PENTACHONDRA

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An avenue of *Eucalyptus glaucescens* in Buckinghamshire

AUSTRALASIAN PLANT SOCIETY

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

Number 73

December 2024

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Back cover, Edwards's botanical register, 1835,. v. 20 Plate 1703

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APS NEWS

From the Chairman

The society has enjoyed a busy season of events during 2024. We have attended plant sales at Borde Hill Gardens (twice), Leonardslee Gardens in Sussex and Hole Park (Kent) all as part of the Plant Fairs Roadshow and at Great Dixter.

Income from plant sales has varied (thanks partly to the variable weather this season) but more importantly it has given us a great opportunity to introduce members of the public to some great plants and to engage in conversation with them about how they can be grown in the UK. We are also really pleased to have recruited several new members to the society.

Many of the plants for sale were grown on from seed or cuttings by myself, Jeremy Spon and Judy Clark but in order to increase the range available and ensure we had sufficient plants for all events we also grew on a number of small liners purchased from a wholesale nursery. It has been very interesting to note what sells and what doesn't. Ferns (*Pteris*), bottlebrushes (*Callistemon*),



Gary Firth

The APS Stand at Great Dixter



Jeremy Spon

The APS Stand at Hole Park

mint bushes (*Prostanthera*), parahebes (scientifically now named *Veronica*), *Dendrobium* orchids, and various other genera in smaller numbers have sold well. Cordylines have been slow and phormiums have been a struggle. I guess the latter two have suffered from concerns over high losses over the last couple of winters plus widespread and not always appropriate overplanting in supermarket car parks!

With the knowledge and experience that we have gained this year we will hopefully be able to produce far more of our own material for sale in future years and rely much less on wholesalers. It would be great if more members were able to help by joining our small team of growers producing interesting Australasian plants for sale at future events. Please let us know if you would like to help.

We still remain concerned that with most of our committee members located in the south east corner of the country (and they are not getting any younger!) it is difficult to organise events further afield. As we have stated previously, we would love to hear from APS members from across the country who might like to organise events and plant sales in their area. The committee

can provide a lot of advice on this and look after most of the paperwork and correspondence with venues and members, but it can be difficult for us to guarantee to be able to physically attend events outside of the south east. We would also love to hear from any members who would like to join the committee. The work is not onerous and apart from the AGM much of the work of the society is conducted by email.

Speaking of AGMs, our next meeting will be held at Lullingstone Castle, Kent on Saturday 8th March by courtesy of Tom Hart Dyke. We would love to see you there. Further details can be found in the events section.

Gary Firth

New Members

The APS is delighted to welcome the following new members who joined during 2024: David Bedwell, Andrea Brogiato, Leo Salvia, Fred Harrison, Mike Parker, Simon Whitbourn, Belinda Bullen, Sian Piper, Jasper Appleby, Jemimah Baird, AR Kozlowski, Josep Vendrell, Seamus O'Donell, Pauline Withey, Sven Wair, and Andrea Foster.

Please introduce yourself to the leader at our events or anyone behind the stand at plant fairs. We would love to meet you and introduce you to others.

Correction

The winner of category 3 in the 2024 photo competition was Colin **Kitchener**. His winning image appeared on the back cover of the May 2024 issue of Pentachondra, credited to - Colin **Firth**. Thankfully Colin (Kitchener) was amused rather than angered by my error and I am pleased to have the opportunity to correct it here.

Events

APS AGM and visit to Lullingstone Castle Gardens

Saturday March 8th 10.30 for 11.am

We shall be returning to Lullingstone Castle for the 2025 AGM courtesy of our President, Tom Hart Dyke. A brief formal AGM will be followed by lunch after which Tom will take us on a tour of the gardens. Please bring plants to sell, to swap, to show or just to give away.

Lullingstone Castle is located just outside of Eynsford in Kent. The postcode for satnavs is DA4 0JA. From Eynsford follow the brown signs to Eagle Heights and Lullingstone Roman Villa along Lullingstone Lane. Continue past the Roman Villa for about 600m along the narrow private road to the Tudor Gatehouse entrance.

The nearest train station is Eynsford, and trains take approximately 50 minutes from central London. From Eynsford station to the Castle takes 10 to 15 minutes. After exiting the train station turn left, then left again at the main road and pass under the railway bridge. (Do not follow signs for Lullingstone Roman Villa or Eynsford.) On the right hand side of the road before you reach the Lullingstone gated entrance take the turning onto the signed green public footpath (opposite the recycling bank in the lay-by). Follow the rough track that brings you out at the Lullingstone Roman Villa. Turn left and follow Lullingstone's private road to the Gatehouse entrance. It may be possible to get a lift from Eynsford station; contact Judy Clark at **editor@anzplantsoc.org.uk**.

Plant Fairs

The APS will have a plant sales stand at the following Plant Fairs Roadshow events, selling a variety of interesting and rare plants of Australasian origin. If you are able to help on our stands please contact Gary and Maria Firth at **themyrtleman@gmail.com** or phone 07842 951602. Helping at plant fairs is great fun and you get to meet lots of fellow plant enthusiasts.

Borde Hill Gardens, Haywards Heath, West Sussex, RH16 1XP

Sunday 11th May 10am – 3pm

and Sunday 21st September 10am – 3pm

Listed by English Heritage as being of Grade II historic importance and set within 383 acres of an Area of Outstanding Natural Beauty on the High Weald, Borde Hill is of national botanical importance and features one of the largest collections of privately owned champion trees in the UK, with over 70 specimens. Many specimens are original material grown from seed brought back by some of the great plant hunters, including Kingdom Ward, Rock, Wilson and Forrest.

Hole Park Garden, Rolvenden, Cranbrook, Kent, TN17 4JA

Sunday 1st June, 11am – 4pm

This is one of the best-known gardens in Kent, a winner of Visit Kent's Garden of the Year award in 2016. Four generations of the Barham family have created a wonderful 16 acre garden in a magical parkland setting.

And more to come!

The details of other events in the 2025 programme are still being finalised. Members will be advised, with further details, as soon as dates are confirmed.

Denmans Gardens, near Arundel, West Sussex

Award-winning Denmans Garden is the former home and garden of the late John Brookes MBE, one of Britain's most influential landscape designers and garden design authors. It was converted in the 1940s from a market garden to an ornamental garden by plantswoman Joyce Robinson, who started the extensive gravel gardens in 1970. It features dry riverbeds, a walled garden, ponds, and a broad variety of unusual plants including from New Zealand.

Subscriptions are due!

Subscriptions are due on 1st January 2025. A renewal form is enclosed with this issue for those who do not automatically renew their membership. Annual subscriptions are £15 for members resident in the UK and £18 for members resident elsewhere.

If you pay by standing order or PayPal, or you have already paid for 2025, you do not need to do anything, unless any of your details have changed. If so, please contact Treasurer Jeremy Spon directly at **membership@anzplantsoc.org.uk**.

And if you are resident in the UK and would like to change your method of payment to annual bank transfer (see issue 69 for a reason to do so) our bank details are:

Bank: Natwest

Account Name: Australasian Plant Society

Sort Code: 60-19-24

Account Number: 29872677

Mona's Garden, north London

APS member Mona Abboud has kindly agreed to open her award winning garden to members during summer 2025. Situated in north London between Highgate and Muswell Hill, Mona's garden is home to many unusual Australasian and Mediterranean plants as well as the Plant Heritage National Collection™ of Corokia. Mona has written frequently about her garden and its plants in Pentachondra and there is more information at **https://monasgarden.co.uk/home/**.

Do you receive APS emails?

Does the APS have your email address? Have you received an email from us during the past six months? If the answers to these questions are 'yes' and 'no' respectively, please have a look in your spam box.

We ask because editor Judy Clark recently discovered an APS email in her spam box, even though she had previously received emails from this address. If this has happened to you could you please contact membership secretary Jeremy Spon at **membership@anzplantsoc.org.uk** so he can gauge how much of a problem this might be.

If you have not received emails from us in the last six months, and they are not hiding in your spam box, then this may be because we do not have your current email address. In this case, and assuming you do still wish to receive emails from us, then please also get in touch with Jeremy at the address above.

Please note that the APS is now using Mailchimp to send out emails to members, to improve security and conformity to GDPR regulations.

Other events

Other possibilities being explored include visits to APS member Martin Batchelor's nursery (**https://eleplantsnursery.com/**) and Wakehurst Place. We also hope to have a presence once again at the Great Dixter Autumn Plant Fair.

For further information about any of these events please contact Gary and Maria Firth at **themyrtleman@gmail.com** or phone 07842 951602.

APS Photography Competition 2024-25

Now that we have a date for the AGM we also have a deadline for the APS photography competition. For digital entries it is February 15th and for printed entries it is February 22nd. (The difference is to allow time for entries to be printed before the AGM on March 8th).

However you don't have to wait to send an entry. Photos can have been taken at any time, not just during the past year. Maybe the festive period will give you time to sort through your photographs, and if you can't find a shot that pleases you, well, there's plenty of time to take one. There are four categories: surely you can find something in your garden or greenhouse or conservatory that would fit into one of them.

The categories are:

1. Individual plant (whole or part) of Australasian origin growing in the northern hemisphere.

2. Close up of any plant of Australasian origin showing diagnostic features (for example, leaves or flowers), taken anywhere in the world.

3. Group of Australasian plants in a garden, anywhere in the world.

4. Australasian plants in a landscape in Australia or New Zealand (including islands that form part of the country).

Please send digital entries as jpeg files to **drmariafirth@icloud.com**, to arrive no later than February 15th 2025. Send prints (maximum size A5, nearest digital size 7 x 5) to Dr Maria Firth, 9 Harlands Close, Haywards Heath, RH16 1PS to arrive no later than February 22nd 2025. Or you can bring your print to the AGM.

