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Flora for Fauna

The horticultural industry is promoting this scheme to plant native species for the benefit of wildlife. All natures living creatures, birds, animals and the myriad of small creatures, depend upon the natural flora, the bush around us.

The ideal objective is to restore nature's biodiverse world in reserves, corridors and landscapes, leaving adequate space for food production and recreation. Thousands of our readers have been busy for years, rehabilitating degraded areas and guiding property owners in restoring natural enclaves. In this issue we confine our concern to residential areas.

Flora for fauna is principally directed to developed areas where even suburbia can dramatically contribute to the survival of biodiversity. While the suburbs should have some local plants natural to the area that was, we need also to engage 'intensive farming', and enhance our gardens. We need plants developed for horticulture, choosing those that enhance our house or business.

The genus **Grevillea**, the subject of this issue, consists of a large group of plants that are exceptionally valuable in nature.

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Front cover: ***Grevillea calliantha***, Photo Neil Marriott See page 245.

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Popular Hybrids: *Grevillea*

A review of new release hybrids and those in the waiting ____ Merv Hodge*

In early days, *Grevillea* growing in Queensland was largely influenced by what was developed in the south. *Grevillea banksii* was the only tropical *Grevillea* around for some time so there was no possibility of tropical hybrids. Eventually *Grevillea whiteana*, *G. sessilis* and *G. pteridifolia* appeared in collections and all that was required was for these to be grown with *Grevillea banksii* to trigger a range of spontaneous hybrids.

However, before that was to happen, a hybrid occurred in the large species collection of David Gordon. This, of course, was *Grevillea* 'Robyn Gordon'. There were small numbers of cutting-grown plants available at first, but when it became known, there was a tremendous demand for it. It was reputed to be the top selling plant in Australia for a time. Not only was this a beautiful hybrid, but it was the first with one parent being an eastern Australian tropical *Grevillea* and the other parent from Western Australia.

Grevillea 'Robyn Gordon' was followed (not in order of occurrence) by *Grevillea* 'Coconut Ice', *G.* 'Honey Gem', *G.* 'Misty Pink', *G.* 'Moonlight' (originally *G.* 'Edna Ellen'), *G.* 'Ned Kelly' (originally *G.* 'Masons Hybrid'), *G.* 'Pink Surprise', *G.* 'Sandra Gordon' and *G.* 'Superb'. All were *F1 tropical hybrids with *G. banksii* a common parent, with the exception of *Grevillea* 'Sandra Gordon' (a *Grevillea sessilis* x *G. pteridifolia* hybrid).

Grevillea 'Superb' and *G.* 'Coconut Ice' are the result of deliberate manipulation by myself and are sister plants from the same batch of seed (about 1978). They may have been the first to be manipulated. Two others from the same batch of seed are still in my garden. One is identical to *G.* 'Superb' and the other is similar in colour to *G.* 'Robyn Gordon' but has a yellow tip on the style. This is also a characteristic of *G.* 'Superb', making it easy to identify from *G.* 'Ned Kelly', *G.* 'Robyn Gordon' and *G.* 'Coconut Ice'. Apart from *Grevillea* 'Superb' and *G.* 'Coconut Ice', all other F1 hybrids mentioned above were spontaneous hybrids. I suspect that most of the other hybrids now appearing in nurseries are *F2 or of a greater order.

Gardener's Tip:
Grevillea banksii is a superb plant and easy to grow.

*This report is based on an address given by Merv Hodge at the Fred Rogers Seminar in November 2000. Biannually, the Australian Plants Society in Victoria sponsors a major four-day seminar, this one devoted to *Grevillea*, covering recent advances in nomenclature, cultivation and propagation. The program includes garden and field visits, in this case in the Grampians area of Victoria. Hundreds of enthusiasts attend these well-organised functions. In this case, the function was organised by the *Grevillea* Study Group and the Grampians Group of the Society. Well-presented papers were published and, as they are now sold out, some of the important information is now made available to readers. The Fred Rogers Seminar in 2002 will study *Boronia* and related species. Interested? Contact the Victorian Society listed inside the rear cover.

* The different generations and matings have been given precise names in order to avoid confusion. The initial generation is the parental or P, the first cross is the filial or F1 generation, and the F1 mated to each other produce the second filial or F2 generation. The F2 is also known as the 'intercross'.



Grevillea 'Butterscotch' N. Marriott
see page 238



Grevillea 'Dot Brown' N. Marriott
see page 238

Grevillea 'Tango' (1 m x 3 m) is a hybrid between *Grevillea bipinnatifida* (glaucous form) and *G. formosa*. The originator was Chris Nikolic of Queensland. It has much going for it – easy to propagate, very good foliage, prunes well and has beautiful 150 mm long tangerine flower spikes (hence the name). Unfortunately, it carries very few flowers. It seems to grow in a wide range of conditions. If it was not for the poor flowering it would be one of the best ornamental grevilleas. I have tried to manipulate a similar hybrid, using another form of *Grevillea bipinnatifida*, but unfortunately the result was a very poor plant that had a complete lack of vigour.

Grevillea 'Golden Yul-lo', a spontaneous seedling of *G. 'Sandra Gordon'*, has yellow flowers over most of the year. It is popular with many growers. It was one of the cut flowers used in the Olympic bouquets. Photo on page 237.

Grevillea 'Coastal Sunset' is a recent release and has a colour not seen in most tropical *Grevillea*. It is distinctly orange and plants in flower generally sell quickly. *Grevillea* 'Golden Yul-lo' and *Grevillea* 'Coastal Sunset' were developed by Mr. Owen Brown of Queensland. Both plants are protected by PBR.

Gardener's Tip:
Grevillea
derived from
G. pteridifolia
or *G. 'Golden*
Yul-lo' will be
tall.

Grevillea 'Sunset Bronze' is a bronze red flowered spontaneous hybrid in the Loganholme district of SE Qld. Fortunately cuttings were obtained before the original plant was destroyed. The plant tends to be very untidy and is difficult to maintain in good condition. However, the flowers are spectacular and it sells well. It is a tropical *Grevillea*, probably having *G. 'Honey Gem'* in its lineage. At this stage, plants are two-thirds the size of *G. 'Honey Gem'*.

Grevillea 'Strawberry Blond' is a spontaneous hybrid from my garden with *Grevillea* 'Sandra Gordon' being the most likely seed parent. The nearby possible pollen parent is either *Grevillea caleyi* or *G. asplenifolia*. Cuttings were given to Fairhill Nursery who produced and named the plant. The flowers have a pale yellow style with a red perianth. It grows to 3 x 5 m and has maintained moderate popularity for some years, but I don't know why.

Grevillea 'Firesprite' is another spontaneous hybrid in my garden, the parentage being *Grevillea longistyla* (seed parent) and *G. venusta*. It has been released for about 3 years and has maintained an increasing popularity. It grows to 3 x 5 m, tending to be more spreading than *G. longistyla*. It can withstand very hard pruning which makes it a denser shrub. In my garden its peak flowering is June to December, with scattered flowers throughout the rest of the year. It is very popular with birds, particularly the small honeyeaters, i.e. Brown Honeyeater, Scarlet Honeyeater, Eastern Spinebill and others. It makes a good screen or specimen plant. I rate *Grevillea* 'Firesprite' as one of the best of the recent introductions because it is attractive, has a long flowering period, attracts birds, is normally reliable and is very different to other tropical hybrids. A second seedling of the same cross has occurred in my garden. The foliage is much the same but the flowers are slightly larger and more red than *Grevillea* 'Firesprite'. Photo on page 237. For cutflowers see page 268.



Grevillea 'Billy Bonkers'

see page 238

N. Marriott

Mixed hybrids

N. Marriott
see opposite





Grevillea 'Jester'
see page 238

N. Marriott



Grevillea 'Firesprite'
see pages 239 & 268

N. Marriott



Grevillea 'Golden Yul-lo'
see page 239

N. Marriott

One F2 which has a striking colour and has potential for cut flowers is *Grevillea* 'Majestic'. This is a seedling of *Grevillea* 'Pink Surprise' and occurred in the garden of Graham Nosworthy. Another F2 is *Grevillea* 'Sylvia' (a seedling of *Grevillea* 'Pink Surprise') produced by R. Dawson of the Utingu Nursery in Queensland. It is a very beautiful plant and is still popular.

Grevillea hybrids introduced in recent years

Grevillea 'Butterscotch', aptly named because of its flower colour, is a seedling that occurred in the garden of Society member Arnold Sandell. Of unknown parentage, I suspect *G. 'Misty Pink'* and *G. pteridifolia* are in its lineage. It flowers for most of the year, growing to 3 m x 4 m. Photo on page 236.

