PENTACHONDRA

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Fox-Rosehill Gardens in Falmouth

AUSTRALASIAN PLANT SOCIETY

Promoting the cultivation and conservation of Australasian plants, and their closest relatives, in northern hemisphere gardens

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APS NEWS

Events

Meon Orchard and County Park Nursery, Hampshire 10 am Sunday 19th May

Meon Orchard, home of APS members Dr and Mrs Doug Smith, is home to National Plant Collections of Eucalyptus, Araliaceae and Podocarpus & related Podocarpaceae. These give structure to the 1.5 acre plantsman's garden filled with architectural, exotic and rare plants. A recent addition is a 20 acre meadow with a half mile of river Meon frontage. You can find images of the garden on YouTube at www.youtube.com/watch?v=Oztqu5qPRUA.

County Park Nursery (now relocated to Blackmoor, just 5 minutes from the A3 in Hampshire,) is home to APS member Paul Boosey, grandson of Graham and Margaret Hutchins who started County Park in 1955 on a small patch of land in their backyard in Essex. Still mostly growing New Zealand and Australasian species, the range has been reduced whilst still retaining some of the plants that Graham sold. The main focus now is on structural and low maintenance shrubs suitable for the UK climate such as *Leptospermum* (manuka), *Callistemon* (bottlebrush), *Corokia* (wire-netting bush) and *Hoheria* (lacebark). There is more information at www.countyparknursery.co.uk.

The plan is to arrive at Meon Orchard (Kingsmead, Wickham, Hampshire, PO17 5AU) at approximately 10am where we will be met by Doug who will show us around the garden. Following lunch at the nearby Roebuck Inn we will travel on to County Park Nursery (Blackmoor House, Sotherington Road, just 5 minutes from the A3, GU33 6DA) where Paul will be waiting for us with tea, coffee and cake. County Park is at the top of the drive for the manor house, first left upon turning in. Paul will put out his bright orange sign so you can't miss it. Please note that there are no toilet facilities available.

If you wish to attend this event please contact events co-coordinator Gary Firth (contact details inside the back cover) so that we have an idea of numbers attending.

Foamlea and RHS Rosemoor, north Devon September or October, tbc

This two day event is planned to comprise a guided tour of RHS Rosemoor with curator (and APS member) Jonathan Webster, and a visit member Beth Smith's incredible cliff top garden, Foamlea, with its fantastic views of the Devon coastline. You can find out more about RHS Rosemoor from the article by Jonathan Hutchison on page 14, and on the RHS website (www.rhs.org.uk/gardens/rosemoor); and about Foamlea in Pentachondra issue 57 (November 2016, page 19) and at frustratedgardener.com /2015/06/03/gardening-on-the-edge-foamlea-north-devon/.

As an event like this takes some organising members were asked for expressions of interest in an email sent out in March. If you haven't replied yet, or didn't get the email, it's not too late to let events organiser Gary Firth (meetings@anzplantsoc.org.uk) know if you would be interested in attending, and if so. whether you have a preferred date: 8/9th September, 15/16th September or 25/26th October. An expression of interest does not commit you to attending. If you do not use email and are interested in attending

please contact Judy Clark (contact details inside the back cover).

Plant Heritage talk, West Sussex: The British and Irish Botanical Expedition Tasmania 2pm Saturday 26th October

Stephen Herrington, author of the article about the recent British and Irish botanical expedition to Tasmania on **page XX**, will be be speaking about his experiences at Haywards Heath Town Hall (40 Boltro Road, Haywards Heath, RH16 1BA). The talk will start at 2pm; the doors open at 1.30pm. You don't need to be a Plant Heritage member: APS members are most welcome but there will be a £4 entry charge.

Chester Zoo, Cheshire, 2020

A visit to Chester Zoo to to view the Plant Heritage National Collection of Nepenthes (pitcher plants), a genus that has its central point of diversity in South East Asia and New Guinea (part of Australasia) but extends down into Northern Queensland, was originally planned for earlier this year. However due to a devastating fire in part of the zoo in December 2018 this event has had to be postponed for 12 months.

Treasurers Report

The final surplus for the year was rather less than forecast at the AGM, mainly due to greater than expected costs for Pentachondra falling in the current year; in fact we only just broke even. The comparison with the previous year is of course distorted by the fact that our participation in the Hampton Court show yielded a considerable profit. However, our financial situation is still sound, with an average year's expenditure more than covered by subscription income. The costs of the seed list will need to be kept under review, with postage costs continuing to rise, particularly for sending to Europe, and the purchase of seeds being a significant item of expenditure. Members should bear in mind that access to the seed list is an important benefit of membership, and the more members who order seed, the more justified is this expenditure, and the efforts of Judy and Janet in administering the list.

Jeremy Spon

Do you grow grevilleas?

The APS is about to apply for a Plant Heritage Dispersed National Collection of *Grevillea*. We can then study ways of growing grevilleas, hardiness in different habitats, and availability of different species. Some members have already agreed to take part, but there's always room for more. It doesn't matter how many or how few plants you have; we'd still love to include you. All the information is recorded on Plant Heritage's dedicated database, Persephone, and I am happy to do the necessary work. All you need to do is send me some details of your plant(s) and I'll do the rest. To join in or for more information, please email Jude Lawton at conservation@anzplantsoc.org.uk.

Plant Choice Survey

APS Chairman Robbie Blackhall-Miles is currently undertaking a Masters by Research with the School of Anthropology and Conservation at the University of Kent. Overall, his research aims to discover:

- Why people grow plant material with known wild provenance (KWP)? What is their motivation?
- To what extent UK horticulture is directly reliant on KWP plant material?

Have you paid your subscription?

If you have not yet paid your 2019 subscription you will find a final reminder to do so enclosed with this newsletter. Please ignore it if you have paid very recently as you could have paid after the editor received the membership list.

- What benefits could, or does, commercial horticulture provide to provider countries and to what extent?

To help answer the first question Robbie is gathering data about the demand by gardeners for plants that have associated wild provenance data. You can assist by taking a short anonymous survey about the kind of choices you make when buying plants. The survey can be found at www.blackhalls.co.uk/choice-experiments/ and it is estimated that it will take about 8 minutes to complete.

He is particularly interested in consumers who visit specialist nurseries to buy plants, so as well as the APS he is contacting many other specialist plant societies. The research will also be mentioned in The Plantsman magazine. The more people who complete the survey the larger the sample and the better the data.

Robbie's research is supported financially by The Stanley Smith Horticultural Trust and The International Dendrology Society. The Royal Horticultural Society is providing technical support.

Contribute to Pentachondra

Many thanks to everyone who has provided material for this issue. Articles in Pentachondra are drawn from a variety of sources but members' contributions are what make our journal special. There is nothing like first hand experience when it comes to providing information about ways of growing Australasian plants, their hardiness in various parts of the UK and Europe, and what conditions they do and don't like. Maybe you could write something about the plants that you grow for the next issue? Or write something for members' news about your garden and what you've been up to? Or tell us about one of the gardens or nurseries that you will surely be visiting through out the year? Or a book that you have found useful?

In fact, you can write about anything that has some connection with Australasian plants and their allies. Contributions can be as long or as short as you like; anything from eight pages down to a sentence or two for Bits and Pieces or a picture with a caption. The deadline for the next issue is **31st October 2019**. If you have any questions about contributing please don't hesitate to contact Judy at editor@anzplantsoc.org.uk; she'll be delighted to hear from you.



MEMBERS' NEWS

Phemie Rose

We have moved from our country finca to an apartment in nearby L'Ampolla, Tarragona (Spain). I grew *Banksia serrata* from APS seed last year (2018) and it has moved with us in a pot. As a housewarming present friends gave us *Chamelaucium drummondii,* which was labelled 'The Plant'. I in fact lived in Geraldton (Western Australia) for a time, and I knew the Geraldton Wax (*Chamelaucium unciniatum*), a much taller and wider plant, but the flowers are similar. So now my gardening will

be confined to pots on the terrace, but growing from seed has always fascinated me and will continue to do so although I will have to consider height and spread more in my choices.

Michael Sullivan

I recently joined the APS and this is my introduction to you. Some 40 years ago I developed interest in alpines and the nearest nursery to me was County Park Nursery. As a complete beginner I was in awe of Graham Hutchins and his depth of knowledge and I can remember many conversations, or, dare I affectionately say, monologs. They were intense and stimulating.

My interest in alpines continues and I have regularly shown *Leptospermum*, *Coprosma*, *Correa* and a particularly fine *Ozothamnus selago* (see photo page 20) which eventually became too large and was planted in the garden. It was always kept in a saucer of water which had to be filled several times a day as it drank a minimum of 4 litres of water a day. As soon as the uptake slowed the saucer was emptied and I let it dry a little. The saucer had several half handfuls of Growmore during the year and it responded rapidly to that. Of all the plants I grow this was the most thirsty. This was a surprise and I thought it would not survive the amount of water I gave it but the response was a plant over a metre high and wide which was magnificent. After many red stickers it had to be retired due to its size.

Recently I have been doing well with dwarf *Leptospermum* and *Correa*. I am raising Leptospermum from seed and have around 100 seedlings yet to flower. The first year's seedlings were tip pruned regularly as an experiment and they have made very compact pot plants with the foliage very dense. This year I have noticed plants that have been packed close together suffer from dieback if there is not enough light, so that is under scrutiny. What is pleasing is that there is a huge variation in all the seedlings so I hope to have something to rival the varieties available in Australia. I also have some *Coprosma petriei* 'Violet Drops' seedlings which are big enough to fruit this year so I am excited at what is about to be revealed. I am still learning, experimenting, losing some plants and doing well with others, but that is why it is so rewarding.

If any member wants to visit please contact me (07949130649) and we can bounce ideas off each other.

George Smith

It's a year now since my wife (Cynthia) and I moved to a village in Wales near Wrexham. We have settled in well and feel part of the community

The garden I have taken over was a mess, mostly lawn and weeds. I cannot be doing with grass - too much work - so the first job in the front garden was to kill the grass and then dig it over and make borders and paths. I've planted a variety of callistemons, a large *Trachycarpus* that I bought from a superstore, and a grevillea and a correa, with perennial plants for colour.

The back garden is a useful size but again it was not maintained. It has a small pond which was overgrown but is now cleared and replanted, and at this time of year is full of frogspawn. One thing I needed was a glasshouse for tomatoes and raising seeds. With help from my son this was erected and functional by May 2018. I have had some success with APS seeds this year so watch this space.

I made a small border that I have planted with *Grevillea* 'Canberra Gem', *G. juniperina* subsp. *sulphurea*, *G.* x *semperflorens* and *G. victoria*e. There is lots more to be done. It will take time but we will get there and we would like to open the garden to visitors perhaps next year.