For digital entries please include your name, entry category and photograph title in the name of your jpeg file. For printed entries write this information on the reverse side of the print.

Photographs will be displayed at the AGM without the title or name of the photographer. Attendees will be able vote for their favourite image in each category, and each winner will get a prize. Winning photos will be printed in the May 2025 issue of Pentachondra.

Finally, just a quick reminder of the rules.

1. Only photographs taken by current APS members and not used elsewhere will be accepted.

2. Entries are limited to two per member per category.

3. The competition is free to enter.

4. Members do not need to be present at the AGM to enter the competition.

Please note that while copyright of images will remain with the photographer the APS claims the right to exhibit the entries, and to use them to further its aims generally and to promote the APS and its photography competition. This includes publishing photos in APS publications, on the website, or on social media. All published photographs will be credited. The APS also claims the right to edit or use images in combination with others.

Writing for Pentachondra

As always, many thanks to all members who have contributed to this issue. Perhaps you will be one of those who makes a contribution to the May 2025 issue?

Last July I had an email from member Mark Bennett who is in the throes of making a new garden in the south west of England. He asked me if the APS had an "essentials" list of Australian plants "hardy" in the UK? A list that would help him cut down on the research needed to get a good range of Australian plants in his garden; 'backbone' Australian plants he called them.

Well, no: the APS has not produced such a list. But I do like the concept, and I for one would include mountain pepper (*Tasmannia lanceolata* synonym *Drimys lanceolata*) (see page 38)

I'm hoping members will have their own ideas. What plant from Australia or New Zealand would you include, and why would it be a must-have? Could you write about it, including details about the conditions in which it does well and your experience of growing it? I'd also like an indication of its hardiness. This could simply be where in the UK you know your plant survives and thrives. Or you could get a bit more technical and use the RHS hardiness ratings which are determined by the lowest temperature a plant is

likely to withstand (see **www.rhs.org.uk/advice/rhs-hardiness-rating**).

That said, as always contributions on any topic will be very welcome as long as there is some connection with Australasian plants and their close relatives. ('Australasia' includes Australia, New Zealand and neighbouring islands.) Length is not important, and if you don't fancy writing photographs on their own are fine but please include captions. If you are not confident about writing then the editor can help you put together an article using your material. If you have any questions please don't hesitate to contact Judy at **enquiries@anzplantsoc.org.uk**.

The deadline for the next issue is 31st March 2025. Please send contributions as word documents or similar (not as a PDF) and please do not compress photographs. It is easier for the editor and production editor if images and text are sent separately.

For sale

Eucaflip

This full colour photoguide is designed to enable the easy identification of 29 eucalypt species native to Tasmania. It was recommended by the late John Purse as the best guide for identifying eucalypts in the UK, as the species most commonly grown here hail from Tasmania. It illustrates the key diagnostic features - fruit, buds, bark and leaves - with life-size photographs. It is laminated and light enough to carry. When fully open it measures 92 by 48 cm but it folds up to 23 by 12 cm.

Australian Plants – A Guide to their Cultivation in Europe

We have a few copies left of this excellent book by Thomas Ross and Jeff Irons, one of the founders of the APS. It contains detailed information about selected Australian species that can be successfully cultivated in Europe along with a list of the characteristics and cultivation requirements of another 500 plants.

Contact **enquiries@anzplantsoc.org.uk** to purchase Eucaflip for £7.50 plus postage, or Ross and Irons for £10 plus postage.



Judy Clark

Tasmanian endemic *Athrotaxis x laxifolia*, (a hybrid between *Athrotaxis selaginoides* and *A. cupressoides*) in St. Helen's Park, Hastings

TASMANIAN ENDEMICS DISPERSED NATIONAL COLLECTION

Jude Lawton

The APS, as a member of Plant Heritage, is proposing a Dispersed National Collection (DNC) of Tasmanian plants, provisionally titled 'Tasmanian Endemics and their Cultivars'. In other words, the collection will include only plants that are found in Tasmania and nowhere else.

A DNC contains plants owned by several people, including private gardeners, nurseries, gardens and botanical institutions, rather than an individual Collection Holder. In our case, it enables us to conserve a much larger range of plants than is practical for one person. Tasmania has 535 endemics*, some of which are endangered or under threat. However, this does include plants of little or no interest to gardeners (weeds!) so we are not proposing to conserve them all. Below is a list of plants of possible interest to us. It is quite long and we will probably not be able to grow them all, but it is a useful starting point.



Judy Clark

***Asterotrichon discolor* with male flowers - a Tasmanian endemic**

For members of a DNC, there is very little work. You would need to keep a record of any plant you have, and keep us up to date with any changes. This can be quite informal: a text, email oR call is fine. The official documentation and record-keeping will all be done centrally.

Plant Heritage deals only with plants growing in the UK and Ireland, so members in other countries cannot be Collection Holders. However, you are welcome to join informally; you have valuable knowledge and experience which would be very welcome.

Please do have a look at the plant list here to see if you grow any of them. Even if you do not want to take part formally, you will have knowledge of your plants. Perhaps we can persuade you to provide propagation material too.

If you would like more information, please contact me at the email address inside the back cover. For more on the work of Plant Heritage and the National Plant Collections, go to **www.plantheritage.org.uk/national-plant-collections**.

* A Census of the Vascular Plants of Tasmania, including Macquarie Island, MF de Salas & ML Baker, 2024 edition (**https://flora.tmag.tas.gov.au/resources/census/**)

Some Tasmanian endemic species

This list was compiled by Judy Clark from various sources. There's bound to be an error or three, so please let her know if you feel there are any plants missing from this list that ought to be on it, or if a species has been wrongly identified as endemic.

Gymnosperms - Conifers

Athrotaxis cupressoides	Pencil pine
Athrotaxis selaginoides	King Billy pine
Athrotaxis x laxifolia	Hybrid pencil pine
Diselma archeri	Dwarf pine
Lagarostrobus franklinii	Huon pine
Microcachrys tetragona	Creeping pine
Phaerosphaera hookeriana	Drooping pine
Phyllocladus asplenifolius	Celery-top pine

Blandfordiaceae

Blandfordia punicea	Christmas bells

Asteliaceae

Milligania densiflora	Silky milligania



Gary Dunlop

***Athrotaxis selaginoides* cone**

Iridaceae - Iris family

Diplarrena latifolia	Western flag-iris

Ranunculaceae - Buttercup family

Clematis gentianoides	Ground clematis

Proteaceae

Agastachys odorata	White waratah
Bellendena montana	Mountain rocket
Cenarrhenes nitida	Native plum
Hakea epiglottis	Beaked needlebush
Lomatia polymorpha	Mountain guitar plant
Lomatia tinctoria	Guitar plant
Orites revolutus	Revolute orites
Orites acicularis	Yellow orites
Orites diversifolius	Variable orites
Orites milliganii	Toothed orites
Persoonia gunnii	Mountain geebung
Telopea truncata	Tasmanian waratah

Gunneraceae - Gunneras

Gunnera cordifolia	Tasmanian mudleaf



Judy Clark

Lomatia tinctoria

Fabaceae - Pea family

Acacia axillaris	Midlands wattle
Acacia derwentiana	Derwent wattle
Acacia pataczekii	Wally's wattle
Acacia riceana	Arching wattle
Hovea tasmanica	Rockfield purplepea

Rosaceae - Rose family

Acaena montana	Mountain buzzy

Nothofagaceae - Southern beeches

Nothofagus gunnii	Deciduous beech

Casuarinaceae - She-oaks

Allocasuarina crassa	Cape Pillar she-oak
Allocasuarina duncanii	Conical she-oak
Allocasuarina monilifera	Necklace she-oak
Allocasuarina zephyrea	Tasmanian she-oak

Cunoniaceae - Eucryphias

Eucryphia lucida	Leatherwood
Eucryphia milliganii	Dwarf leatherwood



Acacia pataczekii



Leptospermum nitidum

Judy Clark

Myrtaceae - Eucalypts, Tea-trees and Bottlebrushes

Eucalyptus amygdalina	Black peppermint
Eucalyptus archeri	Alpine cider gum
Eucalyptus barberi	Barber's gum
Eucalyptus coccifera	Snow peppermint
Eucalyptus cordata	Tasmanian silver gum
Eucalyptus delegatensis subsp. *tasmaniensis*	Gum-topped stringybark
Eucalyptus gunni	Cider gum
Eucalyptus johnstonii	Yellow gum
Eucalyptus morrisbyi	Morrisbys gum
Eucalyptus nitida	Western peppermint
Eucalyptus pulchella	White peppermint
Eucalyptus risdonii	Risdon peppermint
Eucalyptus rodwayi	Black swamp gum
Eucalyptus subcrenulata	Alpine yellow gum
Eucalyptus tenuiramis	Silver peppermint
Eucalyptus urnigera	Urn gum
Eucalyptus vernicosa	Varnished gum
Leptospermum glaucescens	Smoky tea-tree
Leptospermum grandiflorum	Autumn tea-tree
Leptospermum nitidum	Shiny tea-tree
Leptospermum riparium	River tea-tree
Melaleuca pustulata	Warty paperbark
Melaleuca virens (synonym *Callistemon viridiflorus*)	Prickly bottlebrush