Grevillea 'Honey Wonder' and *G. 'Lime Spider'* are variegated sports arising from *Grevillea* 'Honey Gem' (photo on page 276). Their flowers are very similar to *G. 'Honey Gem'* although they may not carry as many flowers.

Grevillea 'Dot Brown' is a shrub to about 3 m x 4 m and has greyish-red flowers. Protected by PBR, it has not proved to be very popular. Photo p 236.

Grevillea 'Golden Lyre' and *G. 'Cooroora Cascade'* are two hybrids originating from Fairhill Nursery in Queensland, not to be confused with *Grevillea* 'Poorinda Golden Lyre'. *Grevillea* 'Golden Lyre' is a manipulated hybrid between *G. formosa* and *G. 'Honey Gem'*. It grows to 3 m x 5 m. It flowers during late summer and autumn and has yellow flowers very similar to its parent, *Grevillea formosa*.

Gardener's Tip:
Hybrid
Grevilleas need
full sun and
good drainage.

Grevillea 'Cooroora Cascade' is an F2 seedling of *Grevillea* 'Golden Lyre'. It is a smaller plant, about 1 m x 2 m, and has potential to become very popular. The flowers are yellow and similar to *Grevillea formosa*. The foliage is less inclined to spoil in humid weather than *Grevillea formosa*.

Grevillea 'Billy Bonkers' is a hybrid between *Grevillea nana* ssp. *abbreviata* and *Grevillea* 'Sid Cadwell'. It requires grafting to survive, at least in Queensland, and has enjoyed some popularity. It tends to become rather stiff and woody but it is rarely out of flower. Perhaps grafting onto another rootstock (i.e. not *Grevillea robusta*) might improve its growth habit. This has certainly improved other grafted plants. *Grevillea* 'Billy Bonkers' seems to grow only to about 1 metre high, making it a good plant for small gardens. Its claimed parentage would indicate it would do well in southern states. *Grevillea* 'Billy Bonkers', *G. 'Flamingo'*, *G. 'Geisha'*, and *G. 'Jester'* are hybrids produced by Richard Tomkin at Gin Gin, Queensland. Photo on page 240.

Grevillea 'Flamingo' is a shrub 2–3 m x 3 m. It has beautiful pink flowers and should enjoy a sustained popularity. It was shown briefly on television by Don Burke and provoked a number of enquiries at retail nurseries. The name is very appropriate.

Grevillea 'Geisha' is a hybrid between *Grevillea* 'Superb' (seed parent) and *Grevillea whiteana*, and grows to 3 m x 4 m. I have not seen this plant at this stage. Its main importance seems to be that it is the parent of *G. 'Flamingo'*.

Grevillea 'Jester', a hybrid between *Grevillea* 'Honey Gem' and *Grevillea* 'Coconut Ice', has orange flowers with a long flowering period and grows to 3 m x 5 m. Photo on page 237.

Vase of mixed hybrids opposite:

From left to right around the outside: *Grevillea* 'Superb' (red), G. 'Misty Pink', G. 'Pink Surprise', G. 'Misty Pink', G. 'Robyn Gordon' (red), G. 'Misty Pink' (top pale pink), G. 'Sylvia' (two pale red flowers) G. 'Honey Gem' in front of G. 'Moonlight', G. 'Sylvia' and *Grevillea* 'Robyn Gordon' (red in centre front).

Grevillea 'Pink Ice' is another spontaneous hybrid of mine that is worth mentioning, the seed parent being *Grevillea* *zygoloba* which it resembles. It grows to 1.5 m x 3 m, flowering mainly in late winter and spring. The fragrant flowers are very small and are carried on vertical terminal inflorescences up to 75 mm long. The flowers are initially pink, changing to white. The pollen parent is either *Grevillea* *crithmifolia* pink or *G. levis*. The former is the most likely candidate. In Queensland it needs grafting onto a reliable rootstock to survive. I have grafted it onto *Grevillea* *robusta* and a *Grevillea* *barklyana* hybrid quite successfully. It needs pruning to improve the shape of the plant.

Grevillea 'Goldilocks' is a manipulated hybrid of mine between *Grevillea* *bipinnatifida* (seed parent) and *Grevillea* *juncifolia*. It grows to 2 – 3 m x 2 m. The more deeply divided foliage, when new, is very attractive and grey. In humid climates the old foliage tends to become dirty looking and unattractive. This can be overcome by pruning. The flower spikes are orange/yellow and attractive but they suffer with bud drop. This problem doesn't show up in either parent. This plant would be more suitable for less humid regions.

Grevillea 'Simply Sarah' is a manipulated hybrid by Grevillea Study Group member, Bryson Easton. The seed parent is *Grevillea* *longifolia* (its habit being similar to this parent) and the pollen parent is *Grevillea* *beadleana*. It produces burgundy-red toothbrush flowers throughout the year, but peak flowering is late spring, summer and autumn. It grows to 3 m x 3 m, is drought tolerant and is reliable in all sites. It attracts birds and can be pruned heavily, making it useful for hedges and screens.

Gardener's Tip:
Grevillea
species are ideal
plants to attract
birds to the
garden.

Grevillea 'Long John' (sometimes incorrectly labelled G. 'Elegance') is not a recent introduction but deserves special mention. I have a seedling of *Grevillea* 'Long John' which is similar to the parent plant but has slightly larger and paler flowers. It is not as good as *Grevillea* 'Joy', a seedling of the same parent, similar to *Grevillea* 'Long John' but with beautiful red flowers. It will have a good future. In sub-tropical regions it will probably need grafting.

Grevillea 'Misty Pink' is a plant that has been around for a long time. It has produced seedlings in my garden and they range from a deep red to various shades of pink to white. We will release two of these. *Grevillea* 'Rosy Pink' is a rosy pink colour in perianth and style. *Grevillea* 'Pink Ballerina' has a paler but distinct pink colour in both perianth and style. Both have a long flowering period. There are a number of others, including reds, yellows and gold that have much potential but need monitoring to see how they perform in flowering, size and reliability and to determine their commercial viability.

Grevillea 'Pink Midget', a plant 30 cm x 60 cm, is a seedling of *Grevillea* *leiophylla* and has the assumed pollen parent *G. humilis* ssp. *maritima* (formerly *G. linearifolia*). It is similar to *Grevillea* 'Amethyst' in flower and foliage, but has a more compact growth habit, softer foliage and a more extended flowering period.

Grevillea 'Peaches and Cream' is a hybrid from the garden of Jan Glazebrook and Denis Cox at Logan Village, Queensland. Its parents are a procumbent white-flowering form of *Grevillea banksii* and a glaucous leaved form of *G. bipinnatifida*, which has orange flowers. This naturally bushy plant grows to 1.2 m x 1.5 m. The flowers open cream and darken to apricot, giving a two-toned effect. Flowering is prolific for most of the year. The plant is very drought resistant, but responds to more moisture. Plants have grown in various positions and no problems have been encountered. They respond to heavy pruning, though this is not often required as they produce new growth in the bush naturally.

Another notable hybrid from Jan and Denis is a cross between *Grevillea wickhamii* (orange form) and *G. miniata*. The leaves and the growth habit are similar to *G. wickhamii* and the flowers are yellow, similar to *G. miniata*. The plant needs grafting but is very popular. Its tropical parentage may mean that some proving is required in southern states. No cultivar name as yet.

Grevillea 'Philomena', which has red flowers and long weeping branches, and *Grevillea* 'Strawberry Sundae' with large flowers in tones of cream, apricot and pink, are recent releases from Neilsen's Nursery in Queensland. They are two more hybrids of *Grevillea bipinnatifida* and *Grevillea banksii* parentage. These have discernible differences in colour and foliage.

Because of the great range of hybrids now available we can afford to be ruthless and select only the best of those which are obviously different. I believe they should be reliable over a wide range of conditions, they should flower for a long period (preferably all year) and should be easy to propagate. Small size is another distinct advantage.

I believe that, in Queensland at least, it was the tropical *Grevillea* hybrids that triggered a public interest in Australian native plants, particularly because of the attraction of birds to the garden. Unfortunately, there was a widespread belief generated that native plants required no maintenance, hence the myth "Grow native for a no maintenance garden". After a time there was some reaction against natives because of second-rate landscaping. We now advise people to plant judiciously and prune when required, check size, do not over-plant and give attention to drainage and fertiliser.

In south-eastern Queensland some of the older hybrids are still the most popular. They include *Grevillea* 'Honey Gem', *G.* 'Misty Pink', *G.* 'Robyn Gordon', *G.* 'Superb' and *G.* 'Sylvia'. *G.* 'Moonlight' is fairly popular but its size deters some. Other good sellers are *Grevillea* 'Firesprite', *G.* 'Austraflora Bon Accord' and *G.* 'Long John', but the latter two need to be grafted.