GET GROWING: NOTES ON THE 2019 SEEDLIST

Judy Clark

The 2019 seedlist includes new stock of some the most popular species as well many new items. Species where seed longevity is believed to be short, or where fresh seed does better, are ordered in smaller amounts. These species may run out but anything that proves that popular will be restocked in 2020, availability permitting.

Some new items have been added in response to requests from members and some have been chosen by Janet and myself. If something you've requested isn't on the list it will be because we have been unable to find a supplier this time round, but that doesn't mean that next year we won't be able to find one. Some species vary in how much seed they produce each year; others are more difficult to source because the seed is difficult to collect.

Blandfordia punicea

One species that was requested is *Blandfordia grandiflora* (Christmas bells). I couldn't get hold of it, but I was able to purchase seed of the closely-related *Blandfordia punicea* (Tasmanian Christmas bells); there is a photo of it on page 19. It's not a species I have grown, from seed or otherwise. The late Jeff Irons provided the following germination advice: "*Fresh seed gives some germination after one cold spell and more after a second cold spell. This can be achieved by sowing in spring. Give 4-6 weeks in a fridge, followed by 4 weeks in a greenhouse or outdoors. Remove germinated seedlings after 1 month and give the pot another 4 weeks in a fridge.*" I haven't found another source that suggests cold stratification; in contrast the ones I have found don't suggest any pre-treatment but there seems to be a consensus that seed of this species is slow to germinate.

Calothamnus

If you like bottlebrushes (*Callistemon*) then you'll probably like one-sided bottlebrushes, *Calothamnus*, also known as claw flowers. I have grown *Calothamnus validus* and *C. quadrifidus*. They are not terribly hardy but I they can do well in containers, and that way they can be given winter protection. I have found this genus very easy to germinate using the bog method (see box). If you are new to raising Australasian species from seed I do recommend starting with members of the Myrtaceae; if not *Calothamnus* then *Callistemon, Melaleuca*, *Leptospermum* or *Kunzea*.

The bog method for Myrtaceae

Sow the fine seed on the surface of a free-draining seed compost and gently water it in. Cover the seed with a thin layer of perlite or vermiculite; some sources suggest the one, some the other; I prefer perlite. Stand the pot in a shallow tray of water, keeping the water level topped up so that the seed-raising mix remains saturated. Keep pots in a warm place. In my experience germination occurs within weeks if the seed is viable.

Passiflora herbertiana

Seed of the climber *Passiflora herbertiana* (native passionfruit) was purchased because I couldn't get hold of seed of the more showy *Passiflora aurantia* (red passionfruit) to which I was introduced by Tim Darrington. He told me that red passionfruit is amazing for its rapid growth and the sheer number of flowers it produces, though where he lives (near Lyon) it has to be protected in winter. *P. herbertiana*, said to be similarly fast growing, hails from wet sclerophyll forest and rainforest margins in Queensland and New South Wales[1]. Ever hopeful, I do wonder if it might survive outside in very mild areas of the UK. This optimism stems from reading that it survives frost and fires by dying back to its roots, growing again when conditions permit[2]. (I wonder if *P. aurantia* does the same?)

Germinating *Passiflora herbertiana*

1. Place the seed in a container with warm water (around 25°C) and allow to soak for 24 hours.

2. Sow seed on surface of a porous seed raising mix. The seed will lodge in the the pores of the mix once watered.

3. Cover lightly with the seed raising mix. Do not bury the seed too deeply.

4. Water with a fine mist spray to avoid disturbance of the seed.

5. Place in a warm shaded or semi-shaded position to avoid drying out.

6. Keep warm and moist but avoid waterlogging the growing mix.

7. Germination should occur in 30-60 days at 25-30°C

(Instructions from the supplier, Australian Seed, (www.australianseed.com/).

Drosera

The genus *Drosera* (sundews) is new to the APS seedlist. They haven't been requested and I've never grown any from seed but we thought (hoped) that members who like carnivorous plants might like a chance to try some of the Australasian *Drosera* from seed. After all, although sundews are found all over the world, from Alaska to New Zealand, Australia is the centre of diversity. They grow in a variety of habitats[3]. Alpine sundew (*D. arcturi*) is confined to subalpine regions of south east Australia. *D. auriculata* is also native to south east Australia but grows in a wide variety of habitats and soil types. Forked sundew (*D. binata*) is a more widely distributed heathland species found in both Australia and New Zealand. *D. peltata* is even more widely distributed, being found from Asia to Tasmania, *D. stolonifera* is confined to Western Australia

Alpines

Drosera arcturi was sourced in response to requests for alpine and sub-alpine species, along with *Milligania densiflora* (Asteliaceae), the Tasmanian endemic *Orites revoluta* (Proteaceae), the daisies *Celmisia asteliifolia* and *Brachyscome spathulata* (Asteraceae), and the hemi-parasite *Euphrasia gibbsiae* (Orobanchaceae, formerly in the Scrophulariaceae). For more information about alpine and sub-alpine species you can do no better than Jamie Kirkpatrick's *Alpine Tasmania*[4].

Ericaceae

Also new to the 2019 seedlist are some Australasian ericaceous plants. These species used to have their own family, the Epacridaceae. They are now all included in the Ericaceae (in the subfamily Styphelioidae). I am told that members of the Ericaceae are not the easiest to germinate, something I hope

will be seen as a challenge rather than a deterrent. I have never myself grown any of these from seed, but fortunately APS chairman Robbie Blackhall-Miles does know what to do.

The first thing needed is suitable germination conditions. The APS does not recommend peat for reasons of sustainability but composted pine bark will do just as well. (Melcourt do a product for amateur growers.) Robbie suggests using a 50:50 combination of fine bark and sharp sand, but most importantly the growing medium should be inoculated with a small amount of soil in which another member of the Ericaceae is growing. The addition of this soil is to inoculate the sowing medium with the specific type of fungi that members of the Ericaceae need to survive; it doesn't have to be an Australasian species and could be from a blueberry or a *Gaultheria*. Surface sow the fine seed, water in gently, and keep the growing medium moist. The second thing needed is patience; be prepared to keep pots for months if not years as Ericaceae can be very slow to germinate and even slower to grow on.

Aciphylla

Despite one of their common names being speargrass[5] *Aciphylla* are not grasses but members of the carrot family, the Apiaciae. The name *Aciphylla* means needle leaf and both the leaves and the bracts surrounding the flower heads have spiny tips, often very spiny tips. All the species on the seedlist are from New Zealand, where the great majority of *Aciphylla* are found. They are very decorative plants, not resembling carrot at all; more like some agaves and yuccas with the advantage of being much hardier.

The supplier, New Zealand Tree Seeds (nzseeds.co.nz), offers the following advice about germination of *Aciphylla*: it germinates without pre treatment but 4 weeks cold stratification will help speed up and even out germination time. Jeff Irons' advice concurs with this approach. "*Cold stratification for at least three weeks usually results in erratic germination over several years.*"

The Seed Challenge

Siegfriedia darwinioides has been successfully germinated and grown by one member, and *Ricinocarpos pinifolius* has just germinated for another. (There will be a report in the December issue.) This means that *Siegfriedia* is no longer such a challenge and neither will *Ricinocarpos pinifolius* be if it is successfully grown on.

This should not stop anyone trying to grow either of these species, but it is time to add a new challenge. I wanted it to be *Exocarpos cupressiformis*, the subject of the article on page 25. As seed wasn't available, I had to settle for a close relative, *Exocarpos sparteus* (common names include broom ballart and slender cherry), which has smaller fruits and, guessing from its distribution, requires warmer conditions than *E. cupressiformis*. The challenge with *Exocarpos* is twofold: not only to germinate it but also to grow it on, as it's a hemi-parasite. For germination information I suggest starting with the website Seeds of South Australia[6]. For growing on one suggestion is to plant the seedlings with a native grass, such as *Themeda triandra*.

More information about germination

Two articles in this issue (pages 16 and 28) provide information about germination of members of the pea family including wattles. A wealth of information can be found in back issues; for example, the piece on the

2017 seedlist in issue 58 (May 2017) contains both general information and specific details for germinating particular genera such as *Banksia*. (Back issues of Pentachondra are available in the members area of the APS website.)

Tell us how you get on

Please let us know about your success or otherwise with seeds from the APS seedlist so that other members can learn from your experiences. The details of what methods you used to get the seed to germinate and how you raised the seedlings are both important. Everyone can contribute: there is so much more to find out about growing Australasian species in the northern hemisphere. Good luck, and please remember when you order your seeds that Janet is not superhuman, and at busy times she may not be able to deal with your order immediately.

Notes and sources

1. Elliot WR and Jones DL. (1997) *Encyclopaedia of Australian Plants* vol. 7. Melbourne: Lothian Books, pp 179-80

2. toowoombaplants2008.blogspot.com /2012/01/herberts-passionfruit.html

3. Elliot WR and Jones DL. (1984) *Encyclopaedia of Australian Plants* vol. 7. Melbourne: Lothian Books, pp 335-348.

4. Kirkpatrick JB. (1997) *Alpine Tasmania: an illustrated guide to the flora and vegetation*. Melbourne: Oxford University Press

5. Another common name is Spaniard - does anyone know why?

6. Seeds of South Australia: https://spapps.environment.sa.gov.au/SeedsOfSA/home.html. Click on 'Search' and then on 'Using Scientific Name". You only need to fill in the boxes for genus and specific name. Click on 'Search' and on the next page click on the species name. Scroll down to the bottom of the page to find germination information.

Can't get into the members area of the APS website? For a password contact Ben at webmaster@anzplantsoc.org.uk.

PHOSPHORUS TOXICITY AND AUSTRALIAN PLANTS

Robbie Blackhall-Miles and Ben Ram

The Australian flora has many iconic plants that are desirable for UK gardens, such as *Acacia*, *Anigozanthos*, *Banksia*, *Callistemon*, *Eucalyptus*, *Grevillea*, *Kennedia*, *Melaleuca* and *Swainsonia*. However, some of these have earned themselves a reputation for being difficult to cultivate well. Gardeners see them in flower, either in a nursery, garden or photograph and decide to give them a go. Some romp away with abandon, while others look miserable, or simply die for no apparent reason. This article attempts to resolve a major factor that affects their successful cultivation: phosphorus toxicity. The subject was briefly touched on in these pages by Schilling (1984) but our understanding has improved since then, as has the range and availability of Australian plants.

Phosphorus geology

One of the three major macronutrients used in horticulture, phosphorus is fed to plants to encourage root and stem growth. It allows plants to take up other important nutrients and regulates protein synthesis, thereby driving cell growth.