Rutaceae - Citrus family

Acradenia frankliniae	Whitey wood
Boronia citriodora	Central lemon boronia

Malvaceae - Mallow family

Asterotrichon discolor	Tasmanian currajong

Ericaceae - Heather family

Archeria eriocarpa	Hairy rainforest-heath
Cyathodes straminea	Spreading cheeseberry
Epacris franklinii	Western river-heath
Epacris gunnii	Tall heath
Epacris serpyllifolia	Alpine heath
Gaultheria tasmanica	Tasmanian waxberry
Pentachondra ericifolia	Fine frilly-heath

Pentachondra involucrata	Forest frilly-heath
Richea acerosa	Slender candleheath
Richea alpina	Short candleheath
Richea x curtisiae	Hybrid candleheath
Richea dracophylla	Pineapple candleheath
Richea gunnii	Bog candleheath
Richea milliganii	Nodding candleheath
Richea pandanifolia	Pandani
Richea procera	Lax candleheath
Richea scoparia	Scoparia
Richea sprengelioides	Rigid candleheath
Trochocarpa cunninghamii	Straggling purpleberry
Trochocarpa disticha	Spreading purpleberry
Trochocarpa gunnii	Fragrant purpleberry
Trochocarpa thymifolia	Thyme-leafed purpleberry
Plantaginaceae - Speedwells	
Veronica formosa	Common speedwell bush
Lamiaceae - Mint family	
Westringia angustifolia	Narrowleaf westringia
Westringia brevifolia	Shortleaf westringia
Campanulaceae - Bellflower family	
Wahlenbergia saxicola	Mountain bluebell
Asteraceae - Daisy Family	
Abrotanella fosteroides	Tasmanian cushionplant
Abrotanella scapigera	Funnel snow-wort
Bedfordia linearis	Slender blanketleaf
Bedfordia salicina	Tasmanian blanketleaf
Brachyglottis brunonis	Tasmanian daisytree
Celmisia asteliifolia	Silver snowdaisy
Celmisia saxifraga	Small snowdaisy
Ewartia meredithiae	Rusty cushionherb
Ewartia planchonii	Creeping cushionherb
Helichrysum milliganii	Snow everlasting
Nablonium calyceroides (synonym *Ammobium calyceroides*)	Spiny everlasting
Odixia angusta	Thin ixodia
Olearia hookeri	Crimsontip daisybush
Olearia ledifolia	Rock daisybush
Olearia obcordata	Heartleaf daisybush
Ozothamnus antennaria	Sticky everlastingbush
Ozothamnus hookeri	Scaly everlastingbush

Ozothamnus ledifolius	Kerosene bush
Ozothamnus lycopodioides	Clubmoss everlastingbush
Ozothamnus purpurascens	Columnar everlastingbush
Ozothamnus reticulatus	Veined everlastingbush
Ozothamnus rodwayi	Alpine everlastingbush
Escalloniaceae	
Anopterus glandulosa	Tasmanian laurel
Pittosporaceae	
Billardiera longiflora	Purple appleberry



Judy Clark

***Nablonium calyceroides*, a small herb in the daisy family that has spines around the base of the inflorescence**



***Ozothamnus ledifolius*: the leaves of this evergreen shrub are highly inflammable, hence its common name of kerosene bush**

Please do not forget to tell us if your postal or email address changes - we do not want you to miss out on an edition of Pentachondra or Society emails!

NEWS FROM THE EAST

Martin Krüger

The signs of the garden year coming to an end are unmistakable. Leaves are colourful, some trees have already lost them completely, and morning fogs drown the valley which I overlook in a mysterious mood. Luckily for many of my plants frost has not yet bitten, and temperatures are still close to the twenties.

During the past years I have really come to love my little collection of plants from the other side of the globe, especially as some of them have grown into quite respectable specimens. And I have become more experienced as to what kind of soil or conditions they need, although, as with many living beings, they can be quite erratic sometimes too.

I have come to the conclusion that the biggest threat in our region here in the east of Germany is not the cold of winter, but the heat of the summer connected with a desert like dry sandy soil, which does not only not keep water, but also nutrients seem to flow through it. I have come to correct my opinion, that these Australian plants would love it here, because the climate and the drought seem so similar to their home country. I have the feeling that those regions in Australia where the plants I grow come from are certainly much more humid and fertile.

My first Australian love, *Hakea microcarpa*, has not yet disappointed me though. I bought it five years ago in France. It is now a bush of maybe 1.5m and has flowered in its second year. It has no complaints regardless of cold, heat, drought or sandy soil. *Hakea nodosa* seems to be a similarly easy going fellow. Its flowers are yellow and even seem to be of value for our bees.

A surprise for me is *Leptospermum rupestre*. I have created a little hedge, because I had so many plants grown from seeds. They lost all their leaves during the last winter, but have regained much of their former vigour and I use them now as a substitute for boxwood which has no future on the continent anymore because of the boxwood borer.

My childhood dream of growing a eucalyptus tree in the garden is nearly on the brink of being fulfilled,



Martin Krüger

Hakea microcarpa



Martin Krüger

Leptospermum rupestre

although even the hardiest of the Eucalyptus trees (as far as I know) - *Eucalyptus pauciflora* subsp. *debeuzevillei* - is in some winters freezing to the ground. In others it survives without any damage. The reasons lie beyond my understanding - at least beyond me being able to change something about it. A specimen close to the house has reached about 3m now, but who knows what happens next winter. If it freezes back it grows 2m again in one season.

A much smaller specimen of *E. subcrenulata* has survived winter without any complaints, but it is still so small that I could put a whole heap of leaves over it as a protection. *E. gunnii* has died several times, so no trying this one anymore.



Martin Krüger

Banksia ericifolia

I was also courageous with some grevilleas, like *Grevillea victoriae* and *G. australis*. Both of them are sufficiently hardy here, but don't grow much. The first even tried to flower, but the summer sun just dried the buds on the stem before they could even open. But like this they also keep their colour and for three months have looked as if they are just going to open.

I initially also had success with bringing *Verticordia plumosa* to germinate and grow, but unfortunately it died in the cold of winter in the heated greenhouse.

Lomatia silaifolia, *L. myricoides* and *L. fraseri* thrive in a shady spot, but don't gain much in volume or height. Their main growing time seems to be the colder and wetter season of autumn, but before they have grown substantially frost stops their ambitions.

I also tried banksias outside, but I was too optimistic. So they stay in pots now. They also grow during the summer and flower. But I become more and more worried about their height and weight - moving them in and out of the greenhouse every year is exhausting. I still grow *Banksia marginata*, *B. integrifolia* subsp. *monticola*, *B. occidentalis* and *B. ericifolia*. They are very easy plants.

I once received seeds from Judy Clark of an open pollinated *Grevillea lavandulacea* x *rosmarinifolia*. One specimen has survived (because it wasn't planted outside) and is now starting to grow flower buds. I am curious! (Editor's note: So am I!)

I was also hoping to get acacias to grow outside, but they don't like it here. *Acacia pataczekii* died during the winter as well as *A. dealbata*. Only *Acacia siculiformis* seems unimpressed by cold, heat or drought. It even flowers.

So generally my optimism about keeping Australian plants outside in



Martin Krüger

Banksia integrifolia



Martin Kriiger

Acacia pataczekii

the garden here has cooled down a bit, but the plants that do thrive create a wonderful atmosphere and I am always happy to get more insights into growing them!

Martin lives just outside Dresden in the far east of Germany, so undoubtedly a more continental climate than the UK!

GROWING GRASS TREES IN THE UK

John Lisle

I was not aware of grass trees as a young child growing up on the outskirts of Adelaide. Gum trees and wattles were everywhere but I can never remember seeing a grass tree. I know now they were there. My parents decided to return to England, so it was some twenty-five years later that I returned to Australia, in 1986.

My wife's brother emigrated to the Perth area in Western Australia. When we arrived at his house it was pitch black but the next morning was mind blowing. The house was set in natural bush, with gum trees, macrozamia cycads, and banksias to name but a few, and loads of grass trees looking like soldiers guarding the land. The intense sunlight shining through the translucent bright green leaves was a sight to behold.

These instantly become my favourite plant. They were everywhere. Most had blackened trunks from previous bush fires. They reminded me of the fibre optic lamps that were popular in the seventies.

This was before the days of the internet so finding information about Australian plants in UK libraries was very difficult. Kew Gardens had two beautiful *Xanthorrhoea australis* growing in the temperate house and they were there until the temperate house was renovated.

In the late nineties some imports of grass trees started to appear but they were very expensive, way out of my league. In 2004 I heard of someone selling them at a reasonable price. I ordered a 60cm trunk of *Xanthorrhoea glauca*. It had a very thick trunk and a



John Lisle

Xanthorrhoea glauca (size for planting out)

good head of emerging leaves. I decided to grow it in a pot so I could bring it into my conservatory for winter. The potting mix consisted of grit, sharp sand, compost and perlite. There was still very little information on how to care for them, apart from that they grow in very poor soil which is very low in phosphates. I was so pleased with this plant I bought another smaller one.

Next I wondered how they would grow from seed. The first seeds I tried were *Xanthorrhoea johnsonii*. These germinated very quickly with no special treatment. A lot were lost through damping off. The remaining seedlings were repotted in a very gritty mix, with a ring of grit around the stem to help avoid the damping off problem. When big enough some were potted up in chimney style terracotta pots. Other seeds were tried, mainly *X. glauca*, as I had read this was the fastest growing grass tree.

I have planted three *Xanthorrhoea johnsonii* in the front garden of my house just outside Bedford..These were grown from seed about 18 years ago and planted out a year ago. The winter was very wet with the lowest temperature -7°C, so I'm very pleased so far.