Most plants will sell well if display plants carry good flowers. Prickly foliaged plants do not sell well in the nursery trade although they may appeal to some collectors, for example the species *Grevillea dielsiana* and *G. georgeana*. In the long term it is the market place that will sort them out no matter how much hype is involved with their introduction. The future for *Grevilleas* looks promising because better hybrids are starting to appear. Grafting has increased the range of good species available and better results will be achieved with better production methods and a greater genetic variation for the production of hybrids.

Parentage of some hybrids:

G. 'Austraflora Bon Accord'	G. <i>johnsonii</i> x G. <i>wilsonii</i>
G. 'Billy Bonkers'	G. <i>nana</i> ssp. <i>abbreviata</i> x G. 'Sid Cadwell'
G. 'Boongala Spinebill'	G. <i>bipinnatifida</i> x G. <i>caleyi</i>
G. 'Butterscotch'	Unknown
G. 'Coastal Sunset'	G. <i>banksii</i> (red) x G. 'Golden Yul-lo'
G. 'Coconut Ice'	G. <i>banksii</i> (white) x G. <i>bipinnatifida</i> (green foliage)
G. 'Cooroora Cascade'	G. 'Golden Lyre' – F2
G. 'Dot Brown'	G. <i>banksii</i> x G. <i>pteridifolia</i>
G. 'Firesprite'	G. <i>longistyla</i> x G. <i>venusta</i>
G. 'Flamingo'	G. 'Geisha' – F2
G. 'Geisha'	G. 'Superb' x G. <i>whiteana</i>
G. 'Goldilocks'	G. <i>bipinnatifida</i> x G. <i>juncifolia</i>
G. 'Golden Lyre'	G. <i>formosa</i> x G. 'Honey Gem'
G. 'Golden Yul-lo'	G. 'Sandra Gordon' – F2
G. 'Honey Gem'	G. <i>banksii</i> (red) x G. <i>pteridifolia</i>
G. 'Honey Wonder'	Variegated sport of G. 'Honey Gem'
G. 'Ivanhoe'	Unknown
G. 'Jester'	G. 'Coconut Ice' x G. 'Honey Gem'
G. 'Joy'	G. 'Long John' – F2
G. 'Lime Spider'	Variegated sport of G. 'Honey Gem'
G. 'Long John'	G. <i>johnsonii</i> x G. <i>longistyla</i>
G. 'Majestic'	G. 'Pink Surprise' – F2
G. 'Misty Pink'	G. <i>banksii</i> (red) x G. <i>sessilis</i>
G. 'Moonlight'	G. <i>banksii</i> (white) x G. <i>whiteana</i>
G. 'Ned Kelly'	G. <i>banksii</i> (red) x G. <i>bipinnatifida</i> (glaucous foliage)
G. 'Orange Marmalade'	G. <i>glossadenia</i> x G. <i>venusta</i>
G. 'Peaches and Cream'	G. <i>bipinnatifida</i> x G. <i>banksii</i>
G. 'Philomena'	G. <i>bipinnatifida</i> x G. <i>banksii</i>
G. 'Pink Ice'	G. <i>crithmifolia</i> (pink) or G. <i>levis</i> x G. <i>zygoloba</i>
G. 'Pink Midget'	G. <i>leiophylla</i> x G. <i>humilis</i> ssp. <i>maritima</i>
G. 'Pink Surprise'	G. <i>banksii</i> (red) x G. <i>whiteana</i>
G. 'Red Hooks'	Unknown
G. 'Robyn Gordon'	G. <i>banksii</i> (red) x G. <i>bipinnatifida</i> (green foliage)
G. 'Poorinda Royal Mantle'	G. <i>laurifolia</i> x G. <i>wilsonii</i>
G. 'Sandra Gordon'	G. <i>pteridifolia</i> x G. <i>sessilis</i>
G. 'Simply Sarah'	G. <i>beadleana</i> x G. <i>longifolia</i>
G. 'Strawberry Blond'	Possibly G. <i>aspleniifolia</i> or G. <i>caleyi</i> x G. 'Sandra Gordon'
G. 'Strawberry Sundae'	G. <i>bipinnatifida</i> x G. <i>banksii</i>
G. 'Sunset Bronze'	Unknown, one possible parent G. 'Honey Gem'
G. 'Superb'	G. <i>banksii</i> (white) x G. <i>bipinnatifida</i> (green foliage)
G. 'Sylvia'	G. 'Pink Surprise' – F2
G. 'Tango'	G. <i>bipinnatifida</i> (glaucous foliage) x G. <i>formosa</i>

Look-a-like Grevillea! The parentage gives a guide to similar plants, with the biggest variation being flower colour. The *Grevillea* 'Robyn Gordon' look-a-likes, all with *Grevillea banksii* dominant, are mentioned on page 235; the *Grevillea* 'Sandra Gordon' look-a-likes have *Grevillea pteridifolia* dominant, all tall shrubs. The colour photographs here will help. Editor.

Propagating *Grevillea* from Seed

Neil Marriott

For many years it has been known that *Grevillea* seeds are highly unreliable and erratic in their germination. Sometimes seed germinates well, but often it is very poor or comes up over several (often many) months. I have been growing *Grevillea* by seed for many years now, and have finally developed a process that gives almost 100% success. I do not use any fungicides as they are too dangerous*. You can use them if you wish, but by sticking to the following steps you should not need to:

1. Peel a few of the seeds to check their condition – healthy seed should be pure white or creamy-white in colour. If the seed is yellow or brownish it normally means the seed is old and/or not viable.
2. Soak seed in a jar of warm water for approximately 24 hours. Tap down any seed that initially floats. Seed that refuses to sink is not viable and should be discarded.
3. After 24 hours add the required amount of REGEN 2000 Smoked Water concentrate, as per the instructions on the bottle. N.B. There are numerous other brands of smoked water concentrate around that should be as good.
4. Soak for a further 12 hours.
5. Sterilise seed trays by pouring boiling water over them.
6. Make a sterile seed mix of 3 parts Perlite to 1 part sieved peat moss. Moisten with clean tap water, then firm and level the mix into trays till the trays are just over half to two thirds full.
7. Sow the soaked-and-smoked seed thinly over seed mix, then cover the seed with at least 1 cm of the same mix. Water in well. I have discovered that *Grevillea* seed germinates far better when sown deeply in the mix.
8. Place seed trays outside in a sunny site and well off the ground, e.g. on an old table etc. Protect from heavy rain with shade cloth.
9. Check moisture level of mix and water as required. Normally, this means daily watering with a fine rose. Never allow the tray to dry out or all seed will be lost.
10. I find mid to late spring to be the best time to sow seed in Victoria. This allows seedlings to be potted up and well-established by the following autumn. Autumn sowing gives as good results, but many seedlings can be lost through the first winter if they are not well developed by the time the cold weather arrives.
11. Potting mix used is an open good quality commercial composted pine bark mix with added slow release fertiliser.
12. Most species of *Grevillea* have an in-built dormancy factor that prevents germination when night minimum temperatures rise above 15° C.

* The Australian Plants Society supports this policy. The Society also supports the use of Coir (see page 246) in potting mixes rather than peat.

Propagating Grevillea by Grafting

Phillip Vaughan

The topic of grafting *Grevillea* species, particularly onto certain rootstocks, is one which has had broad discussion, sometimes quite heated. The range of views of the grafters is as wide as the requirements of the vast number of species that have been attempted in the quest to introduce this diverse group of plants into cultivation.

The simple answer is that everybody has got it right to a certain extent. Firstly we all have differing soil requirements and as such have our own preferences for the favoured rootstock. This however is only a small part of the picture. A successful graft does not always make for the desired plant in the long term. Problems incurred along the way may include incompatibility in its many forms. This can be as simple as the graft not forming a union that is both strong and aesthetically pleasing to the eye. Or it can be as complex as the long term structure and growing of the specimen that was initially desired.

Grevillea robusta, a long-time favourite rootstock, particularly in Queensland, is easily obtained, grows well from seed and accepts many scions to varying degrees. This would seem all you would need to grow those plants that don't do well on their own roots. But *G. robusta* has many problems. It does not grow well in the long term in many areas of low nutrient soils without significant summer watering and feeding. It goes dormant in the cold and sometimes long southern winters. It shoots from below the graft union which can create both bulging and misshapen trunks. It also promotes elongated growth due to exaggerated internode spacings, producing 'gawky' plants. So it is not the long term answer to cultivating more than a handful of species if you live south of Sydney.