Most phosphorus is mined in Morocco, and on a global scale it is a rare element. It becomes available on the surface of the earth when volcanoes spew it out as dust, ash and molten





Phosphorus tolerance and Australian plants

Anigozanthus flavidus (above left) is tolerant of phosphorus but some in the genus are not. Species in the genus Kennedia, like *Kennedia nigricans* (left), have two methods of phosphorus uptake. *Grevillea victoriae* (above), like many in its genus, is sensitive to phosphorus. The experiment below shows *Grevillea aquifolium* in media with normal (right) and reduced (left) levels of phosphorus.











Anticlockwise from top left:

Phosphorus toxicity in a *Lomatia* seedling; phosphorus toxicity in *Telopea* leaves; *Protea* seedling with a healthy level of phosphorus; *Protea* seedling still looking healthy at one year old; cluster roots of a *Banksia* showing the typical close spacing of lateral rootlets.





rock. Erosion by natural processes such as glaciation frees minerals from the rocks, which are usually then distributed while suspended in water. Some of this phosphorus becomes locked up in their stems, bark and foliage. These eventually decompose to form the world's organic soils.

Australia is different. The rocks are some of the oldest on the planet. Any volcanoes that did exist are long extinct and glaciers have had little impact. Wind and water have eroded the mountains into islands that poke out of an otherwise flat and sandy landscape. Geologically, Australia has been asleep for a very long time.

In the east the Great Dividing Range acts as a barrier to moisture coming in from the sea, creating a humid and high-rainfall environment dominated by lush forests that stretch from the tropical north to the cooler, temperate south. These areas have managed to hang on to what phosphorus there is available through their organic soils.

The land to the west, however, is dry. What little rain has fallen has leached much of the phosphorus away. The sclerophyll vegetation here has evolved to acquire phosphorus and be economic with it. The nutrients required to build leaves are hard fought for, so plants hold on to and protect their leaves at all costs. When leaves do get old, their nutrients are returned to the plant before falling. With little rain any leaf litter that accumulates decomposes extremely slowly. Nutrients are used as quickly as they become available and only return to the soil in any quantity by means of fire. Regeneration after fires happens quickly and uses up the available phosphorus rapidly. It is the ability of plants to take up phosphorus in these environments that affects our ability to grow them, so an understanding of their ecology is useful.

Phosphorus strategies

Plants that grow in areas with very low phosphorus have developed several strategies for obtaining it. Some chemically mine it, by exuding acidic carboxylates at their root tips, breaking down rock to make phosphorus available in the soil. The thickened cluster roots of some *Proteaceae* and *Restionaceae* are thought to be an adaptation to this lifestyle. *Fabaceae*, however, can exude carboxylates from their normal root tips. The specialist root systems that the miners use have evolved separately in several plant families.

Others have evolved different strategies. Some *Ericaceae* use mycorrhizal fungi to scavenge phosphorus from a wide area, including from other plants, in exchange for carbon. Others have taken to a carnivorous diet, trapping insects and digesting them to obtain phosphorus. This has led to Western Australia having the highest diversity of *Drosera* species in the world.

In cultivation

Without close attention to these strategies for phosphorus acquisition gardeners can struggle to grow plants from these unique Australian environments. The scavengers and carnivores can generally cope with low to medium amounts of phosphorus in their growing medium without showing signs of stress. The miners, however, have little or no ability to regulate phosphorus uptake and thus suffer when more than minuscule amounts are readily available. When too much phosphorus is freely available they can overdose. This often manifests itself in leaves and stems that turn black and die, subsequently killing the plant.

It is worth noting that the strategy a plant uses to acquire phosphorus is not always simply a choice between one or the other. Some genera use a trade-off between mining and scavenging, depending on ease of availability. *Kennedia*, for example, can either use mycorrhizal fungi or carboxylate exudation, but not both at the same time. When phosphorus is available in the soil carboxylate release is suppressed, allowing mycorrhizae to colonize their roots.

Uptake of phosphorus

Phosphorus is a highly reactive element. It is this that makes it so useful to plants, by fuelling the chemical reactions for energy transfer. In air, phosphorus combines with oxygen to form phosphate. But for plants to uptake phosphorus it needs to be in solution with water. In soil, phosphorus is usually in an organic solid state and is not readily available without being decomposed and released into water in an inorganic state.

In areas with wet winters and dry summers plants take up phosphorus in winter and store it in their tissues, such as in their bark, until the weather gets warmer and growth restarts. It may not be until a plant starts to grow that you notice its tissue going black and dying. In cultivation, phosphorus-sensitive plants potted into a highly organic compost can suffer in the growing season. This is because too much phosphorus becomes available as the compost breaks down.

Which plants are sensitive?

If you have an Australian plant and are unsure about its sensitivity, start by finding out where it comes from in the wild and what family it is in. A good rule-of-thumb is that *Myrtaceae* can handle phosphorus whereas *Proteaceae*, *Restionaceae* and *Cyperaceae* cannot. However, some *Proteaceae* can handle higher levels and some *Myrtaceae* cannot. Western Australian species are generally more sensitive, yet rainforest species east of the Great Dividing Range are less so. *Fabaceae* and *Ericaceae* can be either way, but be aware that sudden changes in levels of available phosphorus can affect these families.

Some Australian plants come from areas with relatively normal phosphorus levels. These are easier to grow in gardens if you know which ones they are. *Grevillea robusta*, for example, handles phosphorus well since it is native to northeast Australian rainforest where phosphorus is available in the leaf litter. This allows it to be grown easily in the rich soils of UK gardens and makes it a useful candidate as a rootstock for the more phosphorus intolerant members of its genus.

Symptoms and remedies

Plant tissue that looks blackened, yellowing or burnt may be showing signs of phosphorus toxicity. Deterioration can be quick, but there are simple methods that can alleviate decline, although they are not guaranteed due to the speed at which toxicity can occur. Iron, aluminium and calcium react with and lock up phosphorus in soil at different pH levels.

Phosphorus is most available at a slightly acid to neutral pH (5.5–7). Most plants that are phosphorus-sensitive come from acidic soils, so at pH 5.5–7 addition of sulphur in the form of a metal sulphate solution is the best method of acidifying the soil. Once your soil is at pH 4–5 the addition of aluminium sulphate will best lock up available phosphorus. Below this pH, iron, as iron sulphate, better fixes phosphorus.

Iron, however, will bond with phosphorus to some extent at all acidic pH levels. Therefore, watering in iron sulphate as soon as symptoms occur is the best course of action. Prevention is better than cure and a regular dose of iron sulphate is recommended for all sensitive plants that grow in acid soils.

If your plant comes from an alkaline soil in the wild, a high pH can be achieved by adding calcium carbonate, which will also lock up phosphorus.

For all additions of metal sulphate and calcium carbonate, follow the dosage instructions on the packet.

Seeds

Seeds produced by plants in low-phosphorus soils do contain high levels of the element in their endosperm. This gives them the ability to grow quickly after germination. Once this supply is used up the seedlings need to access phosphorus from the soil, such as from ash after a fire. These plants have often evolved germination cues associated with fire, such as heat, or chemicals in smoke, or both. They are therefore used to having a comparatively high amount of phosphorus available at this stage of their growth. In cultivation this means it can be beneficial to provide phosphorus in the form of a weak solution of balanced liquid feed to seedlings just after the true leaves emerge. However, seedlings will often grow sufficiently well with a zero-phosphorus feed.

Growing media

The speed with which an organic compost breaks down dictates the rate at which phosphorus will become available. It is important that a growing medium contains some organic matter but this should have a high lignin content, such as bark, pine needles, coir or peat, that breaks down slowly.

The rest of the growing medium should consist of inorganic material such as sand, gravel, pumice or perlite. The choice and ratio of inorganic components in the growing media should reflect the water requirements of the plant.

Phosphorus-sensitive plants potted into growing medium with a low organic content still need other nutrients. These can be provided in the form of a low-phosphorus fertilizer. Examples of these include seaweed extract, sulphate of potash, sulphate of ammonia, dried blood (but not bone, which contains phosphorus) or a liquid or slow-release fertilizer with low phosphorus (usually sold as a feed for *Proteaceae*). Feed should be given as per label when plants are in active growth.

Conclusion

The plants of Australia seem very different from those we are used to in the northern hemisphere. They are certainly rewarding to grow for all levels of expertise. While some are relatively easy to cultivate, others do require some thought, but an understanding of their phosphorus requirements will mean that more of us can enjoy growing them well.

Reference

Schilling, T (1984) Proteaceae – a survey of the hardier species. *The Plantsman* 6(3): 129–151

About the authors

Robbie Blackhall-Miles and Ben Ram run a research nursery and botanical collection in North Wales. This article first appeared in *The Plantsman*, New Series Volume 16 Part 3 September 2017 pp 154-57. It is reproduced, with accompanying photos, with the kind permission of its editor and the authors. To subscribe to *The Plantsman* go to www.rhs.org.uk/about-the-rhs publications/magazines/the-plantsman.

ACACIA PARADOXA

Warren and Gloria Sheather

Acacia paradoxa is one of the 60 or so wattles that occur on the Northern Tablelands of NSW. It was previously known as *A. armata* and is commonly known as kangaroo thorn or hedge wattle. It is a spreading prickly shrub reaching a height of 3m with a similar spread. The 3cm long phyllodes are elliptical with wavy margins.

Accompanying the phyllodes, along the stems, is a barrage of stiff spines. Two spines are present at the base of each phyllode (see photo page 21). Bright yellow flowers are held in globular clusters. The flowers are held on peduncles that hold them above the spines. During spring each stem is covered by the bright yellow flowers. Outside of the flowering period *A. paradoxa* is a rather nondescript, prickly shrub. In spring plants glow and become an eye-catching, flowering shrub in bushland and gardens.

The species name is from the Greek *paradoxos* which means strange or contrary to expectations. This may refer to the 'Jekyll and Hyde' appearance of the species, depending on the season.

Once established, is has low water requirements and is frost tolerant. The kangaroo thorn is a useful hedge plant. Propagate from seed that should be soaked in boiling water before sowing.

A. paradoxa is widely distributed and is found in Queensland, NSW, Victoria, South Australia and, Western Australia and is naturalized in Tasmania. It was introduced into the United Kingdom in 1803. During the 17th century the species was featured in a number of botanical publications. At this time 'Fortified Wattle' (an apt name) and 'Bird-shaped Wattle' were two common names. Apparently, the latter name referred to the shape of the phyllodes.

About the authors

Warren and Gloria Sheather write for their local newspaper, submit items to the NSW Australian Plant Society website and write articles for the Acacia Study Group. For 20 years they have presented a talkback gardening program on the local ABC (the Australian BBC) radio network. This article first appeared in Acacia Study Group Newsletter December 2018 No. 143 p. 5.



WHAT'S GROWING AT ROSEMOOR

Jonathan Hutchinson

Due to the two particularly cold winters of 2008/9 and 2009/10 and the poor summer that came between them we lost a lot of plants at RHS Garden Rosemoor, many of which were southern hemisphere in origin. Although a rather depressing event, it did highlight the coldest areas of the garden where certain plants had succumbed, and the slightly warmer spots where they had survived.