What I did realise was that the people selling these did not have much of a clue about how to look after them. I used to feed them with liquid seaweed and protea fertiliser. I now know any chemical fertiliser is not good as it is believed it will kill off the mycorrhizal fungi on the root system. Liquid seaweed is good and



John Lisle

Xanthorrhoea johnsonii



John Lisle

Xanthorrhoeas in pots

the best organic fertiliser I have found is Seafeed. This is a chicken manure mixed with seaweed and very low in phosphates.

I used to think growing in pots was the best way to go in the UK but I have changed my view on this after losing two beautiful specimens, the largest after 12 years and the smaller one after 14 years. This was a very bitter pill to swallow. The cause was probably *Phytophthora*, a fungal disease which causes the roots to rot. The problem with this is that by the time you notice it, it's normally game over and the plant can't be saved.

When grown in the ground I think grass trees are less susceptible to this as the very adventurous roots travel a long way in different directions, unlike in a pot where the roots will just circle the pot. Though it must be said when you see them in the wild there are nearly always some dead ones amongst the healthy ones.

The other reason for growing in the ground is that taking grass trees out of pots seems to set them free. When first planted in the ground they seem to sit still for a couple of years but once the roots go down you can have quite a sizeable plant in quite a short time.

This is why it is essential to get the drainage right when planting out small plants, so they won't be sitting in water. The best way to achieve this is to dig a much larger hole than is needed, then fill it with horticultural grit and gravel and add a layer of gritty compost. Be sure to dust the roots with mycorrhizal fungi. Cover the roots with more gritty compost, after which the area next the stem is filled with horticultural grit as this will help prevent rotting.

When the plant starts to grow the growing point will be pulled down into the soil by the roots. This is how very small plants can survive bush fires and of course in the UK frosts. A temporary roof over the plant will also help in winter to stop water from getting into the crown. Even as small plants they look very impressive.

I remember going to Kew Gardens when the temperate house reopened after the extensive renovation. They had two very large *Xanthorrhoea* specimens but a year later they were gone. When I enquired of one of the gardeners I was told both had died, which did make me think that if they have trouble what hope have I got.

The seed grown ones do not have this issue as they are not dug up from the wild. I hope our members will be encouraged to try these fantastic iconic Australian plants from seed.

PS I also grow the Tasmanian endemic species *Richea dracophylla*. The photo shows one of two that were dug up from my old house in Luton. They seem to have settled in well with only a slight bit of dieback. I also have some very small seedlings grown from seed from the flowers of these plants.



Richea dracophylla, from wet forests in the south east of Tasmania

John Lisle

PRE-GERMINATING SEEDS

Alan Bryan

My last edition of Pentachondra came with a very handy leaflet on seed sowing. However there is one seed technique not mentioned. This is pre-germination (or chitting) of seeds prior to sowing.

Prior to my experiments with pre-germination, my habit was to distribute seeds of each species in individual pots and either prick out or thin the seedlings so that I ended up with one seedling per pot. As I don't want industrial quantities of each variety this gives me sufficient plants. However it's not very efficient as you often end up with pots that are empty of seedlings, or if germination is sporadic, the first germinated seedling dominates the pot.

For some species, especially those that are in short supply, or have erratic germination, I now sow using the pre-germination technique.

For example, this year my banksia seeds were soaked in smoke water for 24 hours and then transferred to plastic boxes lined with wet kitchen paper, covered with clingfilm, and then placed on a north-facing windowsill until germination was observed. As soon as roots were observed the seeds were individually planted into pots of peat and grit and moved to a propagator in the greenhouse until the cotyledons were fully expanded. Any seeds that went mouldy were removed immediately and discarded. This technique works well as long as you have a steady hand and are very careful to water in the seed when you plant it rather than try and press soil around it. It is important to transfer the seed to pots the moment you see the root emerge from the seed, as once it grows the developing root can become entangled with the wet paper and is much more easily damaged.

I also used this method to germinate seeds of *Myosotidium hortensia* (Chatham Island forget-me-not) which require cold stratification to germinate. Seed was soaked in water for 24 hours and then transferred to a container with wet tissue and placed in a domestic refrigerator, enclosed in a zip-lock bag. Seeds were inspected weekly and germinating seeds removed and planted out in individual pots. Seeds began germinating after about 9 or 10 weeks, and germinated sporadically afterwards, giving 3 seedlings from 5 seeds.

Of course this method is easiest to use with large seeds. However it can also be done with small seeds, when a small paintbrush or a cocktail stick can be used to carefully transfer the germinated seeds. Try it next time you have some precious seed!



Alan Bryan

***Myosotidium hortensia* seed germination after 12 weeks in a domestic refrigerator**

HOW LONG DO SEEDS LAST IN STORAGE

Judy Clark

From feedback from members over the years we know that the seed you get from the APS doesn't always germinate. There are various reasons as to why this might be and in this article I explore one of them; the age of the seed on the list.

The seed offered by the APS, which may not be 100% viable (capable of germinating) to start with, has been purchased at various times and each species usually remains on the list until its seed has run out. So age varies, with seed in older batches more likely to have lost some or all viability than recently purchased items. But although all seeds are believed to have a finite lifespan, age of itself doesn't necessarily mean that seed won't be viable because seed longevity is known to vary greatly between species. This can be frustrating: did my APS seed fail to germinate because it was too old and no longer viable; or because the right conditions were not provided; or even because I was impatient and chalked up a failure when a bit more time would have resulted in germination.

The longevity of seed is the time period over which it remains viable, but the shelf life of seed removed from its natural environment also depends on how the seed is stored. Seed left in a warm room in an unsealed packet can lose its viability very quickly. Longevity increases as temperature is reduced, roughly doubling for each 5°C decrease in storage temperature[1]. APS seed is kept in sealed containers (to keep it dry) in a refrigerator at 3°C. For seed collected to conserve plant genetic diversity, the Millennium Seed Bank recommends a storage temperature of -20°C.

Research into stored seed longevity and why it varies between different species can help seed banks, and other organisations, to identify which species are likely to have shorter-lived and which species are likely to have longer-lived seed. In what follows I have made use of research by Merritt et al. (2014)[2] to try and give members an idea of which species on the 2024 APS seed list are more likely to have retained their viability.

Factors affecting longevity

Seed stored in seed bank conditions can remain viable for a very long time which makes it difficult to directly measure how long it takes for germination to start to fall, let alone to decline to zero. But there are other ways. Controlled aging experiments are a recognised method of comparing the seed longevity of different species without knowing (or needing to know) their actual lifespan.

Merritt et al. used this method to compare the longevity of seeds of 172 Australian species in 44 plant families, ranking them from 1 to 172 in order of decreasing relative life span. The species they tested were representative of the main Australian plant families, with different seed types and life forms, and hailed from a range climatic zones including Mediterranean, temperate and tropical. Factors they found to be associated with longevity include:

- Seed dispersal mechanism

With some species seed is spontaneously released from its fruit as soon as it is mature, to wait in the soil until conditions are suitable for germination. Other species retain

some or all of their seed until the plant is exposed to specific environmental conditions, such as fire, a mechanism known as serotiny[3]. Serotinous plants, and woody trees and shrubs, generally have significantly longer-lived seeds than annual and herbaceous species.

Serotiny is a good indicator that seeds will be long-lived in storage, but no correlation was found between the degree of serotiny and seed longevity. Of the species studied, some of those with the relatively longest-lived seeds were *Corymbia* and *Eucalyptus* species which are only weakly serotinous.

• Seed characteristics

Species with seeds that possess physical dormancy[4] tend to be longer-lived, as do species whose seeds contain large embryos and not much endosperm (food storage tissue). Seed mass is also positively, but weakly, correlated with seed lifespan.

Seeds with large embryos (relative to seed size) and little or no endosperm are common amongst serotinous plants. In addition to *Corymbia* and *Eucalyptus*, species from the genera *Callitris*, *Allocasuarina*, *Banksia* and *Hakea* all tend to have long lived seeds.

Large embryos and physical dormancy are also often found together - for example in the pea (Fabaceae) and buckthorn (Rhamnaceae) families. Merritt et al. found such seeds to be amongst the longest lived. Of the top 30 species in terms of seed lifespan, fifteen had seeds with physical dormancy, including the four longest-lived: *Acacia colei*, *Mirbelia dilatata*, *Acacia holosericea* (all Fabaceae) and *Trymalium ledifolium* (Rhamnaceae).

Seed mass is less reliable as an indicator of seed longevity. While trees and larger shrubs tend to produce larger and relatively longer lived seeds compared with annual and herbaceous species, this is not always the case. In particular while *Eucalyptus* seeds tend to be long-lived they are often very small.

• Genetic relatedness

Seeds from species in the same order, family or genus often have seeds with similar life spans, although in some families there is a wide variation.

Merritt et al. found that species with relatively the longest lived seeds came from the she-oak (Casuarinaceae), buckthorn (Rhamnaceae), soapberry (Sapindaceae), pea (Fabaceae) and myrtle (Myrtaceae) families. Members of the Proteaceae showed a wide range of seed life spans, while species from the daisy family (Asteraceae) and grass family (Poaceae) tended to have shorter-lived seeds. Citing other researchers, they added that Australian terrestrial orchids (Orchidaceae) also have relatively short lived seeds, as do seeds of species belonging to the carrot (Apiaceae) and cabbage (Brassicaceae) families.

• Climate

Seeds sourced from regions of higher mean annual temperature and rainfall were found to be significantly longer-lived than seeds from cooler and drier regions, but this effect is quite weak.

So which species on the 2024 APS seed list are likely to have longer-lived seeds?