In the last 6-8 years there has been much experimentation with using alternate rootstocks. These have mainly been hybrids as the advantages here are numerous. There are vast quantities of these to try and the choice needs to be made from those that are easily struck from cuttings, have hybrid vigour, grow well in a range of soils, and don't have a long winter dormancy. Certain hybrids have shown a marked improvement in the overall shape of grafted plants. Shortened internode spacings make for much denser growth habits and generally more impressive flower displays. The hybrids don't seem to have the shooting below the union problems of *G. robusta*. But perhaps the most important feature is the range of species which are now proving to be, so far at least, compatible with these new rootstocks in the garden situation.

While these developments have proved exciting, no one hybrid grows well in all conditions. Northern humidity and increased rainfall in summer can cause problems for both rootstocks and scions. Rootstocks for alkaline soils are an area where much work needs to be done. Soil-borne fungal diseases still cause concern with the growing of the hybrids, and the price of grafted plants, from a commercial point of view, is still a restriction to many people though recent advances with cutting grafts may be a breakthrough. So it would appear that no one rootstock is the answer, even in any one given area for every species desired for the garden. The answer is experimental trialling, constructive discussion, credit where it is due and an open mind.

Coir

Saving peat ecosystems _____ Cathy Offord, Sally Muir and Joanne Tyler*

The problem with peat

This study arose from the need to replace peat in potting mixes at Mount Annan Botanic Garden and to address wider concerns about the use of peat in a range of horticultural practices. Peat has long been used as an organic component of potting mixes because of its excellent physical and chemical attributes. In recent years, however, there has been world-wide concern over the large-scale use of peat because it is considered to be a non-renewable resource, mined from what are often fragile and endangered ecosystems. Peatlands are rare in Australia, but they serve the same functions as elsewhere, providing habitat for flora and fauna, nutrient recycling and streamflow regulation. One such area is the Wingecarribee Swamp south-west of Sydney, the home of rare species like *Gentiana wingecarriensis* and part of the catchment for the Sydney and South Coast water supply. This area was mined for the mushroom composting and potting mix industries.

Peat substitutes

There are a number of products used as peat alternatives including composted hardwood sawdust, crop trash, pine bark and more recently sewerage sludge, food waste, and green-waste from garden, nursery and municipal sources. There are still difficulties with supply of some of these materials. Coir (coconut mesocarp) has long been considered a potential peat alternative, as it is a renewable product, in fact a by-product of the rope and mat-making process. It is imported into Australia under the aegis of the Australian Quarantine Inspection Service and is increasingly being used in potting mix formulation. Although many of its properties are similar to peat, it cannot be substituted directly for peat before taking some of its differences into account. The main purpose of our study was to compare the growth of a range of Australian native plant species in coir and peat-based mixes.

Propagation trial

We compared the effect of one peat and two coir propagation mixes on the propagation of *Pultenaea parviflora* cuttings under mist (Table 1). The 'control mix' was our then current propagation mix made from German sphagnum peat, perlite and sand (4:7:3 v/v). The 'coir mixes' were coir, perlite and sand at 4:7:3 (coir 1) and 3:7:3 (coir 2). No significant differences were detected in the strike rate of the cuttings in any of the mixes. There was noticeably more root growth in the mix with the greater proportion of coir (coir 1) than in the other two mixes. The physical and chemical attributes of the mixes were different, but were mostly within the acceptable range as defined by the Australian Standard for 'seedling mix' (AS 3473-1996). The exception was pH, which initially was low in all mixes but increased over time in the coir mixes to acceptable values.

Continued on page 270

*A summary of work published in the *Australian Journal of Experimental Agriculture* 38, 879-87 (1998).

Cinderella Grevillea

Neil Marriott

What is a "Cinderella" Grevillea?

Poor little Cinderella was the neglected sister who was overlooked, before being discovered as the beautiful princess! There are numerous beautiful *Grevillea* that have been neglected, overlooked or are simply unknown to the nursery industry. In this paper I will discuss but a few of these *Grevillea*, my hope being that gradually (not too gradually, I hope) some, if not all, will be taken on by the nursery trade. A number are still proving to be difficult to propagate or grow, so will most likely only ever be available at specialist native nurseries. However, a good number are now readily propagated and grown and, as a result, should become available with time to the general public. It is up to us all to promote the better plants in our wonderful Australian flora, and push our nurseries to stock them.

If your local native plant nursery doesn't stock the plants you are after, keep pestering them until they finally get the message. Otherwise, find a new nursery! For each species or hybrid discussed I will give a brief description as well as its cultural requirements and how to propagate it.

Grevillea acerata – Gibraltar Range Grevillea. This lovely small Grevillea is a hardy plant tolerating summer humidity, full sun to semi-shade and frosts. It develops into a rounded shrub to 1 x 1 m and has dense small green leaves, with attractive terminal grey, brown and pink flowers for many months of the year, peaking in spring. Propagation is easy from cuttings and it also sets numerous seeds. Photo on page 249.

Tip: Advice from an experienced grower who has seen all species in the wild.

Grevillea aquifolium – Mt. Richmond form. Originating from wet sandy areas around Mt. Richmond National Park in south-west Victoria, this distinct form is now presumed extinct in the wild. Most of the area where it grew has been cleared for farming, and the last known colony in a roadside gutter has been destroyed by roadwork. Growing to around 2 m x 2 m, this is a large and dense screen plant. It has deeply lobed, shiny-green, holly leaves and toothbrush flowers that open yellow before turning red with age. As a result it is a most showy garden or public amenity plant. The fact that it grows in wet soils makes it a hardy plant for similar sites in the garden, but also means that it is probably not adapted to drought conditions. Introduced by the Grevillea Study Group in the 1980s but now unknown in cultivation.

Grevillea arenaria ssp. *canescens* – Gilgandra form. A distinct form that probably warrants separation as a new subspecies. Occurring naturally in Gilgandra Nature Reserve, this is a lovely rounded silver shrub to 1 m x 1 m, with soft grey leaves and showy large green/red flowers. It suckers lightly and makes a delightful foliage contrast shrub for sunny to semi-shaded sites over a wide climatic range. It prefers a well-drained soil. Propagates readily from cuttings. Photo on page 280.

Grevillea aspera – Gawler Range form* is a distinct form that will be raised as a new subspecies. It grows on very dry, stony hills where it suckers to form low colonies up to 1 m high and 1–2 m wide. Foliage is simple grey-green to blue-grey, and the showy red and yellow-green flowers are pendulous. This is an excellent low plant for harsh dry to stony soils. Difficult to strike from cuttings unless fresh sucker growth is used. Photo, page 256.

Grevillea bipinnatifida – low forms. This species has been readily available for decades, though the forms that are normally cultivated are quite inferior to several of the new dwarf forms introduced in recent years by the Study Group. One of these has a semi-prostrate habit, glaucous grey leaves and large red to orange and red flowers. It grows in damp gravelly soils near Boystown* north of Perth. Another hails from the Chittering Valley* and has a low, spreading habit to 0.5 m x 1 m, with very large pendulous orange and red flowers. Both forms set large quantities of seed that germinate readily. Seedling grown plants develop lignotubers and are very hardy, growing in full sun to semi-shade. They prefer a reasonably well-drained soil, but there are grafted plants available for other soils. Photo of both forms on page 253.

Grevillea buxifolia ssp. *buxifolia* – Grey Spider Flower. A common plant in cultivation for many decades but try and buy one today! For some reason it has faded from the nursery scene, despite the fact that it is one of the most interesting of our *Grevillea* species and is probably responsible for the common genus name of "spider flowers". An open shrub to 1.5 m x 1 m with simple grey-green leaves, it is the flowers that make the plant so interesting. These are terminal and of a curious grey colour, like woolly grey spiders. However they have a pleasantly pervading perfume that no spider has!! Easy to strike by cuttings, it also sets numerous seed. It prefers a well drained sunny to dappled shade site, and responds to annual pruning to maintain a good rounded habit.

Gardener's Tip:
Grevillea
species have
characteristic
flower head
shapes. This is
one of the spider
flower heads

Grevillea calliantha – Black Magic. The species name *calliantha* means 'beautiful flower', and this aptly describes the multi-coloured pendant toothbrush flowers (photo on front cover). A beautiful combination of black and orange, the flowers are produced profusely beneath the pinnately divided grey-green leaves. Before it was described as a species it was sold as *Grevillea* 'Black Magic'. It strikes well from cuttings, and is quite hardy in a sunny to semi-shaded site. It does not appear to be fussy about soil type so long as it is reasonably well drained. It also sets large seeds that germinate readily.