Rosemoor Garden is situated in the Torridge Valley in Devon and sits on the north - south axis. The original area gifted to the RHS in 1998 is sheltered from the east by mixed mature woodland, whereas the garden areas, developed since the RHS took ownership, are more exposed and closer to the Torridge River at the valley bottom.

What one thinks of as a sheltered garden actually turns out to be a rather large frost pocket where cold air comes in off the surrounding hills and settles on the lower ground. One of these areas rather ironically happened to be what has been named the Exotic Garden, so what better place to put lots of nice tree

ferns along with other exciting plantings? The Croquet Lawn borders, which are dedicated to southern hemisphere plants, were particularly badly hit.

With other choice plants departing over that period, we certainly started to notice the survivors, such as a group of *Dicksonia antarctica* AGM that had been planted on what could be called a more exposed position, on the woodland banks. These did look a bit windswept, but had certainly survived. This led us to thinking how we could overcome this setback and try and find a solution to cultivating more of the less hardy species, so we turned our attention to a section of woodland even further up the bank above Rosemoor House.

An area of woodland that had a circular path around it seemed like an ideal proposition for this venture, so we duly set about making four areas about 20m x 20m (65 ft x 65 ft) along its length. These were marked as South America, South Africa, Australasia and New Zealand. Each area had a distance of about 20m x 20m (65'x65') between them which we envisaged would eventually be planted up so that all the areas would merge. Initially these spaces would be left untouched so as to provide shelter for the first plantings.

The area as a whole had tree cover throughout, which varied from mature English oak, beech, Scots pine, western red cedar and Douglas fir. From the outset we were very keen to keep as much of the cover as possible but were aware that we would need to remove a certain element of maturity if we were to stand any chance of establishing a range of trees and shrubs and provide for their light, moisture and nutrient needs. Prior to this we needed to spend time removing a whole mass of seedling beech and *Rhododendron ponticum* which produced a very effective barrier to any work that was due to be undertaken there. The terrain also varies greatly from a gentle slope at one end to areas that are particularly steep. Care has been needed when working on these spots, but though difficult to maintain, the plants themselves have grown very well. Of particular importance is the soil, or for some areas, the lack of it! Parts are very rocky, which along with sandier soils, enables excellent drainage. Soil in the main part of the garden is renowned for being very rich, with the parent soil being clay. This usually becomes saturated during our typically wet winters.

One of the main genera that we wanted to get back into the Garden was *Eucalyptus* which had been almost wiped out from the garden. The new areas being set out as they are lent themselves very well to getting some good stands of these planted within a mature stand of Scots pine. These slender tall canopies look rather well with the younger plantings which by their speed of growth will soon be rubbing shoulders with them. At five years old *Eucalyptus nitens* are already over 6m (20 ft) tall.

The Australian section is the steepest of the areas to be planted so care is taken while working there, though the plants have rooted into the free draining substrate very well. Initial growth was slow for some of the first plantings which consisted of a batch of seedlings of *Acacia dealbata* AGM and seedling groups of *Callistemon rigidus, C. salignus* AGM, and *C. subulatus*. However, since the reduction of the Douglas fir that frequent that area, growth has increased well. Other plantings mostly as singles or small

groups include: *Atherosperma moschatum*, *Athrotaxis cupressoides*, *Bursaria spinosa*, *Callitris oblonga*, *Cenarrhenes nitida*, *Eucalyptus gunii* subsp. *archeri*, *E. coccifera*, *E. parvula* AGM, *E. neglecta*, *E. nitens*, *E. pauciflora*, *E. pulverulenta*, *E. regnans*, *E. rubida*, *E. subcrenulata*, *E. urnigera*, *Lomatia fraseri, L. myricoides*, *Grevillea victoriae*, *Persoonia gunii*, *Phyllocladus aspleniifolius*, *Wollemia nobilis* and *Araucaria bidwillii*. *Araucaria bidwillii* is quite a recent planting. It has done remarkably well and can definitely be regarded as a survivor of the legendary 'beast from the east' of 2017-18.

It is lovely to have within the plantings some elements of Proteaceae, famed for their magnificent flower heads, even though our initial plants give a small visual display. *Telopea speciosissima* (photo page 20) has been purchased for planting and it will be interesting to see if it proves to be successful.

One ongoing problem, particularly in the woodland areas but also affecting garden areas, is fallow deer that cause considerable damage through their eating and rubbing habits. Some of the *Eucalyptus* got particularly damaged due to their being used as rubbing posts. This seems to have been prevented from recurring due to the use of wrap-around tree guards. Some of those plants with the worst damage were cut back down to ground level and have wasted little time in producing a wealth of regrowth. Many of the plantings are given a degree of protection from browsing by chicken wire fencing, although this does not prevent the deer from getting to the plants, it does seem to encourage them to find easier grazing.

To combat an element of the steepness of the bank, some basic terracing has been put into place using lengths of conifer trunk felled on site. This has delivered a much better and consistent working surface. It will be of huge benefit for the access and maintenance of the area but has not actually changed the character of the slope and its ability to shed the cold weather.

As these first plantings continue to develop, and start to provide their own shelter, further space will be provided for new plants in order to continue to develop elements of these wonderful southern hemisphere floras. Particular thanks go to Dan Luscombe, Collections Manager of Bedgebury National Pinetum and Forest and Martin Gardiner of the Conifer Conservation project at The Royal Botanic Garden Edinburgh for their donation of plants and seed, adding much to the plant diversity developing in these areas.

About the author

Jonathan Hutchinson is Team Leader at RHS Garden Rosemoor - Lady Anne's Garden. After finishing his studies at Royal Botanic Garden Edinburgh with a Diploma in Horticulture, he spent a year working at the Royal Botanic Garden in Sydney and its other gardens Mt Annan and Mount Tomah. This has given him a long lasting interest in the flora of the southern hemisphere.



BRITISH AND IRISH BOTANICAL EXPEDITION TASMANIA 2018

Stephen Herrington

On the 2nd January 2018 a group of organisations from horticultural/ botanical institutions working in partnership with each other left the UK and Ireland to embark on a plant

collecting expedition to Tasmania. Known as the British and Irish Botanical Expedition Tasmania 2018 (BIBET), the group consisted of: Stephen Herrington (Expedition Leader), Head Gardener, Nymans Garden, National Trust; Charlie Bancroft, Gardener, also from Nymans; Neil Porteous, Head of Gardens, Mount Stewart, National Trust (Northern Ireland); Piers Lunt, Horticulturist, The National Botanic Garden of Wales; Seamus O'Brien, Curator, National Botanic Gardens of Ireland; and Robert Wilson-Wright, Coolcarrigan House & Gardens. The BIBET team also carried out conservation work for the International Conifer Conservation Programme (ICCP), based at the Royal Botanic Garden Edinburgh (RBGE), which works to conserve and protect endangered conifers.

The expedition was in collaboration with the Royal Tasmanian Botanical Gardens and fieldwork carried out in a number of key locations around the Great Lake Conservation Area and Hartz Mountains National Park was a joint venture with James Wood, Seed Bank Coordinator, and Natalie Tapson, Horticultural Botanist.

The trip partly retraced the steps of an expedition carried out in 1929 -1930 by Harold Comber. Born in 1897 at National Trust Nymans in West Sussex, to James Comber, the first Head Gardener of the estate from 1895 to 1953, and his wife Ethel, Harold Comber grew up surrounded by the exotic trees and shrubs for which Nymans was famed, working at the garden for two years before moving to Colesbourne Park where he was made Superintendent of the botanical collections under glass. He then studied horticulture at Royal Botanic Gardens Edinburgh (RBGE), writing a thesis on rhododendrons, before being sponsored by a syndicate of well-known gardeners set up by Lord Aberconwy of Bodnant Gardens, organised by Sir Lionel de Rothschild and including Leonard Messel of Nymans. Comber was to be sent to South America on two separate expeditions in 1925-26 and 1926-27. He spent his time collecting in the Andean provinces of Argentina and Chile, areas specifically chosen for possessing conditions resembling those of Britain. Comber's introductions include *Sophora macrocarpa*, *Asteranthera ovata* and *Desfontainia spinosa* 'Harold Comber'.



Harold Comber

On his return to Scotland Comber completed his studies and then took the post of Head Gardener at Galloway House; while in this position he undertook another plant hunting expedition in 1929-30, this time to Tasmania. He collected some 147 plants, from a variety of locations around the island, and produced a small book on his return highlighting those species he considered especially worthy

of cultivation in the UK. Some of these highlights included *Nothofagus gunnii*, *Billardiera longiflora*, *Correa reflexa*, *Eucryphia lucida* and *Richea pandanifolia*. Later in his career he developed a passion for lily breeding and moved to the US to take up a position with the Oregon Bulb Farm. He died In Oregon in 1969.

Many of Comber's original collections have contributed to private collections now in public view in National Trust and botanic gardens across the country. His Tasmanian expedition was pioneering but many of the species he collected, being ephemeral. have been lost to cultivation; this trip has now reintroduced a number of those lost back into British and Irish horticulture. The BIBET expedition collected 252 accessions now distributed to participating institutes; many have been sown or are in storage awaiting appropriate conditions. Some of the focus of the expedition was to look at key collection sites visited by Comber, including Arthur-Pieman Harold Comber Conservation Area, Mount Field National Park, Mt Wellington, and the area around Queenstown.

The BIBET expedition started out from Hobart and moved around the island for three and a half weeks. En route we collected viable seed, herbarium material (sets now reside at Kew, Edinburgh and Glasnevin Botanic Gardens) and DNA of each collection (stored at the National Botanic Garden of Wales). All work carried out with the Royal Tasmanian Botanical Gardens was covered under their permits and any other collections came under our own permits presented by the Australian Government.

Conservation tasks were carried out on a number of key conifers in the genus *Athrotaxis* which are endangered or vulnerable as part of the ICCP. Collections were focused on areas relating to core conservation work being carried out in participating institutions; these include collecting from high altitude areas to ensure specimens were hardy in the UK and Ireland.

From Hobart the expedition team headed up to the Central Lake Plateau which was an area that Comber had collected in. We spent five days in this area covering a wide area and collecting various species including *Leptospermum rupestre* (photo opposite), both trailing and upright forms*; Bellendena montana*; *Pentachondra pumila*; *Leptorhynchos squamatus* var. *alpinus*; *Astelia alpina*; *Baloskion australe*; *Grevillea australis; Baekea gunniana*; *Hierochloe redolens*; and *Ozothamnus hookeri*.

The next part of the expedition took us west to the Central Highlands and The Walls of Jerusalem National Park where the group trekked across this beautiful but harsh landscape for three days. The main habitats for this area are alpine and scrubland with small stands of *Athrotaxis cupressoides* growing next to water. Other highlights in this area included *Melaleuca squamea* which grows in wet conditions and has small pink flowers, and swathes of the pincushion *Dracophyllum minimum*.

