Nearly all of the work has used incubators at constant temperature. There appears to be very little on fluctuating regimes, or on diurnal temperature range. Exposure to light has received some study. A few species eg Thysanotus must have a mycorrhizal association.

My own experience has been that few Australian or New Zealand plants germinate well at low temperatures. I used to sow at the end of March. Now I sow between May and September, under glass, and do not bother about sun on the pots. After all even in Britain the temperature in the top inch of soil can reach 21°C in early February.

I am just as unhelpful about the controversy of clay pots versus plastic. Originally clay was the only cheap material. Now it is expensive and plastic is cheap. Plastic pots are easier to water too. The Tasmanian nurseryman Ken Gillanders believes that cuttings root more readily in clay pots than in plastic ones. My view is that if he used a more open, less water retentive mix, then plastic pots would perform as well. They are easier to keep clean too. I use clay only for large pots - because of its physical strength. Large plastic pots are not thick enough.

As to artificial heat being necessary. Some tropical plants have been found to have optimum germination temperatures as high as 39°C. Most plants germinate best at 20-30°C. I think that we can obtain such temperatures by solar irradiation alone. A list of species needing high temperatures for germination accompanies the Propagation Notes included in this issue.

WESTERN AUSTRALIAN JOTTINGS

By Jeff Layman

Has anyone in the UK successfully grown and flowered Anigozanthos manglesii from seed? I have germinated and grown dozens of these plants, but never seen a flower. Last year I found a flower bud on one, but the dreaded black fungus disease took delight in destroying the bud before the rest of the plant. Just about all the plants eventually succumb to this fungus. Perhaps an antifungal such as mancozeb might help, but I've used it in the past without success.

I've flowered A. preissii and A. flavidus (both yellow and red forms) without problem (in fact the latter is a bit too vigorous - its rhizomes spread and it clumps up all too readily). I've not had any success with A. viridis either. It germinates somewhat less readily

than the other "kangaroo paws" (excepting Macropidia fuliginosa, which I have never succeeded in germinating despite at least 6 attempts), and I have only ever kept it alive for 18 months.

I have tried keeping plants wet, dry, hot, cold, and all combinations throughout the winter, but without success. Is there a foolproof way to flower A. manglesii? The only time I have seen the species in flower in the UK was at the Liverpool Garden Festival in 1984. I think these plants were flown in from Australia, but I'm not sure.

There may be an answer. The Sturt Desert Pea (Swainsonia formosa syn Clianthus formosus) has proved to be difficult to flower even in Australia outside of its natural habitat (I've never succeeded in flowering that, either), but a recent article said that it could be grown pretty easily in a self-watering pot filled with very sandy soil, and only the reservoir beneath kept well watered. I may try it this year. So if that can be flowered, can the rest of the kangaroo paws?



Anigozanthos manglesii

For several years I tried to grow Thysanotus multiflorus. It germinated fairly well, but often just sat there and died, or grew for a couple of years and died. Last year, a 4-year old plant rewarded me with 2 flower heads. I don't know why! There are no signs of any buds so far this year, but it's a little early yet (end of February).

An 8-year old Dryandra formosa will be a superb sight again soon. The first bud is just opening. It first flowered after only 3 years from seed. Last year there were around 60 flower heads over a period of 3 months or so. This year I expect more. Yet a D. quercifolia I germinated and grew at the same time as the D. formosa died after 5 years without any sign of a flower.

Kennedya prostrata winds its way all over the conservatory (nearly all my plants are bedded out in a very sandy mix of pretty low mineral level), and flowers from early December to March. I've grown several Templetonia retusa, but never had a flower from these (the red spider mites really ruin these plants, but leave the K. prostrata more or less alone). Many of these papillionaceous plants seem to vary greatly in their likes and dislikes, and the ease in which they succumb to red spider mite.

So what is the secret about flowering these plants successfully? Is it just patience (if you can keep the plants alive, that is)? After 9 years from seed, my Eucalyptus macrocarpa will have a couple of flowers this year for the first time. E. preissiana and E. forrestiana flowered in 3 years, and continues to flower well despite heavy pruning to keep them in check. Guichenotia macrantha is very easy from seed, flowers within a couple of years, and is in flower from early December to at least the end of February. So it's not just the difficult plants I grow! Perhaps it's linked to soil fungi, but I would

have thought that the whole plant would have grown poorly rather than just fail to flower. Or is there any evidence that more than one fungus is involved, and the take-up of minerals essential to flowering (potassium?) is assisted by a different fungus from that, say, for nitrogen or phosphorus?

I guess, though, that if they were all easy we wouldn't have half the enjoyment that we do!