Grevillea chrysophaea – decumbent form. Unknown in cultivation until collected on the Study Group Crawl to Gippsland, but known to locals. It is a low spreading semi-prostrate shrub to 0.3 m x 1 m with shiny green leaves and beautiful bright gold clusters of flowers. It occurs naturally in the Holey Plains State Park, southwest of Sale, Victoria, in grey sand over gravelly loam. Photo on page 256.

***Editor's note:** It is important to be able to distinguish these desirable forms when purchasing them. It is suggested that they be given a 'cultivar' name.



Grevillea acerata

See page 247

N. Marriott



Grevillea magnifica* ssp. *remota

See page 251

N. Marriott



Grevillea juncifolia* x *eriostachya

'Rawlinson Flame'

See page 250

N. Marriott

Grevillea crowleyae – Darkan Grevillea. Discovered by Thelma Crowley, a member of the Grevillea Study Group, this wonderful *Grevillea* is closely related to *Grevillea calliantha*. However it has far softer foliage and more uniformly black flowers, and makes a more rounded medium to large shrub from 1–2 m x 1.5–2 m. It is proving to be extremely hardy and reliable in the garden, and warrants far more widespread cultivation.

Grevillea fastigiata – Jerdacuttup River Grevillea. This is a medium to large dense green shrub from 1–2 m x 1.5–2 m with profuse orange to red toothbrush flowers for many months of the year. Introduced into cultivation in the 1980s by George Lullfitz, from Perth, this species is nowadays rarely available from nurseries. It strikes reasonably well from cuttings and grows strongly in the garden given a well drained sunny to dappled shade site. Photo on page 252.

Grevillea flexuosa – Zigzag Grevillea. This wonderful *Grevillea* has been available in specialist nurseries since its introduction by the Grevillea Study Group in the early 1990s. However plants have only been available grafted onto *Grevillea robusta*, the Silky Oak. These develop into open spindly rather ugly shrubs, with little merit for the broader nursery trade. With the advent of smoked water treatment of seed and the use of alternative root stocks, *Grevillea flexuosa* is now revealing its true beauty. It is a very fast growing plant, forming a bushy shrub 2–3 m x 2–3 m, with attractive large divided zigzag leaves. The massed display of rich creamy-yellow cigar shaped flower spikes are truly spectacular, filling the garden with a delicious caramel perfume. On its own roots it is hardy in all but the heaviest or poorly drained soils. Grafted plants on 'new' rootstocks are needed for these soils. Photo on page 257.

Grevillea irrasa ssp. *irrasa* – Yowaka Grevillea. Only recently described, this beautiful *Grevillea* was introduced into cultivation following a Study Group crawl through the south coast region of NSW. Found on dry stony hillsides inland from Pambula, this is a medium to large shrub from 1–3 m x 1.5–3 m with lovely soft felted foliage, showy pink new growth and massed terminal pendulous reddish-pink flowers. It is extremely hardy in cultivation, surviving extended dry conditions and even growing well underneath trees. It strikes readily from cuttings and looks attractive when not in flower. Photo page 277.

Grevillea juncifolia x *eristachya* – *Grevillea* 'Desert Gold' and *Grevillea* 'Rawlinson Flame' would have to be the most floriferous *Grevillea* cultivars I have ever seen. *Grevillea* 'Desert Gold' was discovered by Phillip Vaughan and myself on a trip up the Great Central Road in WA. Phillip has introduced it into cultivation. It is a large, bushy shrub to 2 m with massed orange flowers intermediate between the two parents. Photo on page 249.

Grevillea 'Rawlinson Flame' was discovered by Peter Olde and myself on a trip to the Rawlinson Ranges earlier this year. It is an erect grey-leaved shrub with spectacular long orange flower spikes on leafless branches above the main plant. These are so bright that the plants stand out from hundreds of metres away. Unfortunately the material we brought back has failed to propagate, so another trip will be required!! However it is such a stunning *Grevillea* that it will be worthwhile. As both these *Grevillea* cultivars come from the centre of Australia they need to be grafted onto rootstocks suitable for wherever they are to be grown. Photo on page 249.

Grevillea spinosa x *eristachya* – 'Canning Classic'. This superb natural hybrid was first found on the Canning Stock Route by Peter Olde, Merv Hodge and myself in 1988, but material brought back failed to survive. Fortunately Phillip Vaughan and John Cullen went back and re-collected several forms, the best of which Phillip has introduced into cultivation. A classic *Grevillea*, it has a distinctive layered look that should work well in bold landscapes. It has huge terminal orange-yellow toothbrush flowers and soft grey-green divided leaves. One of our very best small *Grevillea*, it only grows to around 1–1.5 m.

Grevillea magnifica ssp. *magnifica* and ssp. *remota* – Granite Pink Poker *Grevillea*. Both these *Grevillea* subspecies are robust erect large shrubs confined to granite outcrops and their surrounds in the central and southern wheatbelt of WA. The subspecies *magnifica* is the smaller of the two growing to 3 m with attractive glaucous stems. The subspecies *remota* (photo on page 249) is a very large shrub with its flower spikes reaching to 10 m high!! It is an extremely fast growing shrub that varies slightly in flower colour from population to population. It is easy to grow in most soils, but probably doesn't like cold wet conditions. It has great potential as a distinctive accent plant for large landscapes. Both subspecies have proven to be difficult to successfully graft, but strike well from cuttings and germinate readily from seed.

Grevillea masonii – Mason's *Grevillea*. Named in honour of *Grevillea* Study Group member Dave Mason, this compact leafy shrub comes from the Grafton region in northern NSW. It forms a small to medium sized shrub with soft light-green leaves and masses of delicate red and green flowers. It is not common in the nursery trade despite its attractive habit and pleasing, if not spectacular, flowers. It is hardy to summer humidity and poorly drained soils, stays rounded and neat and requires little maintenance. It strikes readily from cuttings. Photo on page 252.

Gardeners tip.
Some *Grevillea*
have flowers
singly usually
on small
undershrubs,
ideal for small
birds.

Grevillea maxwellii – Pallanup River *Grevillea*. Re-discovered by Peter Olde after having been presumed extinct for over 100 years since it was first collected by George Maxwell. This is another *Grevillea* with a distinctively layered habit that should have considerable potential in bold landscapes to accentuate the horizontal line. Material sent back by Peter was introduced into cultivation by the *Grevillea* Study Group in the late 1980s. Unfortunately it is now very uncommon in cultivation. It is a most attractive *Grevillea* with fine, deeply divided non-spiny leaves and orange-red pendant flowers. These hang beneath the branches in a massed display. Because of this flowering habit it should be planted high up in a bed or on the top of embankments, where its flowers will be readily seen. It strikes easily from cuttings.

Grevillea oleoides – Avon Dam form. This form of *Grevillea oleoides* grows in riparian communities, often right in the bed of the seasonally flowing creeks and rivers in this area south of Sydney. It is a compact, dark-green leaved shrub to 1 m x 1 m with massed red to bright pink flowers. It was introduced into cultivation by the *Grevillea* Study Group in the 1980s but has never gained the popularity that it deserves. With its ability to withstand periods of inundation and waterlogged soils in the wild, it should be a most adaptable plant in cultivation. Add to this its compact habit, showy flowers and ease of propagation and you have a perfect Cinderella plant.



Grevillea fastigiata
Jerdacuttup River Grevillea
See page 250 N. Marriott



Grevillea masonii
See page 251 N. Marriott



Grevillea bipinnatifida
'Whittering Valley'
See page 248

N. Marriott



Grevillea bipinnatifida
'Boystown'
See page 248

N. Marriott

Grevillea polybotrya – pink flowered form. Any form of this beautiful Western Australian *Grevillea* is worthy of one of the prime sites in your garden, also for its perfume alone – rich caramel!! The pink form is the best, with its massed display of pink flowers that fade to cream with age. These contrast beautifully with the ashy grey soft leaves, creating a memorable sight. Growing to around 1.5–2 m x 1–1.5 m it requires well-drained soils and a sunny site. Not suited to widespread cultivation, its ease of propagation by cuttings should ensure that it becomes a regular with specialist nurseries. Unfortunately it has so far proven to be almost impossible to graft.

Grevillea polybractea – dwarf form. From a limited area in the upper Murray River region of Victoria, this lovely small *Grevillea* was introduced into cultivation by Grevillea Study Group member Don Weybury. It has soft oval leaves, and masses of dense heads of furry orange and crimson flowers. Growing to 0.5 x 0.5 m in sunny to semi-shaded sites, it has much to offer. It strikes fairly easily from cuttings and is hardy to dry conditions once established.