From here we travelled to Cradle Mountain, giving us a chance to make many important collections around the edge of the lake. We spotted for the first time the flower of *Blandfordia punicea* (photo opposite), a bulbous plant in the family Blandfordiaceae, and collected a herbarium sample of this species for future research.

We then moved across to the area around Queenstown and to the Mount







above left:
Blandfordia punicea

above right
Leptospermum rupestre

left:
Eucryphia lucida



Ski Hut on Twilight Tarn, on the left in 1929 and on the right 2018



above: **Michael Sullivan's prize *Ozothamnus selago***

below: ***Telopea speciossisima* growing in New South Wales - Jonathan Hutchinson hopes it will flower at Rosemoor**





***Cassia tomentella* seed germination – scarified seed on left.**



Kangaroo thorn (*Acacia paradoxa*) after the flowers have fallen, showing the two spines at the base of each phyllode.



Cherry ballart, *Exocarpos cupressiformis*

left:
The inside-our fruit, showing the stem (red) and seed (olive green)

below:
A full grown tree, showing its distinctive shape



Field National Park. In the National Park we hiked up to Tarn Shelf and an area called Twilight Tarn where Comber had collected plants in 1929. The images on page 19 show the Ski Hut in 1929 and our own photograph from 2018. It was inspirational to follow in the exact footsteps that Harold had taken 89 years earlier. In the National Park we also visited Russell Falls where large collections of *Dicksonia antarctica* could be seen growing next to the waterfalls with *Eucalyptus regnans*; these reached impressive heights of 4m with fronds up to 3m in length.



Slide image of Dicksonia antarctica at Russell Falls, taken in 1930

The next day the group headed down to the Tasman Peninsula which is about 100km from Hobart to the south east. The area is a long stretch of land jutting out to the sea connected to the mainland by a slither of land called the Eagle Neck. The day was spent driving along an off-road track called the Pirates Road recommended to us by James and Natalie as an area in which we might find interesting plants. We came across a number of key species in this area including *Billardia longifolia* climbing to a height of 2m and in full fruit, and *Eucalyptus globulus* reaching a height of 15m. We collected our 200th accession that day which was a *Pimelea sericea*, with collection notes as follows: '*on road to look out in full aspect, 1.5m tall medium size population, sandy soil, exposed site, Euc forest, 400m alt*.'

The final area the expedition covered was the Hartz Mountains National Park, situated in the south of the island, and the gateway to the southwest wilderness. The majority of the Park is over 600 metres and within its mountain ranges is Hartz Peak, the highest point at 1255 metres. As with much of Tasmania the underlying rock is dolerite which has been shaped through glaciation.

Comber made observations on the difficulty of traversing through the forest and one such plant he mentions is *Anodopetalum biglandulosum*, commonly known as horizontal scrub for its habit of growing vertically, falling over and then growing vertically again. In the early 19th century travellers would carry ropes to help those that fell through the matrix of *Anodopetalum,* sometimes falling metres below. Due to the level of forestry throughout the island tracks have made areas accessible that previously would have been difficult to reach. One of the major highlights of this area was seeing three species of *Eucryphia* growing in close proximity to each other: *E. lucida* (photo page 19), *E. milliganii* and the hybrid between the two, *E.* x *hybrida,* which was described by Comber.

The Tasmanian expedition yielded 254 seeds, herbarium specimens and DNA samples. These are now distributed across Britain and Ireland, and, alongside seeds received from the Royal Tasmanian Botanical Garden's seed bank they are now in the process of being germinated and grown in National Trust Nymans, Kilmacurragh, Coolcarrigan, National Trust Mount Stewart, and the National Botanic Gardens of Wales, Royal Botanic Gardens, Kew and RBGE.

About the author

Stephen Herrington, Head Gardener at Nyman's Gardens, is currently on secondment as National Trust Programme Lead, London and South East Gardens. The expedition was sponsored by the National Trust, the Royal Horticultural Society and Cotswold Outdoors.

Note

Longstanding APS members may remember, or even still possess, *Plant Hunting in Tasmania* by Harold Comber, published as a supplement to Pentachondra issue 22 (May 1999). I believe this supplement is a photocopy of an article by Comber entitled *Plant Collecting in Tasmania* and published in two parts in The New Flora and Silva 1930 (volume 3), edited by EHM Cox and published by Dulau and Co.

SCARIFYING SEED FOR GERMINATION SUCCESS

Glenn Leiper

Over recent years my propagation of some species from seed has been dismal, and I suspect I was slipping into some lazy habits. The problems were mainly occurring with pea species such as *Swainsona*, *Gompholobium*, *Pultenaea*, *Daviesia*, *Hovea*, *Sophora* and others. The seed quality was excellent, and sowing was done relatively quickly after collection, but results were usually mixed.

The technique I was using was pouring off-the-boil heated water onto the seeds and then letting them sit in this slow-cooling water overnight before sowing. (I'd check to see that the seed had swollen to make sure they were 'activated'). I'd been doing it for years and mostly getting decent or mixed results. The same technique was used for wattle seed with usually good results.

However, in the past few years the results have been poor to the point where sometimes I was getting no seed germinating. I discussed this with a few friends and I concluded that maybe I wasn't letting the boiling water sit long enough to cool slightly before pouring onto the seeds. It was in effect cooking the seeds. In other words, this old fella was getting impatient and rushing the process; or getting a bit blasé about the whole process more likely.

Anyway, during the discussions, one friend told me that he preferred to use sandpaper to scarify the smaller seeds and was getting excellent results after ditching the old boiling water technique. I was a bit reluctant at first but I shouldn't have been after experiencing such poor germination results for so long! I started using his technique and the results have been a huge improvement.

In short this is how it's done:

- Get hold of two sheets of sandpaper. I use 180 wood sandpaper because that's what I had in my shed, and it seems to work. But a friend said she read that other paper ratings of between 110 and 180 have been used for other exotic species.

- Sprinkle a small number of seeds, say a dozen, onto the sheet of sandpaper.
- Place a second sandpaper sheet over these seeds (sandy surface down) so in effect you have created a seed sandwich with the sheets of sandpaper as the slices of bread.
- Place your hand on the top sheet and move the top sheet back and forward over the seeds (and bottom sheet) in a rubbing motion for about 15 to 30 seconds, but don't press too hard. This will suitably roughen up the surface of the seeds, causing the hard external seed surface or seed coat to be thinned or broken through. (This will allow better water absorption.)
- Place the seeds in a small jar or container of water (not heated) and allow to soak overnight. This last step doesn't appear to be absolutely necessary as the seeds seem to absorb enough water once they're sown anyway.
- Sow the seeds in the usual way, covering them by the depth of mix similar to the seeds' width, then water them lightly with a spray bottle.

I've also been using a slightly different scarification technique for some larger hard seeds that look as though they need some help to initiate germination. Dry rainforest species such as *Cassia tomentella* (velvet cassia: photo page 21) have responded well to this technique. These species would rarely experience fire in their natural habitat, and if they did the plants would usually die from this extreme heat, so using heated water wouldn't seem like a recommended technique anyway to my way of thinking.

For these larger seeds I use a file. If the seeds are large enough, I hold them individually between my thumb and fore-finger and rub them firmly about 6 times on the fine-textured file until I can see the colour change on that abraded section of the seed where the inside of the seed has now been exposed. If the seed is a bit small and I know I'm going to file off my fingertips, then I hold the seed with a pair of pliers.

After filing the seed and exposing the inside of the seed itself, soak them in water or sow them immediately, whichever you prefer. If sown immediately, give it a good watering.

I'd be interested in hearing about other seed treatment techniques to trigger quicker germination. This scarification technique of course is nothing new, but one that I now prefer when sowing pea species especially.

About the author

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NATIVE CHERRIES ARE A BIT MYSTERIOUS, AND POSSIBLY INSIDE-OUT

Gregg Müller

People don't like parasites. But there's a local Aussie tree that's only a *little bit* parasitic: the native cherry, or cherry ballart. It's what we call *hemiparasitic*. It can photosynthesise, but gains extra nutrients by attaching its roots to host plants.

The native cherry, *Exocarpos cupressiformis*, might be our most

widespread root hemiparasite tree, but we're not quite sure – root-parasitic shrubs and trees are a bit of a research blank spot. We are not even really sure who all the hosts of cherry ballart are.

Although other parasites – like mistletoes – have a more direct Christmas association, cherry ballart does have an Australian Yuletide connection: their conifer-like appearance (the species name *cupressiformis* means "cypress-like") was noted by homesick European settlers, who chopped them down for Christmas trees.

On the map

Cherry ballart grows from the Atherton Tablelands in Queensland to southern Tasmania, and across to the Eyre Peninsula in South Australia.

The first European to record it was Jacques-Julien Houtou de Labillardière, the botanist on d'Entrecasteaux's expedition in search of La Perouse. He formally described the species in 1800, but we have no physical type specimen – the botanical type is his illustration and description. Maybe he lost his specimen, or disposed of it, or thought a picture would do; Jacques seems to have been a bit cavalier with his record-keeping. Or perhaps it was stolen or misplaced after all his specimens were seized in an overlapping series of defections, wars, defeats and revolution as the expedition tried to return to Europe. The collection was eventually returned after the intercession of English botanist Joseph Banks – but no cherry ballart.

Its distinctive shape (photo page 22) led to native cherry being marked on early Australian orienteering maps, since they are in a cartographic Goldilocks zone: obvious, just numerous enough to make them useful, but not so many as to clutter the map.

That was until Australia held the World Orienteering Championships in the mid-1980s, when the standardisation of Australian orienteering maps for overseas competitors led to the cherry ballart becoming an early victim of internationalisation – at least cartographically speaking.

Its utility also extended to the timber. Among the uses of its "close-grained and handsome wood" are tool handles, gun stocks and map rollers (although the last is probably a niche market these days).

Indigenous Australians ate the fruit, used the wood for spear throwers and reportedly used the sap as a treatment for snakebite. They called it Tchimmi-dillen (Queensland), Palatt or Ballot (Lake Condah, Victoria) and Ballee (Yarra).

Grow baby, grow!

Despite producing large quantities of fruit and seed, no one seems to be able to get native cherry to germinate reliably. There are anecdotal reports that feeding the seed to chooks works, but other growers dismiss this approach.

The edible fruit (photo page 22) isn't actually a true fruit: it's a swollen stem. It's reported to have the highest sugar level of any native fruit in the forests of southern Victoria and is much tastier than you'd think a stem would be. (It's also probably an important nutrient supply for some birds, but that's yet another thing we are yet to prove.)