NAME CHANGES

Old Name	New Name
Hebe hulkeana	Heliohebe hulkeana - ssp hulkeana
	- ssp evestita
Hebe raoulii	Heliohebe raoulii - ssp raoulii
	- ssp maccaskillii
Hebe lavaudiana	Heliohebe lavaudiana
Hebe raoulii ssp pentasepala	Heliohebe pentasepala
----	Heliohebe acuta
Hebe x fairfieldii	Heliohebe x fairfieldii
Hebe hulkeana x raoulii 'Hagley Park'	Heliohebe 'Hagley Park'
Hebe hulkeana 'Averil'	Heliohebe hulkeana 'Averil"
Hebe hulkeana 'Lena'	Heliohebe hulkeana ssp evestita 'Lena'

The following name changes took place in 1991 (we've only just heard).
Helichrysum argyrophyllum is now Ozothamnus argyrophyllus.
Helichrysum coralloides is now Ozothamnus coralloides.
Helichrysum gunnii is now Ozothamnus gunnii.
Helichrysum microphyllum (Hook.f.) Benth. is now O. microphyllus.
Note: the 1994/95 Plant Finder H. microphyllum is (Willd.) Camessèdes.

Tristania conferta (Brush Box) will be listed as Lophostemon confertus in future issues of the Plant Finder.

Acaena anserinifolia is now A. nova-zealandiae.
Cotula reptans is now Leptinella reptans.
Dianella laevis is now Dianella longifolia var longifolia.
Hoheria sexstylosa is now H. populnea var. lanceolata.
Olearia nummulariifolia var. cymbifolia is now O. cymbifolia.
Ranunculus muelleri var. brevicaulis is now R. acrophilus.

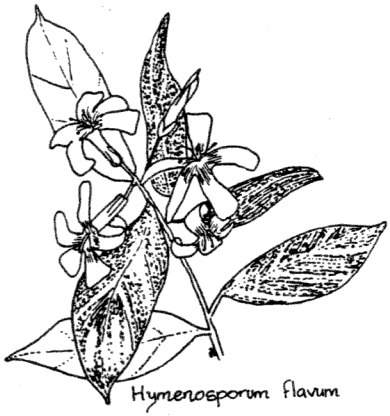
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WINTER 1994/5 IN ABERAERON

By Dr. Graham Sumner

I have just taken stock (early April) of damage/survivals following the recent very mild and very wet winter. In spite of the wetness (more than 430mm in December, January and February - about 45% of the normal annual total - and with only 11 days without rain during these months) Australasian plants seemed largely to prosper. Untypically for a wet and mild winter, there were no notable salt-laden gales, so that damage from that quarter was minimal.

There were even some very pleasant surprises in a winter when the lowest temperature only dipped to -2.5°C in early January, the first frost was on 21 December, and the last on 3 March : in total only 6 nights with frost. A large Acacia longifolia and a Pasaserianthes lophantha (formerly Albizia lophantha) in two large pots had become too big to return to the safety of the conservatory as usual in late November. The Acacia was planted in a vacant space near a wall 'to die', but thrived and has produced some very respectable wattle blossom since late January. Even more surprising was the survival of the Pasaserianthes in its pot, through the few frosts of December and early January, the first snowfall for 12 years early in March, and the frost which followed it. The task of shaking the wet snow from the branches of all evergreens in the garden after the snow was, however, a very drenching experience! Doubtless it will succomb next winter, but it is growing well, and has been in flower since mid-December, though its latest efforts have been a little half-hearted. Also in flower in the garden since mid-December has been a Melaleuca squamea. Its flowers are, in contrast, better now than during the winter. Amongst other garden plants, a Prostanthera cuneata has produced flowers since early February, and an Acacia riceana (very weakly) produced blossom in late February. Numerous Acacia melanoxylon (up to three years old) also survived the winter, though exposed leaves and phyllodes were badly browned by (?) salt-laden winds : no blossom here alas. Numerous Eucalyptus species are setting flowers very well at the moment, and various Eucryphia spp and a Dicksonia antarctica survived quite happily. Other plants which showed no winter damage were Bursaria spinosa, Cassinia spp, Ozothamnus spp, Olearia spp, Geranium traversii, Hebe hulkeana, Parahebe lyalli.