Grevillea rhyolitica – 'Deua Flame'. From a recently described species, 'Deua Flame' was first introduced into cultivation in the early 1990s by Mt Annan Botanic Gardens. In these gardens it has grown into a dense rounded shrub to 1 m x 1 m with massed large pendulous red flowers all year round. It is happy growing in sunny to semi-shaded sites and with its attractive soft oval leaves it has great potential for widespread cultivation. In the wild it grows up to 2 m. It is only now making its way into the nursery trade, but it is such a good *Grevillea* that I predict it will soon be widely available. This will be further enhanced by its ease of propagation by cuttings. Photo on page 277.

Grevillea sericea – Blue Mountains form and 'Lawson Giant'. Both of these forms of the Silky *Grevillea* come from the Blue Mountains to the west of Sydney. They grow into open shrubs to 1 m x 1 m with a massed display of showy flowers. In the Blue Mountains form they are a rich pink to mauve-pink, being noticeably larger and brighter than lowland forms of the species. In the 'Lawson Giant' they are even larger, and a spectacular mauve-purple colour. 'Lawson Giant' was introduced into cultivation by Study Group member Pip Gibian. Both forms sucker once established, but unfortunately 'Lawson Giant' is proving to be a little touchy to poor drainage in cultivation. However given a well drained sandy soil it becomes a wonderful garden plant. Grafted plants are now being produced for those without sandy soils. Both forms strike readily from cuttings. Photo on page 257.

Gardener's Tip:
Widely known in the Sydney area as the Pink Spider Flower. There are many forms

Grevillea sericea ssp. *nova* from the Western Slopes of NSW. Of uncertain origin. This wonderful compact *Grevillea* has developed into one of the most attractive small shrubs in the Grevillea Park, Bulli, NSW. It was planted out as the Murrumbo Gap form, however a thorough search of this location by Peter Olde and myself last year failed to locate this form there. It forms a dense rounded shrub 0.5 – 0.8 x 1 m, with a massed display of showy pink flowers. It is closely related to *G. sericea* (Pink Spider Flower) but the pistil length is rather short for that species and it has finer leaves than is typical. Habit is also not typical. It is proving to be hardy and adaptable, including tolerance of summer humidity, and it strikes easily from cuttings.

Grevillea speciosa – Red Spider Flower. A Sydney *Grevillea* introduced into cultivation in the 1800s. It is a spectacular shrub, growing to around 1 m x 1 m with dark green oval leaves and massed spidery red flowers. It strikes readily from cuttings and is quite hardy given a well-drained site in sun to semi-shade. A low growing form collected by Study Group member Ray Brown has grey-green leaves, a free-flowering compact shrub 0.5 m x 1 m.

Grevillea williamsonii – Serra Grevillea. Presumed extinct for a hundred years, this extremely rare *Grevillea* was introduced into cultivation by members of the Grampians Australian Plants Society Group. In the wild it is a small shrub to 1 m x 1 m, but in cultivation it is a robust dense shrub to 1.5 m x 2–3 m wide. The dainty small toothbrush flowers open yellow-green before turning orange and then finally red. They may be small but they make up for their size by creating an absolutely massed display of multi-coloured flowers. In cultivation it is proving to be extremely hardy in a range of conditions including dry sites, and grows happily in full sun to semi-shade. It strikes readily from cuttings. Its hardiness makes it suitable as a dense low screen plant for public and private areas.

Conclusion

This is far from an exhaustive account of *Grevillea* species with great horticultural potential that deserve wider support from the nursery trade. However, it provides readers with a list of some of the best *Grevillea* species that they should look out for. It will be noted that many, if not most of these *Grevillea* species, have been introduced into cultivation by Society members or by *Grevillea* Study Group members. There are many wonderful new *Grevillea* species out there in the wild just waiting for observant collectors to find. Keep your eyes open when out in the bush, and if you find a plant that you feel has merit, collect some cuttings* or let a Study Group member know about it. Who knows, you may find a *Grevillea* that will become a future garden favourite! This is why we, as growers of our wonderful Australian flora, must fight to save all that is left of our natural areas. Without them we are all the poorer.

* It is important to comply with the law so check with the land owner / manager first.

Grevillea, cultivation and descriptions _____ Editors note.

397 species and subspecies of *Grevillea* are described and illustrated in colour in the three volumes of *The Grevillea Book*, see inside our rear cover for purchasing. Now less expensive and an invaluable reference. The books will never be out of date as new research and species will be published in *Australian Plants*.

Cultivation? Volume one of *The Grevillea Book* has a whole chapter on cultivation, garden preparation, planting, mulching, watering, fertilising, disorders, pruning and growing in containers. This is followed by a table with 24 pages with a line for each of the 397 species and subspecies, and for each subspecies. Appropriate ticks in 63 columns headed variously for bush habit, foliage, consciousness of flowers and colour, preferred soil type, bird and insect attraction, propagation, ease to grow, and geographical areas highly recommended for cultivation give a comprehensive reference.

It is a vast accumulation of knowledge by Peter Olde and Neil Marriott, both recognised as current authorities on the genus *Grevillea*.



Grevillea chrysophaea
(Gippsland form)

See page 248

N. Marriott



Grevillea aspera
'Gawler Range'

See page 248

N. Marriott



Grevillea sericea* ssp. *nova

'Lawson Giant'

See page 254

N. Marriott



Grevillea flexuosa

See page 250

N. Marriott

Illawarra Grevillea Park

And Ray Brown - A Dream Becoming Reality _____ W. H. Payne.

The Grevillea Study Group, under the drive of enthusiasts such as Peter Olde and Merv Hodge in the early 1980s, was very active. They linked up with Ray Brown of Bulli, a wholesale nurseryman with a love for Grevilleas and a magic touch when it came to propagating. Visitors to the NSW Society's major flower show in the Sydney area were stunned by the display of Grevilleas growing in pots. These were grown and kept in Ray's nursery but it was evident that there could be no real progress until they were in the ground.

At this time Peter Olde met up with Neil Marriott of Victoria, also an exceptionally competent propagator and grower of Australian plants with an eye for Grevilleas among others. Their close association with a botanist from the Royal Botanic Gardens Sydney, Don McGillivray, led to the publication of *The Grevillea Book* in three volumes, a magnificent achievement.

Meanwhile Ray Brown, the achiever, had encouraged the Wollongong City Council to make available a large site near the bottom of Bulli Pass. With this start and no money, Ray managed to fence the area and install a watering system, roads, drainage and an assembly of huge rocks. The business people of the Bulli - Wollongong area knew Ray as an achiever because of other community projects so, while it did not come easily and only in small lumps, they provided support, some with money but most with materials and resources. The Australian Plants Society in NSW provided grants.

Typical of the alertness of Ray, the chance timing of the LEAP scheme for the unemployed and a decision by Wollongong City Council to replace tonnes of paving blocks in the city area, resulted in extensive paved areas and paths at Illawarra Grevillea Park. It sounds easy but work of this kind required continuous supervision and a high level of practical landscaping, skill and vision. Ray's nursery business suffered but the Park rapidly developed.

While the work on the books and construction of the Park continued, the Society arranged to meet some of the expenses involved in the collection of wild source *Grevillea* cutting material in Western Australia. Thanks to the dedication of John Cullen, thousands of cutting specimens began arriving with first preference going to Mount Annan Botanic Garden. Duplicate material went to Ray Brown, Paul Nixon and David Mason. This created a *Grevillea* collection of outstanding scientific value. Much of the fresh material was used for grafted specimens, principally onto Silky Oak, *Grevillea robusta*. The scheme would not have been so successful but for the generous contribution of resources made available at Mt Annan and their help meeting the freight costs.

The Illawarra Grevillea Park is now a spectacular reality enjoyed by thousands of people since its creation. The Park still relies upon the hard work of Ray Brown and a small band of helpers. The plant collection of the Prostanthera Study Group is also maintained there and a rainforest area receives attention from the Rainforest Study Group and the Fern Study Group.

Hybrid Grevillea

Suitable for growing in semi-arid regions of Australia

Sarah Carruthers*

Grevilleas make an attractive addition to any garden and have possibly become the most popular genus of Australian native plants growing in our backyards. They are fast growing, have an amazing variety of both leaf and flower forms and colour, they flower for a long time and, perhaps most importantly, require little care. Hybrid grevilleas can often have attributes that many of their parents lack as garden plants. These attributes can include drought resistance, frost tolerance and prolific flowering throughout the year.

Many of the more stunning hybrids available often can't tolerate the harsh, dry conditions of semi-arid regions. With land clearing still continuing at a rapid rate it is also important that a garden be capable of contributing to the survival of many of the smaller animals and birds that are losing their food sources and nesting sites. The Directors of Myall Park Botanic Garden Ltd are continually trying to conserve biodiversity within the garden. With the help of members from the Gold Coast branch of Society for Growing Australian Plants - Queensland Region, a trial of hybrid *Grevillea* was undertaken to find plants that support increasing numbers and variety of wildlife in your backyard. The trial has been running for four years and has so far included over 20 hybrid Grevilleas.