The Australian flora (vascular plants) is said to comprise approximately 21,000 native species[5]. A study that looks at 172 of these, however representative they are, inevitably has limitations, although species with long-lived seeds are more abundant in the

Australian flora compared with that of other regions in the world. Seed can last a long time when stored properly so just because it's old doesn't mean (some of) it won't germinate!

Species in the grass, daisy and carrot families are less likely to have very long-lived seeds. All the grass seeds and some of the daisy family seeds have been on the APS list for quite a long time now. Of the more recent Asteraceae acquisitions, *Ammobium alatum* was restocked in 2024. (This species was one of the 172 and emerged as relatively longer-lived (ranked 78) than all other Asteraceae tested.) *Calotis cuneifolia* was obtained in 2021 and yellow flowered *Xerochrysum bracteatum* was restocked from garden seed collected in 2019. The two *Raoulia* species, *Anaphalioides bellidioides* and *Celmisia semicordata* were purchased in 2023 but they are all from New Zealand whereas Merritt et al. restricted their work to Australian species. All the species listed under Apiaceae also come from New Zealand, and were also purchased in 2023.

The wonga wonga vine (*Pandorea pandorana*, a member of the Bignoniaceae) could also be mentioned in this context as it was ranked 170 in the study. This indicates a relatively short life span but just because APS seed was obtained in 2021 doesn't mean it is no longer viable.

At the other end of the scale Merritt et al. identified five plant families as having relatively longer lived seeds. This doesn't mean that all species in these families will have long lived seeds, or that they are the only families in the Australian flora that tend to have relatively long lived seeds.

One of these families is the Myrtaceae. At the time that Merritt et al. carried out their experiments the Australian species with the longest-lived seed known was *Calothamnus rupestris*, not only a member of the Myrtaceae but also a serotinous, woody shrub with non-endospermic seeds. In other words, this species, which is on the APS list, ticks the right boxes for longer lived seed, as do many *Corymbia* and *Eucalyptus* species which they tested.

Regarding gum trees, I once corresponded with much missed UK eucalyptus expert John Purse[6] about seed viability. He said that *Eucalyptus* seed retains its viability for many years if kept quite dry and stored in a fridge in a sealed container. As an example, in 2011 he got 85% germination of some E. glaucescens seed collected in the wild in the 1980s.

Merritt et al. didn't test any species of *Melaleuca*, *Callistemon*, *Kunzea* and *Leptospermum*, all genera in the Myrtaceae. The first two comprise woody shrubs or trees whose seeds lack an endosperm[7], with most temperate melaleucas retaining ripe seeds on the plant[8], as do most callistemons[9]. *Kunzea* and *Leptospermum* species are also woody shrubs and trees, with the majority of the latter retaining closed fruits containing ripe seed on the plant for many years. Kunzeas, however, shed their seed as soon as it is ready[8].

Seed of most of the Myrtaceae on the APS list was obtained five or more years ago, including all but one of the *Kunzea* species. (The most recent acquisitions are listed in the box.). However given that *Melaleuca*, *Callistemon* and *Leptospermum* tick some of the boxes for longer-lived seed, there would seem to be a good chance that much of the seed on the

list is viable. As an example, in 2023 I sowed *Melaleuca spathulata* seed obtained from the APS and I now have two healthy plants.

Three of the other four families found to have relatively long lived seed are less well represented on the APS list. All the *Allocasuarina* and *Casuarina* (Casuarinaceae) seed (with the exception of *A. torulosa*) is more than 5 years old but seed stored at 3°C is said to retain viability for many years[10]. This seed doesn't need treatment to germinate[9] but *Dodonaea viscosa* (Sapindaceae) seed does better with hot water treatment[11]. Its seed is also more than 5 years old but this species was one of the best performers in the Merritt et al study (ranked 17). Seed of the two *Pomaderris* species (Rhamnaceae) is also more than 5 years old, but this genus also has seeds with large embryos and physical dormancy, two other indicators of longevity, so APS seed may well be viable but difficult to germinate.

The fifth of the families identified as having longer lived seed is the pea family (Fabaceae) but species studied by Merritt et al showed quite a lot of variation in longevity. This ranged from *Acacia colei* (ranked 1) to *Davesia cordata* (115) with species tested that are also on the APS seed list coming between these two extremes: *Kennedia prostrata* (4), *Senna artemisioides* (11), *Acacia macrodenia* (19), *A. saligna* (43), *A. pycnantha* (71) and *A. retinodes* (98).

Many of the 'other pea family' species on the APS list have been purchased fairly recently, so seed should still be viable although treatment will probably be needed to promote germination. However older seed could well be fine too. Steven Harding (see page 28) provides an example of 25 year old *Clianthus puniceus* seed giving 80% germination.

Most of the APS wattle seed is quite old (see box for recent acquisitions) but I suspect that it too has a good chance of still being viable, though again treatment will be required to deal with physical dormancy. *Acacia* seed with a hard coat is believed to have a long storage life even at room temperature[10]; as evidence of this I have had quite a lot of success germinating various *Acacia* seeds collected over the years which, unlike APS seed, have not been stored in a fridge. While researching this article I even came across a 2009 report[12] of germination of 151 year-old *A. melanoxylon* and *A. farnesiana* (synonym *Vachellia farnesiana*, naturalised in Australia) seed that had been stored at room temperature and above. Admittedly only one out of 30 seeds of the former and 2 out of 37 seeds of the latter germinated but this reflects that seeds in any one lot may not age evenly.

The twelve members of the Proteaceae tested by Merritt et al. showed a very wide variation in longevity. Five - *Banksia ericifolia* (22), *B. attenuata* (26), *B. prionotes* (24), *B. menziesii* (33) and *Hakea petiolaris* (35) - were amongst the longest-lived while three - *Grevillea robusta* (153), *Lomatia myricoides* (165) and *Telopea speciosissima* (169) - were amongst the shortest lived. The latter three are not serotinous which Merritt et al. suggest may go some way towards explaining why their seeds might be relatively short lived in storage. However without knowing more about seed traits and dispersal mechanisms its not possible to say anything sensible about the likely viability of

Proteaceae seed on the APS list, especially as most of this seed is more than five years old (see box for most recent acquisitions). Again though, just because it's old doesn't mean it won't germinate!

The same caveats apply to APS seed of species belonging to the Malvaceae, none of which are among the species tested by Merritt et al. However in 2023 I had good results with all three species of *Brachychiton* after soaking them in hot water to break dormancy. All were acquired for the seed list 5 or more years ago. I also have one seedling of *Asterotrichion discolor* (Tasmanian currajong) grown from APS seed that is probably very old, and which I had stored at room temperature for 5 years. It did take nearly 6 months to come up, an example of the importance of not giving up too soon on seed showing physical dormancy.

We hope to restock the APS seed list in 2025. Please let me know if there are any species you would like us to try and obtain, but do remember the range of seed available is quite limited. I would also love to hear of your experience of germinating (or not) seed from the APS list, and also any other seed that you've had hanging around for a while, as this will help us decide what is worth purchasing.

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3. Merritt et al. use the term serotiny in the wide sense to mean 'the release of mature seeds is delayed and seeds are instead retained on the parent plant to form a canopy seed bank', without specifying the environmental trigger that initiates seed release. Other authors restrict serotiny to the case where the trigger is fire.

4. Seeds need warmth, water and oxygen to germinate. Seeds with physical dormancy do not germinate as soon as conditions are favourable but require exposure to a specific environmental trigger (or triggers) such as fire-caused heat or smoke, strong leaching rains, digestion by animals or a period of near freezing temperatures.

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APS seed list

Proteaceae species obtained within the past 5 years

Banksia coccinea
Bansia ericifolia
Banksia integrifolia
Banksia marginata
Banksia paludosa
Banksia praemorsa (wine flowers)
Banksia praemorsa (yellow flowers)
Banksia robur
Banksia formosa (*Dryandra formosa*)
Banksia nivea (*Dryandra nivea*)
Banksia stuposa (*Dryandra stuposa*)
Banksia undata (*Dryandra praemorsa* var. *praemorsa)*
Banksia undata var. *splendens* (*Dryandra praemorsa* var. *splendens*)
Buckinghamia celsissima
Grevillea eriostachya
Hakea nodosa
Orites revolutus

Acacia species obtained within the past 4 years

Acacia adunca
A. covenyi
A. declinata
A. fimbriata
A. lasiocarpa var. *lasiocarpa*
A. leptospermoides
A. nigricans
A. saligna
A. sulcata var. *planoconvexa*

Myrtaceae species obtained within the past 5 years

Callistemon salignus
Eucalyptus caesia subsp. *magma*
E. globulus var. *compacta*
E. leucoxylon subsp. *megalocarpa*
E. leucoxylon subsp. *rosea*
E. melliodora
E. orbifolia
E. preissiana
E. rubida
E. subcrenulata
Kunzea ambigua
Leptospermum brachyandrum
L. continentale
L. juniperinum
L. lanigerum
L. rotundifolium
L. rupestre
L. trinervium
Melaleuca huegelii
M. hypericifolia
M. nesophila
M. squamea
M. suberosa
M. virens (*Callistemon viridiflorus*)

Do you know you can access back copies of Pentachondra in the members section of the APS website? If you don't have a password contact Ben Ram at **webmaster@anzplantsoc.org.uk** or Jeremy Spon at **membership@anzplantsoc.org.uk**

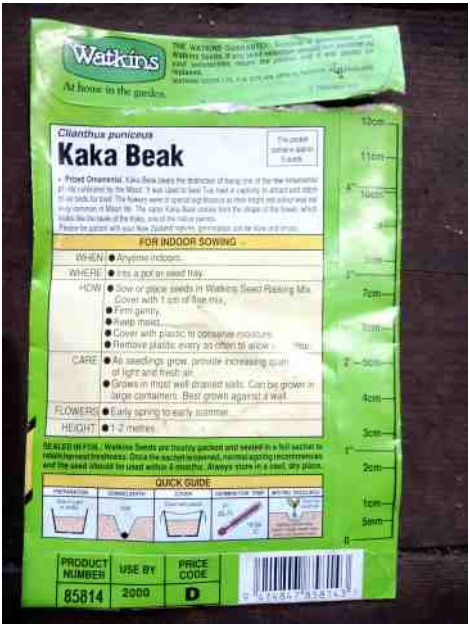
DON'T GIVE UP

Steven Harding

Three years ago I helped somebody with a house clearance and amongst the many things I had to re-home was a box full of mixed seed packets, mainly vegetables and salad crops. Mixed in with the various packets were a few flowering annuals and a packet labelled *Clianthus puniceus* (kaka beak, also known as lobster claw). I was reliably informed that this was sent as a gift in 1997 and the use by date on the packet was 2000.