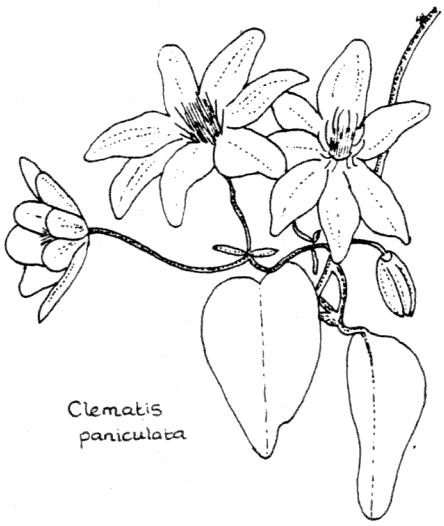
Indoors, specimens of Agonis flexuosa and Syzygium australe continued to show their resilience to extreme conditions. Having been outside for most of last year, both species adapted quite happily to much lower light levels and some central heating, though the Agonis began to defoliate after two months of relative darkness and heat, and had to be removed to the cooler, lighter (and crowded!) conservatory. All five Syzygium however flowered, and in many cases the flowers were somehow pollinated to produce the beautiful purple fruits. In the conservatory, Pittosporum undulatum produced their sweet blossom from mid-January, and Boronia metastigma flowered from mid-February. As I write, Hymenosporum flavum is coming into flower. Two Xanthorrhoea preissii and two Banksia blechnifolia died, I think, from over-watering.

It will be too much to hope for a similarly kind winter for 1995/96, but it is intriguing to note that milder, wetter winters (and warmer, drier summers) are predicted consequences of the enhanced greenhouse effect for southern Britain. Even then though, there will always be the unusually cold winter....!

* * * * *

A COUPLE OF CLIMBERS

In this year's seedlist you can find both Clematis paniculata and Clematis microphylla.



Clematis paniculata is found in the lowland forest margins of New Zealand. Maori forbears were so impressed by the showy flowering climber that they gave it the name Puawananga, meaning sacred flower. Starry, pure-white, fragrant flowers are produced in abundance. The male flowers, on separate vines are larger than the female. As the species produces no nectar, the female flowers must rely for pollination on pollen-collecting bees mistaking them for male flowers. After pollination, the female plants give rise to silvery seed plumes which subsequently get carried away on the breeze.

Clematis microphylla, the small leaved clematis, is a spring flowering plant found throughout temperate Australia and extending into southern Queensland. It is a slender climber with leaves divided into small narrow leaflets. Masses of creamy white flowers, star-like with four narrow lobes and many stamens are followed by attractive fluffy seedheads. Like many other Clematis it looks particularly good when allowed to grow through shrubs and trees.

BUSH FIRES

By Brian Halliwell

Bush fires are regular occurrences in Australian summers. They occur every year and whilst usually on a comparatively small scale, large ones can burn out of control over many square kilometres. They are not modern phenomena resulting from expansion of civilisation with its advanced technology for they occurred long before European settlement and even before the aborigines arrived centuries earlier. Whilst sone can be caused deliberately or accidentally, many occur from natural causes. These fires which can cause damage to property and crops also destroy natural vegetation : forest, scrub and grassland. It is a natural hazard in the same way as extremes of temperature and rainfall. Over aeons of time plants have adapted themselves to exist with it. In fact there would be no continuation of generations in some groups without fire.

The most obvious effect of fire is to remove competition by the destruction of trees, shrubs, perennials and grass. Following a fire all that may remain is a bare expanse of earth with a few charred skeletons of trees. After the next rains the scorched terrain begins

to change. The first plants to appear are annuals which now have maximum light and so grow, flower and seed, reproducing until once again competition from more permanent subjects becomes too great. Herbaceous plants which survived as underground storage organs grow away along with their seedlings and these will continue to grow and increase until they too succumb to competition. Terrestrial orchids appear in quantity in areas recently cleared of vegetation by forest fires.

The dominant trees in the Australian landscape are species of Eucalyptus. At the base of their trunks is a meristematic region, a lignotuber, which is a storage area for regeneration. Often noticeable as swellings near the cotyledons in seedlings, with age they grow together and soon become unnoticeable on developing trunks. On charred stumps are masses of dormant buds which following rain, will start into growth to produce large numbers of strong growing shoots. Eventually one of these will become dominant and grow away at the expense of the others which will decline and eventually abort. Although this type of regrowth is most noticeable with Eucalyptus it occurs in other genera within Myrtaceae as well as in some other Australian families eg Proteaceae. Within a period of 10 years when the rainfall pattern is normal, an area of forest razed by fire will once again be covered by trees.

Besides mature members of Myrtaceae being able to grow away again, completely new plants are coming in as seedlings and their appearance is a result of fire.