The trial was specifically designed to look at both the survival rate of the hybrids and their ability to support fauna within a garden. Any hybrids that had a 75% survival rate or over and also showed the potential to increase wildlife numbers and variety by providing nesting sites, food or shelter, have been recommended. Myall Park Botanic Garden is in a semi-arid region, having an average rainfall of 578 mm and mean minimum and maximum temperatures of 6.3°C and 34.2°C respectively. However, it is not uncommon for summer temperatures to reach over 40°C accompanied with strong hot winds during the day. Although the Garden is 25 metres higher than the surrounding land, freezing cold nights with heavy frost occasionally occur in winter. For these reasons the hybrids that have been recommended are all either frost-tolerant or frost-resistant and are drought tolerant.

Myall Park Botanic Garden was, originally, the garden of the late Mr. Dave Gordon, a revered pioneer of the horticultural development of the Australian flora. He introduced into horticulture *Grevillea* 'Robyn Gordon', *Grevillea* 'Sandra Gordon', and *Grevillea* 'Merinda Gordon', named after his daughters. The garden is located in a woodland region of Southern Queensland, near Glenmorgan.

You may visit this garden by appointment, phone (07) 4665 6855. What is lacking in polish due to critical financial constraints is compensated for in plant display. Congratulations must go to the band of dedicated workers. The Society, especially the Gold Coast Branch, have worked consistently over the years to maintain this garden. Would you like to join this work and have a short holiday on site? Contact the Secretary, phone (07) 5539 1593, email adonalds@austarnet.com.au. Editor

*Sarah Carruthers was caretaker for a period.

Right:
Grevillea 'Forest Rambler'
See page 263 N. Marriott



Below:
Grevillea 'Coastal Glow'
See page 262 N. Marriott



ght:
revillea juniperina x alpina
oorinda Splendour'
e page 263 N. Marriott



elow:
revillea
ustraflora Canterbury Gold'
e page 262 N. Marriott



Hybrid Grevilleas were all planted in close proximity to one another (1–2 m apart) on free-draining gravelly red laterite soil. Several plants from each of the hybrid varieties were also planted in raised beds to further aid drainage. All Grevilleas received full sunlight and had no protection from wind or frost.

Each newly planted juvenile *Grevillea* was protected from kangaroos by wire caging. Plants were mulched to a diameter of 40 cm and 7–8 cm thick, and watered once a fortnight in winter and once a week at other times.

Hybrid Grevilleas included in the trial were: *G. 'Austraflora Fanfare'*, *G. 'Austraflora Canterbury Gold'*, *G. 'Coastal Glow'*, *G. 'Poorinda Splendour'*, *G. 'Forest Rambler'*, *G. 'Bronze Rambler'*, *G. 'Barklyana X'*, *G. 'Poorinda Royal Mantle'*, *G. juniperina 'Molonglo'*, *G. 'John Evans'*, *G. 'Star Fire'*, *G. 'Honey Gem'*, *G. 'Misty Pink'*, *G. 'Big Red'*, *G. 'Copper Rocket'*, *G. 'Flora Mason'*, *G. 'Magic Lantern'* (not a hybrid but a naturally occurring form known as *Grevillea preissii* ssp. *glabrilimba*)*, *G. 'Sunrise'*, *G. 'Tango'*, *G. 'Ned Kelly'*, *G. 'Poorinda Elegance'* and *'Stephen'*, *G. 'Moonlight'* and *G. 'Winparra Gem'*.

After minimum growth periods of eighteen months the plants were evaluated for survival rates, growth rates, flowering length and profusion, frost tolerance and an ability to provide good food sources, shelter and nesting sites for birds and animals. The following are recommended:

Grevillea 'Austraflora Canterbury Gold' (*G. juniperina* prostrate yellow x *G. parvula* (was *G. victoriae* var. *leptoneura*) is a compact semi prostrate *Grevillea*, growing to 80 cm high x 2 m wide, and has small elliptical furry grey green leaves and tiny golden spider flowers. It has been pruned into a round shrub and with a little attention a number of plants would make a wonderful low-growing hedge. Photo on page 260.

Grevillea 'Bronze Rambler' (parentage unknown) has a growth form befitting its name. The new growth is bronze in colour and it is a prostrate hybrid with branches that will spread just about anywhere. It grows 30 cm high and up to 5 m wide. The flowers of 'Bronze Rambler' are a red toothbrush-like raceme and, by flowering all year round, make this hybrid not only an attractive plant but great for attracting birds to your garden.

Grevillea 'Barklyana X' (*Grevillea barklyana*) Unlike its only known parent *G. barklyana* which needs shelter and moisture, this hybrid is frost resistant and seems to cope quite well in harsh conditions. *G. 'Barklyana X'* has serrated two-toned foliage - silver on the underside and deep green on top. Honeyeaters love the nectar from the pink 'toothbrush' flowers.

Grevillea 'Coastal Glow' (*G. barklyana* x *G. aspleniifolia* or *G. longifolia*) has inherited the best possible features from its parents with two-toned foliage as seen in *G. barklyana* and deep crimson toothbrush-like racemes that are in profusion throughout the year. Because this plant flowers all year it will attract all types of honey-eating birds, insects and butterflies throughout the year. This hybrid grows rapidly to a 3 m x 3 m shrub in about 2 years making it great as a screening plant. Photo on page 260.

Grevillea 'Forest Rambler' is a dense shrub that benefits greatly from tip pruning after each flowering. It has creamy-pink spider flowers. Because of the pale colour, birds are not always attracted to this plant but small insects and ants certainly are. The abundance of small insects helps attract many lizards and geckos to the garden. Photo on page 261.

Grevillea 'John Evans' (*G. baueri* x *G. rosmarinifolia* 'Nana') is a low growing compact shrub of 1 m x 1 m at full size, producing fire engine red flowers in clusters along the stem, a brilliant contrast to the deep green foliage. It has proven very hardy as it has, on numerous occasions, recovered and flowered within two weeks of being stripped almost bare by kangaroos.

Grevillea 'Poorinda Royal Mantle' (*G. laurifolia* x *G. willisii*) is another prostrate *Grevillea* and only reaches a height of 20 cm. This hybrid is a dense ground creeper and is very useful when planted to help prevent erosion within the garden as it spreads well on sloping ground. At Myall Park Botanic Garden it has been planted on the edge of raised beds. This hybrid is very similar to *G. 'Coastal Glow'* with two-toned foliage and red toothbrush racemes, which flower prolifically throughout the year.

Grevillea 'Poorinda Splendour' (*G. juniperina* x *G. alpina*) is a compact cone-shaped shrub that may grow up to 2 metres. It has brilliant deep crimson red spider flowers and dark green foliage making it very showy from a distance. Like *G. 'Austraflora Canterbury Gold'*, *G. 'Poorinda Splendour'* would make a great brightly coloured hedge. Photo on page 261.

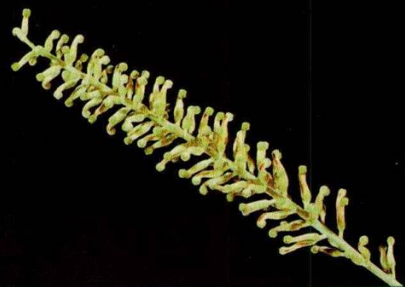
Every one of the hybrids recommended is capable of individually enhancing the beauty of your garden. Creating a layered effect within your garden by planting prostrate, small shrubs and tall erect *Grevillea* hybrids in the one area, may help establish a paradise for honeyeaters, butterflies, insects and small reptiles and mammals.

The hybrids in this recommendation are by no means the only hybrid *Grevillea* that will thrive in a semi-arid region. They are, however, a great place to start.

With special thanks to:

Lynne and Peter Reilly, who are friends of Myall Park Botanic Garden and Gold Coast SGAP Members, for their time and advice, all the Gold Coast SGAP members who supplied the plants and labour, Nita C. Lester, Director Myall Park Botanical Garden, for her helpful advice and support and Jane Carruthers for the photographs.

Editor's note: The Society is involved in the formation and maintaining of many gardens around Australia; conservation in a practical way. If you are interested in volunteer work, contact the Secretary of the Society for your state. Contact details are listed inside our rear cover.