Not being able to throw anything away without giving it a go, I sowed the five seeds two years ago. Four germinated and the mice ate three of them straight away. The remaining one is holding i's own. I appreciate everything has a use by date and I wasn't expecting any of the seed to remain viable after such a long time.

So if you have old seed tucked away, give it a go. You might be surprised.



The seed packet - more than twenty years old!



Steven's *Clianthus puniceus* growing away

Steven Harding

THE ROTTNEST ISLAND DAISY

Gary Firth

Maria and I have been fortunate enough to have visited Australia a few times over the years, ostensibly following some of the major orchid shows. We have been able to participate in National and International shows in Queensland (Townsville), Adelaide and Perth (more precisely Fremantle) and have on each occasion taken time to explore the local area with a particular interest in the plants and wildlife.

Our visits to Western Australia have been particularly memorable for the wild orchids and the huge variety of other plants and animals that we encountered. At that time it was possible to bring back commercially available plant seed and one seed company (Wildflora) catered to this need by selling a range of popular seeds such as everlastings, grass trees, kangaroo paws, Geraldton wax and coral creeper at tourist outlets. Invariably we would return home with our maximum allowance of seed packets (as well as orchid seedlings in flask).

In general we were very successful in germinating these seeds and one that particularly impressed was the Rottnest Island daisy (*Trachymene coerulea*). This was grown as an annual, producing the most delicate pale blue flowers (and occasionally white ones) up to 5cm across on plants that were about 60cm tall. These set viable seed so I was able to grow this plant for several years before losing it.

Earlier this year whilst discussing with Judy Clark desirable seed for the APS seedlist, I mentioned that I would love to be able to grow this again, possibly for sale at some of our plant fairs. Judy pointed out that seed was in fact available in the UK from Chiltern Seed but under the synonym *Didiscus caeruleus*.

A packet was duly purchased. The seeds germinated well and a number of plants were grown on individually in pots and subsequently flowered. I did find that when grown in pots in a greenhouse in relatively rich compost they tended to grow rather tall and lanky and so were only suitable for display at one of our shows this year. Next year I shall try again but pinch out more regularly (as recommended) and grow on a bit harder in order to produce more sturdy compact plants.



Gary Firth

Trachymene caerulea
Not actually a daisy - it belongs in the ivy family

AUSTRALIAN DAISIES

Judy Clark

Daisies are found all over the world, and that includes Australia which is home to about 1000 endemic species[1]. Most are unknown in cultivation in Australia, let alone Britain. However they do include a number of brightly coloured herbaceous plants which are easy to grow from seed and which would grace any garden. Many of these have long been known in cultivation in the northern hemisphere, so much so that their origins may have been forgotten.

Ammobium alatum, Winged everlasting

Found in New South Wales and Queensland and first recorded by Scottish botanist Robert Brown in 1804, *Ammobium alatum* seems to have been in cultivation in the UK by 1823[2]. This attractive perennial has winged stems, green leaves and yellow disc flowers that are surrounded by white bracts. It overwinters in my south coast garden but is perhaps best treated as an annual in harsher climates. It flowers copiously from about June (depending on whether plants have been overwintered), sets viable seed for me, and can also be propagated from cuttings or by division.



Ammobium elatum

Brachyscome iberidifolia, Swan River daisy

Found over much of South and Western Australia, this spectacular annual was in cultivation in the UK by 1841, according to a glowing piece in Curtis's botanical magazine[3]. Colourful it certainly is; the ray florets vary from mauve and purple through all shades of blue to white, while the central disc is black, yellow or brown. Sow in spring, the earlier the better.



Brachyscome iberidifolia

Pycnosorus globosus, Drumsticks, Billy buttons (usually sold as *Craspedia globosa*)

This perennial species was first described in 1837 (as *Craspedia globosa*) but I have not found any trace of it in cultivation in the UK until quite recently, although the related *Craspedia glauca* was cultivated as early as 1861[4]. Found in all four southern and eastern mainland states, it grows in inland areas and is usually found on heavier soils. It has tufts of soft silvery green leaves and tall stems topped with golden globes of tiny flowers. While it needs reasonable drainage it should also be kept moist. I find it a bit temperamental in the ground and for me it does better in pots which can be sheltered over winter.



Rhodanthe chlorocephala* subsp. *rosea

Rhodanthe chlorocephala subsp. *rosea*, Pink and white everlasting (sold as *Acroclinium roseum*, *Helipterum roseum*)

Described by English botanist WJ Hooker in 1854 under the name *Acroclinium roseum* and first grown in the UK around that time[5], this annual found in Western and South Australia has blue-green leaves and flowers which range from deep pink to pure white with bright yellow or deep black centres. Sow in spring, the earlier the better as it takes several months to flower, pinch out to encourage lots of stems, and watch out for slugs and snails.

Rhodanthe humboldtiana, Golden clusters everlasting (sold as *Helipterum humboldtianum*)

Although first published as *Helichrysum humboldtianum* in 1830 by French botanist Gaudichaud-Beaupré and described by Swiss botanist Augustin de Candolle in 1838 as *Helipterum humboldtianum*, the first reference I have found to its cultivation dates back to 1901[6]. A small Western Australian annual found on sandy soils, often with limestone, this dainty plant produces terminal clusters of tiny golden yellow flowers.



Rhodanthe humboldtiana

Rhodanthe manglesii, Pink sunray

Introduced by Captain James Mangles after whom it is named, and described by English botanist and gardener John Lindley in 1834 from a specimen growing in Mangles' garden in 1833[7], the beauty of this slender annual was immediately recognised. From the south west corner of Western Australia, it has heart shaped leaves and nodding pink flowers which emerge from silvery papery bracts, and prefers sandy or loamy soils. Seed is not easy to come by but can be saved.

Schoenia filifolia, Showy everlasting (sold as *Helichrysum subulifolium*)

I grew this in 2023. Because of the name under which it was sold I assume it must be the threatened species *Schoenia filifolia* subsp. *subulifolia*, rather than the more common *Schoenia filifolia* subsp. *filifolia* (synonym *Helichrysum filifolium*) but I haven't checked[8]. Found north of Perth, the species was described by Russian botanist and plant collector Nikolai Turczkaninow in 1851 under the name *Xanthochrysum filifolium*, but so far I've failed to find out when it was introduced into cultivation. It has threadlike leaves and flowers with gorgeous lemon yellow papery bracts. Seed germinates easily but my seedlings didn't much like being moved so in 2025 I plan to sow direct into containers.

Xerochrysum bracteatum, Golden everlasting (often sold as *Helichrysum bracteatum*)

Described as *Xeranthemum bracteatum* by French botanist EP Ventenat in 1803, and as *Helichrysum bracteatum* by English botanist and artist HC Andrews in 1805, this species was cultivated as early as 1799 in England, by Mr Colvill (presumably of Colvill's Exotic Nursery) who raised it from seed collected at Port Jackson in New South Wales[9]. *Xerochrysum bracteatum* (in the broad sense) is a very variable species that occurs in every state. It can be an annual, biennial or short lived perennial. Its leaves range from hairless to woolly and the large flower heads comprise a central disc of many tiny flowers surrounded by papery yellow, cream or white bracts. Breeding since the mid 1800s has produced cultivars in a huge range of colours and sizes, but I prefer the yellow ones. Some have



***Xerochrysum bracteatum* 'Dargan Hill monarch'**

overwintered in my garden and I have collected viable seed.

Speaking generally, all these plants like well drained soil and a sunny position though dappled shade will do for those that are found in woodland as well as grassland habitats. They tend to respond to fertiliser and dislike drying out or getting frosted. The smaller ones look great in patches or drifts and all do well in containers. Dead heading encourages repeat blooming. They make good cut flowers and dried specimens can last for many years.

Seed is quite widely available, albeit not always under the most up to date name. Chiltern Seeds, Kings Seeds and Special Plant Seeds are well-known companies from which I have purchased seed but a quick internet search will reveal others. As a general rule daisy seed needs light to germinate, so cover lightly with compost, or perlite, or not at all and keep the compost warm and moist. Good seed germinates quickly, but seed doesn't last long.

Old gardening books list other daisies that used to be in cultivation; for example the incense plant *Humea elegans* (now *Calomeria amaranthoides*) and the attractive pink annual *Schoenia cassiniana*. If you come across a seed supplier, please let me know!

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Seed of some of the species mentioned above are in our seedlist - the latest version is in the member's area of our website: **www.anzplantsoc.org.uk**. Don't forget that members can order up to 20 packets of seed from the list in each year of their membership. (If you are interested in seeds of daisies, you might want to wait for the 2025 version of the list, as we plan to add further species provided germination rates are acceptable.)