This odd "fruit" gives rise to the genus name (*exo* = outside, *carpos* = fruit,) and was often touted by early European writers as another example of the topsy-turvy nature of Australia – "cherries"

with the pit on the outside went along with “duck-billed playtpus”, animals with pouches, trees that shed bark rather than leaves, and Christmas in the middle of summer.

Despite their oddness, native cherries in the bush are biodiversity hotspots. My camera trap data show they preferentially attract echidnas, possums, foxes, swamp wallabies, white-winged choughs and bronzewing pigeons.

This might be because they modify their immediate environment. My research shows they create moderate micro-climates in their foliage, reduce soil temperatures, increase soil water retention, concentrate nutrients in the soil beneath their canopies, and alter the understorey vegetation. They also kill some of their host trees, creating patches with higher concentrations of dead timber. All these probably have something to do with their animal attraction, but exactly how is a mystery yet to be solved.

In addition to their attractiveness to vertebrates, native cherries are required hosts for some striking moths and share specialist host duties with mistletoe for some of our most beautiful butterflies (although mistletoes take most of the glory in the scientific literature).

My research into our cherry ballart hopes in part to correct these historical slights. I want to set the record straight on this overlooked widespread and attractive little tree, which has a long indigenous use and was one of the first of our native flora to be described by Europeans.

About the author

Gregg Müller lectures in Natural History at LaTrobe University, Victoria, Australia.
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https://theconversation.com

AN HISTORIC GARDEN IN FALMOUTH

Jeremy Spon

Some members will be aware of the Facebook Group, Plant Identification UK, where members of the group can post pictures of plants growing in the UK for identification by other members. I am a member, and enjoy the challenge of trying to put a name to the plants posted; many are common and some crop up over and over again, as they self-seed in the gardens of people who are not very knowledgeable about plants. Occasionally however something more unusual turns up, and one post a year or so ago caught my eye because it featured two Australian plants which are very rare in cultivation, *Lambertia formosa* and *Triplarina imbricata*, formerly *Baeckea camphorata* (although there is still, as I write, an ongoing debate about the identity of the latter). The photos had been taken in the grounds of Falmouth University, and further enquiries revealed that these had originally formed part of one of the gardens created by the famous Fox family, also responsible for Penjerrick, Glendurgan and Trebah.

The garden in Falmouth, called Rosehill, is probably the least known of the Fox family's gardens, even though it was the first to be made, and their only surviving town garden. It is said to be the first ever garden in Cornwall to be planted in a 'Mediterranean' style, in the 1880s. The then owner, Howard Fox, seems to have been the first to plant an avenue of the dracaenas that are now such a feature of Cornish coastal towns. He was building on the work done by his uncle, Robert Were Fox, who is said to have planted over 300 tender foreign

plants as part of experiments to 'acclimatize' exotics.

In 1944 Howard Fox's daughters gave the lower part of Rosehill Gardens to Falmouth to be used as a public park; subsequently the house, and remaining upper gardens, were taken over by Falmouth School of Art, now part of Falmouth University. Both parts of the garden still contain many rare and unusual plants, some of great age, including two 'champion' trees, *Olearia paniculata* and *Leptospermum scoparium*[1], in the public park. And *Lambertia formosa* 'still grows there like weeds' according to gardener Kenny Bird.

The public park is now known as Fox Rosehill Gardens, and is run and maintained by contractors Cormac on behalf of Cornwall County Council; as well as the garden itself, which is open every day to the public, Cormac run a large nursery there supplying plants to gardens managed by them. Unfortunately, in recent years a number of plants have been lost to *Phytophthora* and in 2014 the Friends of Fox Rosehill Gardens were formed to help raise funds for replanting and raise the profile of this unique garden.

This group has now merged with the Friends of Falmouth Gardens and, together with recent funding from Cornwall County Council, Fox Rosehill is being regenerated with *Phytophthora* resistant plants, plus tree ferns, palms, banana plants, a new succulent border and herbaceous perennials, all chosen to restore the original 'essence' of the garden. The remains of the upper garden are maintained by Falmouth University's gardeners.

I have not had an opportunity to visit the gardens myself, but from what I have seen on the internet, and been told by those involved in looking after the garden, it is definitely worth visiting if you are in Falmouth. Details of how to find it are on Falmouth's official website.[2] If any member does do so, it would be interesting to have a first-hand report on what is currently growing there.

With special thanks to Jean Carr of the Friends of Falmouth Gardens for her help with this article, and for supplying the photograph on the front cover.

Notes

1. www.cornwallgardenstrust.org.uk/fox-rosehill-gardens/

2.www.falmouth.co.uk/see-and-do/parks/fox-rosehill-gardens/

THE GERMINATION OF ACACIA SEEDS – THE TECHNICAL SIDE

Tony Cavanagh

Have you ever wondered when you are pouring hot/boiling water over your *Acacia* seed to enhance germination, just what effect this treatment might be having on the seed? Many years ago and in another life, a friend, Dr. VN (Win) Tran and I asked this very question. As we were respectively an electrical engineer and a metallurgist/mechanical engineer, you may well wonder what possible interest this could have for us. It's a long story.

In the mid to late 1970s, the use of microwave energy to heat objects was in its infancy. There were no microwave ovens and there was considerable research being carried out. Knowing of my interest in native plants, Win asked me if there were any Australian plant seeds that we might

experiment on. I suggested *Acacia* and we moved on from there. In fact, we were the second people in the world to use microwave energy to improve *Acacia* germination, being pipped by a couple of months by researchers at the Weed Research Centre of the U.S. Department of Agriculture. In the end, while microwave energy worked and gave results similar to those achieved by dry heat and hot water, it did not offer any particular advantages over conventional practice and required experimentation to ensure that seeds were not overcooked. But what intrigued us most was that in all the papers we read on germination of acacias, no one had ever asked the question 'what does treatment do to the seed?'; that is, how does heat treating (the most popular method) work? It proved a fruitful and fascinating field of research and we published a number of joint papers and three substantial reviews, but much remains unknown and there are still quite a number of aspects of *Acacia* seed germination which are little understood even today.

I guess that few of us have ever examined an *Acacia* seed under a microscope or even with a x10 lens. Seeds are generally dark brown to black and range in size from a couple of millimetres (for example, *A. lateriticola*) to perhaps 20 mm in the northern *A. dunnii.* They generally have two flat sides on which is found a horse shoe-shaped groove known as the 'pleurogram' (figure 1). This is the first unknown – no one seems to know if this serves any purpose. At the top of the seed, is an area known as the 'hilum', often in a depression, which is the area where the seed was attached to its seed stalk or 'funicle (figure 2). The funicle is rarely seen on mature seed as it usually breaks off although some seeds have a large, fleshy, colourful swelling attached to the top of the seed known as an 'aril' (figure 3, page 31). The aril is rich in oils and fats and probably is a seed-dispersal mechanism. Ants (and possibly birds) collect such seeds and eat off the arils, with the ants storing the otherwise undamaged seeds in their nests. After a bushfire, 'clump' germination of wattles is sometimes seen from these buried seeds.

Figures 1 and 2

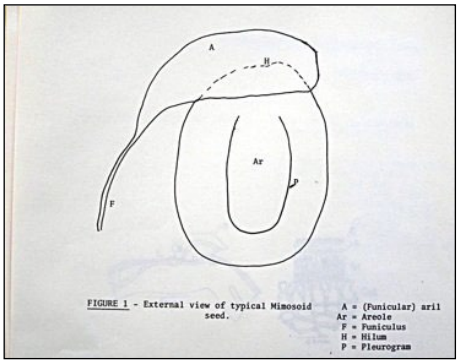


FIGURE 1 - External view of typical Mimosoid seed.

A = (Funicular) aril
Ar = Areole
F = Funiculus
H = Hilum
P = Pleurogram

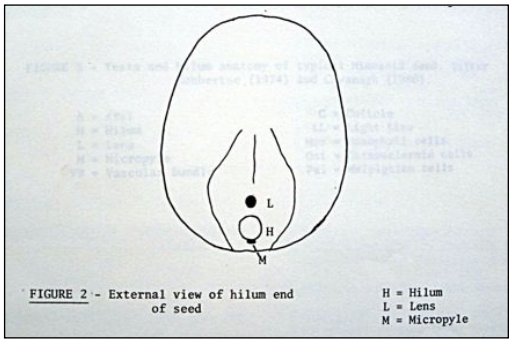


FIGURE 2 - External view of hilum end of seed

H = Hilum
L = Lens
M = Micropyle

The area of most interest is the hilum. Figure 4 shows the hilum area of *A. suaveolens*, seen under a scanning electron microscope at around 75 times magnification. Most but not all *Acacia* seeds show the features marked – the hilum **H** (as above), the 'micropyle' **M**

(the point where the pollen tube penetrated the ovule to fertilise it and begin the development of the seed), and the most important of all, the 'lens' **L** (sometimes mistakenly called the 'strophiole'). As its name implies, the lens is convex in shape and for many years, while its presence was noted by seed anatomists, its function was unknown. In our original work, we eventually tracked down some foreign-language papers (including one from South Africa in Afrikaans) which suggested that the lens could be a point of weakness in the seed coat. It ruptured under the stresses caused by hot water treatment or dry heat and thus allowed water entry to the seed and the germination process to begin. It wasn't hard to verify this. We treated a batch of 50 or so large seeds with boiling water (large seeds were chosen purely for ease of handling) and split them into two batches. One group received no further treatment, in the other we covered the whole of the hilum area with either Vaseline gel or Araldite glue, the purpose being to stop water access to the lens area. Both groups were germinated on moist filter paper in an incubator under controlled conditions. The results were astoundingly conclusive – almost no germination for those with the hilum/lens covered, over 90% for the uncovered group. So that was another mystery solved.

Most of us have heard the term 'hard seed' which is usually applied to legume seeds. It is used because most seeds of this group are 'mechanically' hard but it is also usually means they are water impermeable and require some form of treatment to damage the seed coat to allow water to penetrate and begin the germination process. Many commercial legume crops such as beans and peas, clovers etc have been bred so they no longer have a water impermeable seed coat but most wild legume seeds still do and must be treated. The technical term is that they are 'physically dormant'. We were interested in what feature(s) of the seed coat might be responsible.

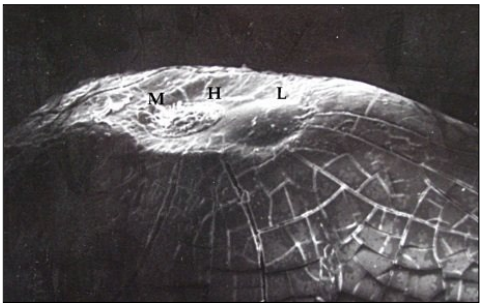


Figure 4: SEM of *A. suaveolens*

And it is indeed a remarkable water resistance. Acacia seeds have been soaked in seawater for more than 10 years and were still capable of germinating after treatment. Seed buried in the ground shows similar resistance. In a case in South Africa, an area was originally sown with *A. mearnsii* (black wattle) and cultivated for 16 years before the wattles were pulled out and the area was sown with maize. Maize was cultivated for 44 years and the area was then abandoned. Within a few years, wattle seedlings began to appear and within a decade the field was covered in *A. mearnsii*.