Species of many genera within this family have woody capsules which remain unchanged on the parent plant for many years. These will open only a few each year unless exposed to considerable heat as from a forest fire. Amongst the ashes these capsules open so that when the ground is cool it will be covered with seed and following rain, masses of seedlings. From Myrtaceae, in addition to Eucalyptus, some other genera of horticultural merit that have woody capsules are : Melaleuca, Leptospermum, Callistemon and Calothamnus whilst from Proteaceae are Banksia, Hakea and Dryandra.

The second most dominant tree group in the Australian flora is Acacia. Fire here is equally important in ensuring seedlings appear but for an entirely different reason. Seed coats of all Australian legumes are very hard and so seed can lie on the ground for years even decades, being unable to absorb water so that germination can occur. These seed coats need to be damaged before water can enter. If seed is part of the diet of animals or birds, body acids can thin the seed coats. Under suitable conditions, fungi and bacteria will attack the seed coats gradually weakening the testa; this can be a slow process. Charring of the seed coat resulting from a forest fire will cause sufficient damage to the seed coat to allow water to be absorbed and so legume seedlings appear in quantity after a bush fire. There is a number of species of Acacia which become forest trees and grow with Eucalyptus but they are shorter lived and less able to withstand competition. Mature forests tend to be one or a few species and usually these are in the genus Eucalyptus. Where rainfall is too low to support, scrub will result which can be rich in species.

Although a terrain can be completely denuded of vegetation by forest, it is quickly recolonised with one group of plants gradually replacing another.

There are some lessons that European gardeners can learn from what happens after an Australian bush fire. If a trunk of Eucalyptus is badly shaped, damaged or just unsatisfactory, cut down close to ground level. This will stimulate the ligno-tuber to produce a mass of shoots. The ultimate surviving dominant shoot will form a straight trunk.

If you want to raise new plants of bottlebrush from your own plant, collect capsules (always more than a year old), spread out on a tray and place in a hot oven for 15 minutes; quite soon capsules will open to release seed.

Wrap seeds of Australian legumes in twists of newspaper and ignite. When all the paper has burnt, sow seed and ashes in the normal way. It is probably easier to scatter seeds on an electric hot plate set at maximum heat or a metal dish over a gas ring for not more than a minute.

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GARDEN RECOMMENDATION

Ann Bracy, a Devon member, suggests that Coleton Fishacre Garden, Kingswear, Dartmouth, is well worth a visit if you're in the area. Currently managed by the National Trust, it has some old established Australasian plants such as a stand of Dicksonia antarctica as well as more recent plantings of a wide range of Australasian plants. The garden manager, David Mason, at one time lived in Australia.

SNIPPET - YEASTY

The mixture below is claimed to keep terrestrial orchids, Lechenaultias, Stylidiums and small herbaceous plants from Western Australia healthy.

1 teaspoon granular yeast
2 teaspoons sugar
½ cup hot water.

Shake together, stand till it begins to foam. Apply 3 teaspoonfuls to each plant when growth begins.

A similar yeast mixture is claimed to be beneficial to Verticordias. Treatments are repeated every 3 to 6 months.

APOLOGIES AND THANK YOU

Many thanks to all those members who sent in contributions and apologies to those who sent in several articles and find only one has been used in this issue. This is entirely due to the space needed for the lengthy, but excellent Propagation Notes and the Seedlist. Your articles will appear in future issues.

CONTACTS

Chairman	James Harris
Honorary Secretary	Jeff Irons 'Stonecourt' 74 Brimstage Road Heswall Wirral L60 1XQ Telephone 0151 342 1703
Treasurer	Dr. A. J. Entwistle 'Ophrys' 113 Station Road Delamere Cheshire CW8 2HZ Telephone 01606 882306
Newsletter Editor and Producer	Sue Hyams 'Applegarth' Knayton Thirsk North Yorkshire YO7 4AS Telephone 01845 537407

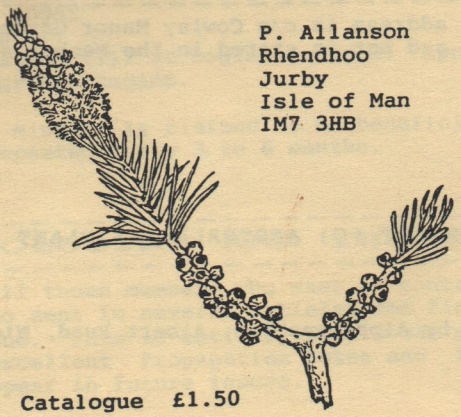
CHANGE OF ADDRESS

Noel Kingsbury's address is c/o Cowley Manor Gardens Project, Cowley, Gloucestershire, and not as stated in the Member's List.

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