PŌHUTAKAWA

Alan Bryan

Many years ago I was fortunate enough to see some huge specimens of Pōhutukawa (*Metrosideros excelsa*), which is endemic to New Zealand, growing on the Coromandel peninsula. They make huge spreading trees when mature, wider than tall, and are festooned with aerial roots. The trees produce their bright crimson flowers around the time of the summer solstice, hence the common name New Zealand Christmas tree. The tree is easily separated from the other *Metrosideros* species grown in the UK by the fine grey hairs on the new shoots, and the grey underside to the very dark green obtusely tipped leaf. Pōhutukawa is not commonly seen growing outside in the UK due to its tender nature but can be seen occasionally in very favoured spots in Cornwall, and I believe there are large trees at Tresco Abbey Gardens in the Isles of Scilly.

I grew and flowered a Pōhutukawa bought from a Cornish nursery in a large pot in my greenhouse for several years,. It did very well, being put outside in the summer, but eventually got too big to get back in the greenhouse easily for the winter. An unexpected sharp frost reduced it to a tiny shoot near the base, and it soon gave up the ghost, despite a drastic prune and coddling in the greenhouse.

Over the years I tried several times to air layer it, so I could regenerate it when it got too big, but I never managed to get it to root. Cuttings are very difficult indeed. This is perhaps surprising for a tree which produces copious aerial roots when it is mature.

The easiest option is to grow it from seed, but seed loses its viability very quickly, and despite several attempts from various sources I have been unable to get any commercially available seed to germinate. Information on the internet from seed suppliers suggests germination is erratic and can take several weeks. However more accurate information from New Zealand based sites suggests that fresh seed germinates very rapidly.

A couple of years ago whilst I was on holiday in Cornwall I spotted a couple of Pōhutukawa growing in St Ives. Judging by the healthy appearance of the trees there must be very little if any frost at this site, which is within a stones throw of the sea in all directions. This year a friend and fellow botanist kindly sent me some fresh seed collected from these Cornish trees.

Seed was surface sown immediately on receipt on a mixture of peat, sand and grit, well watered and placed in a



© Simon Retallick

Mature *Metrosideros excelsa* growing in St Ives, Cornwall with a young *Trachycarpus* in the foreground

plastic bag with a little water in the bottom of the bag. The pot was placed on a north facing windowsill. Germination was visible 5 days after sowing and the cotyledons were expanding around days 7 to 8. The germination percentage was very high (almost 100%).

The pot was then placed in a shady propagator in the greenhouse, and transferred to the bench as the seedlings grew. They will be potted on into individual pots once they are a reasonable size.

One peculiar feature of Pōhutukawa which it shares with the other commonly grown *Metrosideros* species, *M. umbellata* and *M. robusta*, is that young plants are very soft in growth and extremely sensitive to cold for the first few years. They need to be kept at at least 5°C in the winter. Once the plant develops some woody tissue the plants are more cold tolerant, although for most of us this is a half hardy greenhouse shrub at best. If you happen to live somewhere that is completely frost free in the winter it may make a lovely small tree.

Another peculiar feature of Pōhutukawa is that air layers of flowering shoots retain their ability to flower, so staying quite compact in a pot. I suspect however that my seed grown plants may well take many years to reach the flowering stage.

My kind thanks to Simon Retallick for permission to use his photos of the St Ives trees, and of course the seeds!



© Simon Retallick

Close-up of leaves and flower buds showing the tomentose (finely hairy) young leaves and shoots



Alan Bryan



Alan Bryan

Seed germinating at day 7 from sowing (top); Young seedlings, thinned out and ready to transplant at 6 months from sowing

AN AVENUE OF EUCALYPTUS

Mike Saalfield

In early October our group walked along the track beneath two rows of mighty eucalyptus trees, their pungent smell filling the air and their peeling bark hanging off in long, twisting strips. We scanned the branches for koalas but none were to be seen. Not really surprising, as this was no Australian outback but rural Buckinghamshire not far from Amersham and about a mile south of Little Missenden.

I'm no expert on eucalyptus species and at first I assumed that these trees were examples of the hardy *Eucalyptus gunnii* (cider gum) species often seen growing as single specimens in the UK. Judy Clark suggested that from my photos the trees didn't look quite right for this species. Dr Owen Johnson of the Tree Register, with the help of Stephen Verge, confirmed they are almost certainly *Eucalyptus glaucescens*, the Tingiringi gum.

The long hanging strips of bark are characteristic of *E. glaucescens*, and although the gumnuts are a bit urn shaped, like those of *Eucalyptus urnigera*, they are not grouped at the end of a slender stem as in that species. Known as the Tingiringi gum, it can reach 50m in its native habitat. It is found in the high country of eastern Victoria and south eastern New South Wales, and so should be pretty hardy in most parts of the UK.

I found a Google Earth historical satellite image which shows trees at this location (SU92409730) in 2003; you can see how tall they are now. I have never before come across an avenue of so many trees – around thirty in total. Does anyone know of something similar?



Mike Saalfield

***Eucalyptus glaucescens* gum nuts - cup shaped and occurring in threes**



Mike Saalfield

The long strips of hanging bark are a giveaway



Mike Saalfield

Some of the trees in the avenue of Eucalyptus

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MOUNTAIN PEPPER - A MUST-HAVE

Judy Clark

Mountain pepper is one of seven *Tasmannia* species endemic to Australia (eight if two subspecies are counted separately). *Tasmannia* belongs to the Winteraceae, a small family that also includes *Drimys* and *Pseudowintera*. The accepted scientific name of mountain pepper is *Tasmannia lanceolata* but in the UK it is often sold under one its synonyms, frequently as *Drimys lanceolata* but sometimes as *Drimys aromatica* or *Tasmannia aromatica*.

The name *Tasmannia* commemorates Abel Tasman, the 17th century Dutch explorer after whom Tasmania is also named, and where it is widespread. It is also found in Victoria and New South Wales. It occurs mostly in wet forests and mostly at higher altitudes.

So why is mountain pepper a must-have?

It's really attractive.

The young stems are reddish and the aromatic leaves are a glossy green. Its creamy yellow flowers have reddish buds and, although they are small, there are lots of them. My plant started flowering quite young. It went into the ground in 2019 and has flowered (in spring) for the last three years.

It grows quite slowly.

Mine has put on about 60cm since I planted it (although admittedly it has been moved once). It usually makes a shrub or a small tree although it can eventually reach quite a height; the tallest specimen on the Tree Register, at Colonsay House in Argyle and Bute, comes in at 8m. Fortunately it responds well to pruning.

It is probably hardy in most of the UK.

Elliot and Jones[1] state that it tolerates most frosts and light snowfalls while Ross and Irons[2] give the danger zone as -10 to -15°C. Even the RHS, who in my experience are quite conservative when it comes to



Judy Clark

Buds and leaves



CSIRO CC BY 3.0

Berries

hardiness ratings, give it an H4[3]; that is, coping with a minimum temperature range between -10 and -5°C. In colder areas it would be wise to protect a young plant in winter until it gets established. In really cold areas it can be grown in a container and sheltered in a garage or similar over winter.

It's a plant for damp and shady places.

I count this as a plus because in many gardens such a preference is easier to accommodate. It likes partial or dappled shade out of the way of drying winds, and positively dislikes full sun and high temperatures. It prefers an acidic and reasonably well drained soil, and, as might be guessed from its native habitat, mountain pepper does like it moist. It needs watering during extended dry weather.

It's edible.

The leaves and berries have a spicy peppery taste and can be used fresh or dried to flavour a variety of dishes, sauces and dressings. It owes its hot taste to a chemical called polygodial[4], a substance also found in the leaves of two related species, *Pseudowintera colorata* (horopito, endemic to New Zealand) and *Drimys winteri* (winter's bark or canelo, found in temperate forests in Chile and Argentina), as well as in the leaves of the cosmopolitan annual water pepper (*Persicaria hydropiper*)[5].

And the downsides?

To my mind there is only one. Mountain pepper is dioecious, with male and female flowers on separate plants. If you want berries both a male and a female plant are needed. The RHS[3] lists 32 suppliers but many don't even mention the male-female division and those that do usually just comment that they can't guarantee the sex of your purchase. I'm still looking!

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Murray Fagg CC BY 4.0

Female flowers

HARD TO KILL: HERE'S WHY EUCALYPTS ARE SURVIVAL EXPERTS

Gregory Moore

They can recover from fire. Grow back from a bare stump. Shrug aside bark loss that would kill a lesser tree. Endure drought and floods.

Eucalypts are not interested in dying. They're survivors. The world's 800-plus species are almost all found in Australia, a continent with old, degraded soils and frequent fires and droughts.

In the fossil record, they first appear about 34 million years ago. As the Australian continent dried out, eucalypts gradually emerged as the dominant trees in all but the most arid and tropical areas.

But what is it about eucalypts that makes them survivors? It's a combination. Leathery leaves. Fire-resistant bark. Dormant buds under bark, waiting for fire. Mallee roots (lignotubers) at ground level to let them regrow. Roots which put out special chemicals to unlock scarce nutrients. And gumnuts which use fire to germinate and get a head-start on any rivals.

In a difficult place to survive, they thrive. Here's how they do it.

Leaves

Many gum species have leaves which hang vertically. These adaptations are about water. Water in Australia is often scarce, and it makes sense for trees to hold onto it when they have it. Vertical leaves means less direct sun, which means less evaporation. Their dry, leathery leaves also keep the water inside. It also improves their tolerance to bushfire.