Even in large seeds, the actual thickness of the seed coat is quite small, perhaps as little as 10% of the seed thickness. In smaller seeds, it may be less than 50 microns (compare this with typical human hair which ranges between 50 and 120 microns). The coat structure is quite complex and although its general features were known to anatomists for over 100 years, even today there is no clear understanding of precisely what



The colourful arils of some *Acacia* seeds (figure 3)



Can anyone put a name to this grevillea?







Spring in the garden
Clockwise from top left:
***Prostanthera* 'Poorinda Petite**
Melaleuca cuticularis
orange flowered *Correa pulchella*
Melaleuca pustulata
Pandorea pandorana
Solanum linearifolium







causes water impermeability. I have always felt that such an understanding could have immense practical applications for water proofing compounds but I guess that no one will ever take it up. As figure 5 shows, the coat consists of several layers, the outer 'cuticle', thin, water permeable and structureless, is responsible for the glossy appearance of some seeds. The next layer is critical for water impermeability. Known as the macrosclereid layer, it consists of tightly packed, elongated cells which are impermeable through their entire length. What this means in theory is that you only need to damage the coat to below this layer (with a file, sandpaper or other abrasive technique) to effect germination. In practice of course, you have no idea how thick the layer might be but nicking or chipping seeds is a useful technique when you only have a few to treat. The layers below the macrosclereids are water permeable and play no part in preventing germination.

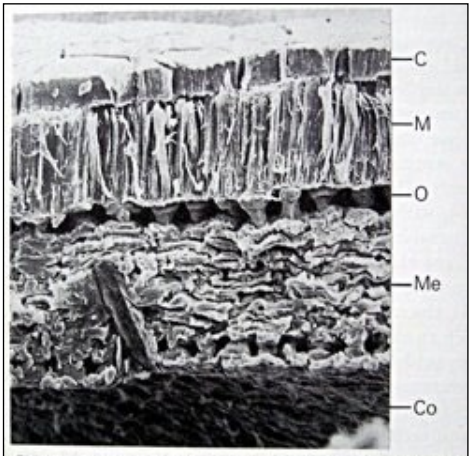


Fig. 6.1. Scanning electron micrograph of fractured seed coat of *Ac aneura*: C = cuticle, M = malpighian cells, O = osteoclereid c Me = mesophyll cells, Co = cotyledons. Magnification = times. (Photo courtesy Dr Peter Hanna of Deakin University CSIRO Division of Textile Industry, Belmont)

Figure 5: Cross section of seed coat

The effect of treatment on *Acacia* seeds

In the early days, one question that puzzled us is whether there might be a 'standard' method for germinating *Acacia* seeds – surely a "standard" technique existed which would give optimum results. Well, the answer is no, there is no such thing. Some species such as brigalow (*A. harpophylla*), *A. argyrodendron* and *A. cambagei*, require no treatment and unless stored in a refrigerator, brigalow seeds lose viability in less than a year.

Sometimes it is possible to sow immature, green seed (which requires no treatment) and achieve moderate germination. Some tropical *Acacia* seeds such as *A. aulacocarpa*, *A. holosericea* and *A. rothii* can show high susceptibility to fungal attack after hot water treatment and it is probably better to use nicking or chipping. Others are killed by boiling water but give good results with water at 80 to 90°C. (for example *A. suaveolens*, *A. sylvestris*). Seed of some species can be boiled for five to ten minutes with no ill effect and others can be heated in an oven at 100°C for 30 minutes or longer and still remain viable. Standard practice in the South African wattle industry where *A. mearnsii* is grown is to soak seed in 2 kg lots in water at 90°C for 30 to 60 seconds. What really brought home the uncertainty was a paper where the authors had collected seeds of *A. melanoxylon* from some 17 locations in Victoria and gave them all the same treatment of boiling for 30 seconds. Germination results ranged from 10% to 92%! It pays to be a little cautious and my recommendation is to use water off the boil and leave the seed soak overnight or for up to 24 hours. If you have a large quantity to process, do a few preliminary experiments beforehand to try to establish just how

much “off the boil” the water should be.

What does heating, dry or wet, do to the seed? Dry heat in particular causes a network of surface cracks and popular wisdom was that heating “cracked” the seed coat and allowed water penetration. Unfortunately for this theory, sections through treated seed showed that the cracks never penetrated the macrosclereid layer. Examination of treated seeds under both an optical microscope and a scanning electron microscope did reveal that the lens was damaged by heat, becoming raised and appearing white or golden, or in extreme cases became cracked and/or lifted off completely (figure 6).

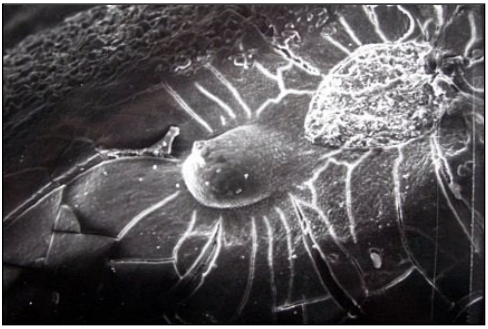


Figure 6: Cracked lens after treatment

The seed coat is much thinner at the lens than anywhere else so this small feature is a point of instability which ruptures under stress and allows water entry and enables germination. In the wild, *Acacia* seed can exist in the soil for decades, remaining viable and ungerminated, until an outside event such as disturbance or a bushfire can result in a flush of germination. The lens might thus be thought of as an ecological control valve which turns on germination in the right circumstances.

Well, that is the story from my point of view of a little understood process which is critical to us growing some of our favourite plants, the wattles. Unfortunately, it is not the whole story as there are still unknowns, not least of which is 'how do water impermeable seeds which do not have a lens germinate?' There are some non-acacias in this category and I have no idea of the answer. Perhaps someone in the future will look at the problem and come up with another mechanism.

About the author

Tony Cavanagh hails from Ocean Grove Victoria. This article first appeared in the ANPSA Acacia Study Group Newsletter of September 2010 (number 110, pages 6-9) and is reprinted by kind permission of the current editor Bill Aitcheson.



WITH SPRING IN MY STEP

Judy Clark

This time last year I was feeling devastated. Freezing weather in late February 2018 was followed in March (twice) by very strong east winds that came straight at my Hastings garden. All over the place once fine-looking plants were looking tattered and distraught, mirroring my feelings. I spent a lot of time cultivating vegetables on my allotment because I felt too disheartened to tackle the garden. In the event this turned out to be no bad thing. Had I tried to deal with the garden earlier I might have written off and pulled out some species that did eventually resprout, including *Eucalyptus leucoxylon*, *E. citriodora* (in a pot), *Pandorea pandorana* and *Syzygium australe*.

Spring 2019 could not be a greater contrast. After a very mild winter I find myself wandering round my garden with a joyful spring in my step,

relishing the profusion. The only winter weather that could be called really cold was a few days at the end of January. Ground frosts were few and snow came only once, a light coating that lay for half a day. The temperature in the back garden never went below -1ºC (and then only during the odd night) while in the front (where I don't measure the temperature) the survival of *Plectranthus argentatus* suggests that the temperature probably never fell below zero.

Autumn and winter flowering species which began to bloom in September, most notably correas and grevilleas, have flowered away merrily all winter. My diary tells me that *Grevillea* x *semperflorens*, *G. lanigera*, *G. victoriae*, *G. rosmarinifolia* x *lavandulacea*, *G.* 'Canberra Gem' and *G.* 'Poorinda Constance' were flowering on 22nd December. As I write at the end of April all except *G. victoriae* are still flowering, along with *G. iaspicula*, *G. juniperina* subsp. *sulphurea*, *G. rhyolitica*, two *G. rosmarinifolia* ('Jenkinsii' and one with pale lemon flowers), *G.* 'Clearview David' (I think it came correctly named) and a deep pink flowered plant that I haven't been able to put a name to (photo page 31). It looks close to *G.* 'Jenkinsii' but its flowers are mostly deep pinky-red and its leaves are wider and shorter. Its flower is hairy enough to suggest *G. lanigera* but it doesn't quite fit that taxon either.

Correas too have performed excellently. They also start in September, with the early flowering *Correa decumbens*. *C. aemula*, orange flowered *C. pulchella* (photo page 32) and green flowered *C. reflexa* var *reflexa* from Tasmania are still looking good at the end of April.

Wattles are another genus which starts early, beginning with *Acacia retinodes* which on 17th December I noticed had a few flowers. This is the first time that my plant, a rather glaucous leaved form, has flowered, and it's flowered intermittently ever since. Also just before Christmas, I noticed that buds on *Acacia dealbata* (I think subsp. *dealbata*) and *A. baileyana* had started to open. Soon after Christmas the purple leaved *A. baileyana* also began to flower. The buds on these feathery leaved acacias start to form in autumn but but none of mine have previously flowered before February at the earliest. *A. mucronata* (photo back cover), one of my favourites, is a later flowerer for me, but its creamy blooms last for weeks and it is just going over as I write. So is my yellow *A. myrtifolia*, making a splendid recovery for a plant that had looked completely dead in spring 2018.

A little gem of a mint bush which has proved hardier than I thought it would is *Prostanthera* 'Poorinda Petite'. (It came as this and I think that's what it is.) It is planted in the front garden and so was less affected by the weather of 2017-18 than plants at the back. It is going over now but it has been covered in blooms (photo page 32) since mid February. I've learned the hard way that mint bushes really do need pruning after flowering or they get very leggy. As I write the later flowering ones are still putting on a splendid display, with *P. rotundifolia* followed by *P. incisa* and then *P. ovalifolia* (plain and variegated).

I wrote in the May 2018 issue (number 60, page 36) about how *Hibbertia aspera* (rough guinea flower) was totally unaffected by the winter carnage, Well it just gets better as the plant gets bigger; it is absolutely smothered in bright yellow blooms as I write.

Another plant that over-wintered happily is *Solanum linearifolium* (mountain kangaroo apple, photo page 32). It is daintier than its cousin *S. laciniatum* and in my experience a little bit hardier. These Australian solanums are pioneer plants and tend to be short-lived in cultivation but are very easy to keep once you've got hold of a plant as fresh seed germinates like mustard and cress.

I have two specimens of *Pandorea pandorana*, the wonga wonga vine: who could resist growing a plant with such a name? I thought I'd lost them when I found both completely denuded of leaves following the visit of the beast from the east. This year both are doing splendidly. The buds start off creamy yellow but the flowers are just off white (photo page 32). It is found all over eastern Australia from Wilsons Promontory in Victoria to Cape York in Queensland, In the wild flower colour varies from white to yellow to bronze.

Eucalyptus leucoxylon is another I thought I'd lost as both plants were totally defoliated in March 2018. It resprouted not only at the base (from its lignotuber) but also on the branches (presumably from epicormic buds). I would guess this relates to an ability to recover after fire and/ or drought; if so it works equally well for cold. My container plant which overwintered in the potting shed has almost finished flowering and there are buds on the one planted out in the garden; I would expect this to flower in the summer.

Two container grown *Boronia heterophylla* (red boronia) plants are also flowering as I write, one with deep cerise blooms, the other almost white. They have a strong scent which I like very much. Brown boronia (*B. megastigma*) has a stronger scent but is less hardy.

I overwinter my plants under cover but having propagated the cerise form from cuttings, and having visited Cookscroft last year, I decided to experiment. I put a plant in my front garden last summer and the fortuitously mild winter meant that it has been able to establish. As I write it has not yet flowered but it has plenty of buds. It gets overhead protection from a couple of mint bushes, something which it may need during a harsher winter than the one just passed. The main thing I have to remember is to keep it well watered. If the soil dries out *B. heterophylla* start to wilt, and in my experience if that happens the plant does not recover. As with mint bushes, tip pruning prevents plants becoming leggy.

None of my bottlebrushes are flowering yet; the first to do so, around the end of May, is usually the pale yellow *Callistemon pallidus*. Blooming now are the closely related paperbarks and tea trees. In my garden the first to flower is the pinky lilac *Melaleuca squamea*, closely followed by pale yellow *M. pustulata*, and then ivory white *M. cuticularis* (photos page 32), with white *M. ericifolia* starting to bloom as I write. These are the hardiest melaleucas that I grow and I would recommend them all as easy going plants that will tolerate a range of conditions, though with a caveat: don't grow *M. ericifolia* unless you've a lot of room as it tends to sucker. I don't mind this as my plant is growing in a narrow gap between the potting shed and the back fence, where it suppresses weeds I find very difficult to get to.

There's much more to look forward to as spring turns to summer, and not just old favourites. I have come to see what happened last spring as an opportunity to revamp parts of my garden and I can't wait for my new specimens to bloom.

Illustration acknowledgements

BIBET Expedition: page 19
Robbie Blackhall-Miles: page 10
Tony Cavanagh: page 31 above
Judy Clark: back cover, page 31 below, page 32
Jonathan Hutchinson: page 20 below
Glenn Leiper: page 21 above
Michael Sullivan: page 20 above
RHS: page 9 above and below left
Tony Schilling: page 9 below right
Richard Stone: front cover
Wikimedia commons: https://commons.wikimedia.org/wiki/File:Acacia_paradoxa_leaves_in_summer.jpg: page 21 below
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The Australasian Plant Society

Minutes of the Annual General Meeting
Held at Lullingstone Castle, Eynsford, Kent on 10th November 2018

Committee Members Present:

Tom Hart Dyke - President
Robbie Blackhall-Miles - Chairman
Ben Ram - Webmaster
Judy Clark - Newsletter Editor
Jeremy Spon - Treasurer/Membership Secretary
Gary Firth and Maria Firth – Events Co-ordinators

Other members present:

Graham Blunt, Hannah Sindall, Mona Abboud, Dave Roberts, Mary Thomas, Mark Bennett, Bernard Fernandes, David Cooper, Dilys Renouf, Kevin Tooher, Adrian Cooper, David Renouf, Jeff Layman, Tony Gosden, Keith Larkin, Jude Lawton, Paul Boosey, Bob Stevens, Geoffrey Cooper, Beth Smith and Hilary Spon (taking minutes.)

1. Apologies for absence.

Apologies had been received from Janet Miller (Seed List Manager), Tim Darrington, Stephen Harding, John Warren, Paul Spracklin, David Tigwell, Doug Smith, Kevin Denson and Rosie Loveridge.

2. Introductions.

After a welcome from Tom, Robbie asked everyone present to explain briefly who they were and what their main interests were.

3. Minutes of Last Meeting.

These had been published in the May 2018 edition of Pentachondra, and were approved.

4. Election of Officers.

a) Tom Hart Dyke said he was willing to continue as President, and the meeting agreed unanimously that he should do so.

b) Committee. As all members of the committee were willing to continue in post, the meeting agreed to re-elect them en bloc.

5. Committee Reports.

a) Treasurer's Report (Jeremy Spon)

A provisional report (up to 2nd November) was circulated and although there were several significant items of expenditure expected before the end of the year, a surplus at the end of the year of around £500 of income over expenditure was projected. Membership stood at 183, a slight drop from last year; although a good number of new members joined during the year, quite a few of those who joined at Hampton Court in 2017 had not renewed.

b) Newsletter Editor's Report (Judy Clark)

Judy said that she was grateful to everyone who sent in articles, but would like more on what people grew in their own gardens as it interesting to see what grows well in different parts of the country. She pointed out that we need to start planning for the time when she could no longer edit Pentachondra; Jan Michalak had agreed to become involved as editor of content relating to New Zealand plants.

c) Seed List Manager's Report

Janet had provided a written report which was read out by Robbie. Just over 30 orders had been received, most in the days immediately after the seed-list went out with Pentachondra; there had been some delay in sending out the seed as Janet had a spell in hospital at this time. She pointed out that it now cost £2.65 to send seed to overseas members and asked whether it was time to increase the cost to them from the current £5. The Treasurer pointed out that as the income from the seed distribution was quite a bit less than the cost of buying and sending out seed, all members who ordered seed were being subsidised to a degree by other members, and it was agreed that this situation needed to be kept under review.

Judy reported that delays in sending out seed, and extra costs, were caused by orders being intercepted and checked by customs and plant health officials. This seemed to be a fairly random thing; spreading orders among more suppliers might reduce the risk of losses. Robbie said that new plant health legislation affecting seeds might well be introduced after the UK leaves the EU; he expected to find out more on a forthcoming visit to Kew.

Judy also suggested that the seed germination notes needed updating and simplifying; she had made a start on this, and would be circulating drafts for review next year. It was agreed that this was information that could best be provided on the website, where it could more easily be kept up to date.

d) Website Manager's Report (Ben Ram)

Ben said little had changed; the website was still going well, but he would always welcome new content. The idea of running a forum on the website was raised, but this

had already been considered and decided against. The Treasurer reported that currently the website was costing about £90 a year for hosting fees; there was an offer of free hosting which Ben would discuss further.

e) Lullingstone Library Catalogue. David Cooper was thanked for spending two (very cold) days in the library producing this catalogue, which was being made available on the website.

f) Social Media (Robbie Blackhall-Miles)

Robbie reported that we had 774 followers on Twitter, but he was unable to devote the amount of time he would like to the account. He reminded all members with Twitter accounts to tag the APS account whenever they tweeted about Australasian plants. The Facebook group had not been changed from closed to open, as this would diminish its value as a benefit of membership. Robbie encouraged members to join and post, even if it was only pictures. Consideration had been given to opening an Instagram account, but time pressures had prevented any progress being made on this.

g) Events (Gary Firth)

About 10 members had attended the visit to Cookscroft – a really good day and a fantastic garden. The visit to Geoffrey Cooper's arboretum was equally successful, with very positive feedback. The Cambridge Botanic Garden event was a great success. Kevin and Kathy Collins of Banksia Farm in Australia gave an exceptional talk completely free of charge, followed by lunch and then a tour of the garden. Robbie commented that we are attracting lots more gardens and institutions as members of the Society (although we are still in the throes of getting Cambridge Botanic to join).The stand at Great Dixter Plant Fair in October had been very successful – lots of interest from the large number of visitors, good plant sales and a number of new members had resulted. The APS had been invited to attend again in 2020.

Robbie also reported on the joint visit with the Mediterranean Plants and Gardens Society to the historic collections at the the Natural History Museum; it was a shame this could not be opened up to more members. Difficulties in communicating with Kew had prevented a formal event being held there, but Robbie and Ben had met up with a few other members for an informal gathering.

There was some discussion about events that the APS might attend to promote the Society in future years; it was agreed that more specialist plant fairs were best as many of the more general RHS shows seemed to be in decline, although the Specialist Societies Show at Wisley, which the APS had attended on a couple of occasions, was now much better organised. Gary would investigate whether it was too late to book a place at the RHS Malvern Show. If we do not attend any shows in 2019, we need to distribute membership leaflets to as many of the gardens as possible.

6. Matters Arising from Minutes of Last Years AGM

a) Social Media Officer. Robbie confirmed that he was still looking for someone to take over this responsibility as he does not have the time available that really needs to be given to it.

b) Conservation Officer. The Society had been given seed of Wollemia nobilis that could be distributed to members in various parts of the country to try growing, and a volunteer was needed to manage the information that would arise from this project. Jude Lawton agreed to talk to Robbie about this.

The idea of a Plant Heritage dispersed collection of Grevillea being held by members of the APS was raised, and Gary Firth, who already manages a dispersed collection of another genus agreed to work with members on this. The first step would be to ask members which Grevilleas they are currently growing.

7. Possible events in 2019

Several ideas were put forward:

- Tom suggested holding an Australasian Day at Lullingstone as there have been more members of APS and the Cacti Society visiting Lullingstone in 2018. 2020 is the 250th anniversary of Joseph Banks setting foot on mainland Australia so perhaps we should look to do something then.

- Mona suggested a visit to Paul Boosey's new nursery. Paul said the only problem was lack of toilet facilities. However, Doug Smith isn't too far from Paul's so perhaps we could visit both on the same day.

- A visit to Beth Smith's garden and Rosemoor in Devon (preferably in the autumn.)

- A visit to Abbotsbury.

- Some sort of event in Scotland.

- A visit to the National Botanic Garden of Wales.

There was some support for weekday rather than weekend visits.

Robbie felt there was a need in the future for a separate Visits Organiser for the north of England; in the meantime, it was agreed that Robbie would endeavour to organise a north of England event, perhaps a visit to Chester Zoo, and he would also try to get a talk organised for later in 2019. Robbie also suggested we try to have a lecture every year; it was agreed that this was a good idea, preferably in the autumn or winter, and possibly at a venue in the north.

8. Any Other Business

Society Structure – Statement of Purpose, Constitution and Rules

There was considerable discussion of the detailed wording of this document, and a number of changes were agreed to bring it up to date. Some other points were left to the committee to decide, and it was agreed that once these discussions were complete, a final revised version would be circulated to all members.

8) Conclusion

Tom was thanked for once again hosting the meeting and organising the food, and the meeting was then pronounced closed, after which Tom led a tour of the garden and greenhouses.9

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Narrow-leaf wattle, *Acacia mucronata*