Bark

Stringybark, ironbark, candlebark – the bark of eucalypts is used to



Krzysztof Golik, CCA-Share Alike 4.0 International



John Tann CCA 2.0 Generic

Eucalypts have many types of bark, from the stringybark of messmates (*Eucalyptus obliqua*, left) to the thick furrows of ironbark (*Eucalyptus sideroxylon*, above)

identify them. But it's also one of their great adaptations. The bark is often an excellent insulator against hot, dry summers as well as a protective barrier against fire.

Stringy bark is so fibrous that despite singeing and looking black on the surface, it often doesn't burn, meaning buds beneath it are protected from damage.

Buds

Underneath the bark of a normal-looking eucalypt lie thousands of dormant buds. These invisible "epicormic" buds are a remarkable adaptation, letting the tree rapidly regrow after bushfires, severe insect and animal grazing, storms, droughts or floods.

You can spot epicormic shoots sprouting up and down the trunks of gum trees after a fire, making them look like "toothbrush trees".

Epicormic shoots can grow 27cm in a single day, or up to 6 metres in a year. When epicormic buds touch soil, they can sometimes develop as roots. This allows fallen trees or even large branches to re-establish and anchor after storms and floods.

You can sometimes see hundreds of woody spines on the trunks of old dead trees. These are a pointy reminder of how many undeveloped epicormic buds lurk under the bark.

Mallee roots (lignotubers)

As remarkable as epicormic buds are, they're not the recovery mechanism of last resort. That job falls to the bulge at the bottom of many eucalypt trunks, which we often call "mallee roots".

These are lignotubers, remarkable adaptations possessed by most eucalypts.

Cabrils CCA-Share Alike 4.0 International



Epicormic shoots emerge from *Eucalyptus* buds hidden under the bark after a bush fire

To appreciate the complexity and biological beauty of a lignotuber, imagine the trunk of a eucalypt with all its epicormic buds scrunched into a ball at the base of the trunk. The buds have direct access to a large root system able to supply water, nutrients and carbohydrates.

This is a gum tree's emergency reboot option. Even when the tree above is falling apart, the lignotuber can rapidly regrow the tree at a rate of 6 metres or more in a year.

Roots

The roots of species such as river red gums drive deep into the soil along water courses, searching for subterranean water supplies as a backup in case the river dries up.

For other species, the solution to limited water is to send roots far and wide, often many times further than the tree's height. In many species, the lignotuber and roots are buried under an insulating layer of soil. This acts as protection against fire.

That's not all. Many eucalypt species produce "exudates" from their roots – chemicals which leach into the soil and free any locked-up nutrients in poor soils.

Still other exudates seep out to help feed mycorrhizal fungi in the soil. The gum trees do this as part of a wonderful symbiosis, allowing both tree and fungus to thrive. The gum gives sugar, the fungi give water and nutrients.

This underground exchange greatly improves soil quality and lets other species grow in difficult conditions.

Gumnuts

Gumnuts – woody fruits of eucalypts – are familiar to many of us from May Gibbs' famous Snugglepot and Cuddlepie stories.

These capsules protect the tiny seeds inside from desiccation and fire. After a fire, eucalyptus fruit may be damaged or dry out. This frees the fine seeds, which sprinkle over the soil like pepper over dinner.

Some eucalypts rely not on lignotubers or epicormic buds but on the seeds contained and protected in those woody gumnuts. The seeds fall to the ground and germinate when conditions are right renewing the forest.

Survivors – but not immortal

In the years ahead, we'll see natural disasters occurring more often and with greater ferocity as the climate changes. And in the aftermath, we will also see the spectacular and rapid responses of eucalypts – one of the world's great families of survivors.

But we will also see dead forests. Gum trees do perish, despite their abilities to regenerate. Some species such as mountain ash are not coping with pressures such as logging and climate change, while thin-barked snow gums are struggling to cope with new fire regimes. Every living thing has limits.

THE CONVERSATION

Reprinted from The Conversation, 21 February 2024 (**https://theconversation.com/hard-to-kill-heres-why-eucalypts-are-survival-experts-222743**)

Gregory Moore is Senior Research Associate, School of Ecosystem and Forest Sciences, The University of Melbourne

A note on Australian children's' literature

For those who did not grow up with Australian children's' literature, Snugglepot and Cuddlepie, cherubs wearing eucalyptus seedpod caps with bare bottoms and long-lashed wide eyes, are gumnut babies, so called because they live in gumnuts. May Gibbs' best known work, Snugglepot and Cuddlepie, was published in 1918, but she wrote and illustrated a number of other books about the same characters.

Although Melbourne born and bred I don't recall the gumnut babies from my fifties childhood. Books that I do remember reading include The Magic Pudding (Norman Lindsay), Blinky Bill (Elizabeth Wall), the poems of Banjo Patterson and everything by Mary Grant Bruce. As an adult I don't find May Gibbs' work particularly appealing. Her books can be accessed online; go to the State Library of New South Wales (**https://www.sl.nsw.gov.au/**) and search for Snugglepot and Cuddlepie. .

Judy Clark

BITS AND PIECES

compiled by Judy Clark

New Caledonian plants at the Jardin des Plantes, Paris

Bram van Mol recently made a trip to Paris and wrote as follows about his visit to the Jardin des Plantes.

Anywhere I go the botanical garden is always one of the first places I try to visit. The garden is conveniently situated right next to the Natural History Museum. The outside collection (free entry) isn't too interesting Australasian plant wise, apart from some corokia, muehlenbeckia and *Coprosma propinqua*. However the glasshouses (small entry fee) have a small section dedicated to the flora of New Caledonia. Despite the fact this island is home to an incredibly diverse flora with the world's highest rate of endemism, with 100+ endemic genera and including 14 endemic Araucaria species and *Amborella trichopoda*, it's very under-represented in botanical collections.



Bram van Mol

***Arthroclianthus* sp.**



Bram van Mol

Jasminum simplicifolium* subsp. *leratii

Some plant species to be seen there are several araucarias including *Araucaria scopulorum* (an endangered species), *Ixora margaritae* (another endangered species), *Barringtonia neocaledonica*, *Cupaniopsis glomeriflora* (*Lepidocupania glomifera*), *Arthroclianthus*, *Jasminum simplicifolium* subsp. *leratii*, several endemic pittosporums and a lot of ferns. So it's surely worth a visit. Upon leaving one of the gardeners informed me that there is another glasshouse dedicated to New Caledonian flora the Jardin des Serres d'Auteuil, but that will be for my next visit.

Germination information: some alpine and subalpine shrubs

I recently came across some germination information for *Acacia alpina*, *A. obliquinervia*, *Bossiaea foliosa*, *Hovea montana*, *Oxylobium ellipticum* and *Grevillea australis*, the fruit of research carried out by Elizabeth MacPhee for a Masters degree*. She found *G. australis* did not respond to germination pre-treatments, but all the other species responded well to scarification and/or

stratification. Germination of *A. obliquinervia* was improved with boiling water treatment while nicking gave the best result for the other legumes. Stratification periods between 8 to 14 weeks for *A. alpina*, 2 to 8 weeks for *H. montana*, 4 to 6 weeks for *O. ellipticum* and 12 to 14 weeks for *B. foliosa* significantly boosted germination. Field establishment of this last species was enhanced when stratification was preceded by treating seed for 30 seconds in boiling water, and the seed was sown in autumn.

*MacPhee, E. (1998). Studies of the germination of seven Australian alpine and subalpine shrub species. Masters Research thesis, Land and Food Resources, The University of Melbourne.

Plant name changes

Carex expanded to include Uncinia

Uncinia species in the New Zealand flora have been moved to Carex (RHS Plant Review, September 2024, pp 61-2). So the red to reddish green *Uncinia rubra* becomes *Carex punicea* and the usually green to yellow green *Uncinia uncinata* becomes *Carex uncinata*.

According to the New Zealand Plant Conservation Network (**www.nzpcn.org.nz/**), in the southern part of its range *C. uncinata* plants are often dark wine-red, and this form has erroneously been sold as *Uncinia rubra* within the horticultural trade. This information led me to check what characters differentiate the two species and hence the name of the plant which has been spreading gently round my garden for many years.

My plant came as *Uncinia rubra* (now *Carex punicea*) but I think it may have been wrongly named. *U. uncinata* (now *C. uncinata*) has a little hook on the end of the leaf blade, just like my plant. Its red leaves make it a very attractive plant but beware the hooked fruits (technically utricles) waiting to attach themselves to passing animals - and bare human skin.

Revision of Leptospermum

A recently published article* proposed revising the classification of a number of *Leptospermum* species into three new genera (*Apectospermum*, *Aggreflorum* and *Gaudium*) and one revived genus (*Leptospermopsis*). These changes have been accepted by Kew (see Plants of the World Online **https://powo.science.kew.org/**) but changes to the names of the Australian species affected have not (yet) been accepted by the Australian authority for plant taxonomy, the Australian Plant Census (**https://biodiversity.org.au/nsl/services/search/taxonomy**), because some Australian state herbaria have not accepted them.

This situation may well change but until the name changes are accepted by all Australian taxonomists the APS will continue to use current names. The proposed changes do not affect many Leptospermum species, but you may come across them. They include four on the APS seed list:

Leptospermum brachyandrum to *Aggreflorum brachyandrum*

Leptospermum erubescens to *Leptospermopsis erubescens*

Leptospermum glaucescens to *Gaudium glaucescens*

Leptospermum trinervium to *Gaudium trinervium*

* Wilson, Peter G. & Heslewood, M.M. (3 May 2023), Revised taxonomy of the tribe Leptospermeae (Myrtaceae) based on morphological and DNA data. *Taxon* 72(3).

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Rhodanthe manglesii