Stage 0 Immature ✕



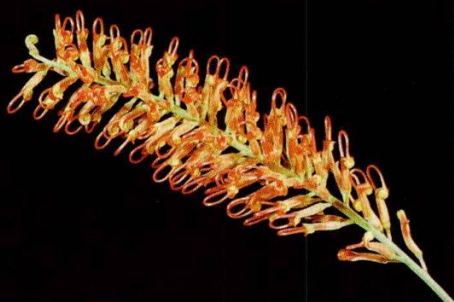
Stage 1 Perianth splitting



Stage 2 Early looping



Stage 3 Late looping ✓



Stage 4 Fully looped



Stage 5 Over mature ✕

Stages of flower development of *Grevillea* 'Sylvia'

Flowers to be harvested at 'late looping' stage. They may develop only one further stage after harvesting. Further research is needed.

Reproduced from *Cutflower characteristics of terminal flowering tropical Grevillea* by P. R. Beal *et al*, Australian Journal of Experimental Agriculture 39, 781-794 (1999).

Grevillea for cut flowers _____ Peter Beal

A preliminary investigation by the CSIRO and Queensland Department of Primary Industry (QDPI) by D.C. Joyce, P.R. Beal and A.J. Shorter (1996) surveyed 58 *Grevillea* accessions in controlled vase life conditions. Fifteen had a vase life exceeding 7 days and up to 9 days, in water. This was greater than the 5–7 days vase life previously experienced. It was also greater than a notional lower acceptable limit of 7 days. Thus genotypes likely to be useful in cut flower production and/or for breeding, have been identified. Joyce and Beal (1999) have since reviewed the prospects for future development of terminal flowering *Grevillea* as cut flowers and consider that they have real prospects.

The stages of flower opening of *Grevillea* 'Sylvia' are shown opposite and in the table below. The flowers should be harvested in the 'late looping stage'.

Flower stages		Vase life
0	'immature'	7.5 (97%)
1	'split perianth'	7.4 (96%)
2	'early looping'	7.5 (97%)
3	'late looping'	7.7 (100%)
4	'fully looped'	5.9 (77%)
5	'overmature'	4.7 (61%)

Values in brackets show relative vase lives (in days) compared with the longest recorded in this study (%)

References

- Beal P.R., Howell J., Joyce D., and Shorter A.J. (1995). Maturity stages for harvesting *Grevillea* for cut flowers, Dept. of Primary Industries Qld Pub. QL95007.
- Joyce D.Q., Beal P.R., and Shorter A.J. (1996). Vase life characteristics of selected *Grevillea*, *Australian Journal of Experimental Agriculture* 36, 379–82.
- Joyce D.Q. and Beal P.R. (1999). Cut flower characteristics of terminal flowering tropical *Grevillea*, *Australian Journal of Experimental Agriculture* 39, 781–794.

Editor's note. The introductory work of Peter Beal and his team will be the basis of further research as described on the next page.

Developing *Grevillea* as cut flowers

New Research*

Peter Abell and Peter Olde

Excluding subspecies, forms and cultivars, there are at least 360 species of *Grevillea*, some as yet undescribed. Having evolved in many forms and occupied a diversity of environments in this continent and a few places overseas, they have been voted as arguably the most popular horticultural plant in Australia. Their flowers are often dramatic and colourful, often delicate, a number are scented, and there is a great diversity in flowering times.

Apart from some servicing of local markets, *Grevillea* flowers are rarely successfully sold domestically or exported into the international cut flower trade. It is often not possible to cut enough floral racemes with sufficiently long stems for a vase arrangement. The inflorescences wilt if kept out of water for any period of time and usually do not recover or mature in the vase. In most species, the flowers of cut stems drop their perianth quickly and, also, are too fragile to pack in bulk for transport. Numerous studies have shown that the vase life of *Grevilleas* rarely exceeds 7 days. There is a small market for the foliage of *Grevillea baileyana* and as there exists a great range of shapes, colours and textures in other *Grevillea* species, one can expect similar opportunities to open up for them. The aims of the project include:

1. To improve protocols for cut flower production of *Grevillea* varieties.
2. To produce or develop lines incorporating the following traits that will provide answers to the deficiencies in the current *Grevillea* cultivars as used in the cut flower industry: longer stem length, greater floral production, improved range of flower colours, resistance to perianth drop, improved vase life and resistance to transport damage.
3. To demonstrate the commercial viability of *Grevillea* as cut flowers.
4. To breed PBR protected cultivars suitable for the cut flower trade. A spin off here may be landscape or horticultural varieties.
5. To investigate improved methods of cultivation, such as grafting and nutrition, to produce better plants for both commerce and horticulture.

This project's aim is to improve the post harvest performance of existing varieties and breed improved cultivars in a range of colours suitable for the cut flower trade and exhibiting longer stem length, greater floral production, resistance to perianth drop, improved vase life and resistance to transport damage. The cultivars will have improved agronomic traits suitable for commercial production.

*Rural Industries Research and Development Corp (RIRDC) will fund this project to be conducted by The University of Sydney, Plant Breeding Institute in association with the ASGAP *Grevillea* Study Group and the Royal Botanic Gardens Sydney



The project will initially survey and locate the available gene pool using the resources of the University of Sydney Plant Breeding Institute, the ASGAP Grevillea Study Group (GSG) and the Royal Botanic Gardens Sydney at Mt Annan. It will concentrate on assessing the pool for the traits important to the project by:

- establishing an IN-SITU collection of selected lines from which to trial and select.
- examining HORTICULTURAL PRACTICES, such as fertilizer regimes, pruning methods, grafting vs. own stock studies, stem production, planting design and densities. The effect of soil types, pH etc, will also be examined. Juvenile plants will be replicated for parallel assessment of flowering time, stem production, response to fertilizer application, and post harvest damage.
- studying FLOWER production parameters, such as flowering time, duration of flowering, colour, form, stem length and yield.
- assessing the components contributing to POST HARVEST QUALITY AND LONGEVITY such as vase life, resistance to handling, bunch profile and packaging strategies.
- conducting a directed BREEDING PROGRAM using, as parents, selected lines exhibiting characteristics contributing to the goals of the project.
- introducing MOLECULAR MARKER STUDY as the project develops to assist in distinguishing traits in the juvenile stage.

The *Grevillea* cut flower industry is currently constrained by a limited range of cultivars exhibiting a number of performance deficiencies. Our investigations have shown that the tropical hybrids currently used in the industry are generally unsuited to cutflower production, except for their floral display. These hybrids include *Grevillea* 'Majestic', 'Moonlight', 'Honey Gem', 'Sandra Gordon', 'Pink Surprise', 'Sylvia' and 'Golden Yul-lo'.

Breeding and selection for the cutflower trade will improve the product yield and quality. Agronomic studies will improve production techniques that target improved yield, post-harvest issues and reduced costs of production. Specifically bred *Grevilleas* will introduce this crop into the mainstream of the cutflower trade in Australia. The popularity of purpose bred cutflower *Grevillea* varieties will expand the market from its current 'cottage industry' state to a self-sustaining, competitive domestic market that will have the capacity to supply an export trade.

Agronomic:
consideration in
relation to the
economic
aspects of
agriculture.

There is no doubt about the potential for the crop as the uniqueness of the *Grevillea* inflorescence in the garden landscape has made *Grevillea* one of the most popular garden, or horticultural, plants in Australia and in many parts of the world. Once the problems of the cut flower have been overcome we anticipate a revolution in the use of *Grevillea* by the floral industry.

Overseas demand for Australian floricultural products is increasing. The five year forecast for increased exports by region is: North Asia 9% p.a., South Asia 15%, Europe 6%, North America 8% and Other markets 10%. Strong demand predictions have been received from the Japan Cutflower Importers' Association (JCIA) for the next decade.

It is anticipated that the greatest benefit from this project will be for cut flower growers but there will be a significant increase in knowledge about nutrition and cultural practices that will benefit a great many people who grow and love Grevilleas. Furthermore, new hybrids not suitable to the floristry industry but of great horticultural merit will be released into the landscape/nursery trade.

For such a broad project to have initial success it was determined that a large base of expertise was needed. The Grevillea Study Group's (GSG) leader, Peter Olde, was approached with the idea of industry-based support coming from the group. It was accepted and the added contribution from the Royal Botanic Gardens means the project has a strong base from which to operate. The experiences and expertise from these three groups will combine to make a significant contribution to the general knowledge of the culture of *Grevillea* as well as helping them become part of mainstream floristry.

Preliminary review for Grevillea breeding and development project

by Ms W. Coppin, Technical Officer, Plant Breeding Institute, University of Sydney

Literature was widely sourced to produce a foundation for future research.

A database was compiled of *Grevillea* species that displayed potential for use in this breeding and development program. Data was sourced from literature, growers, floral specialists and researchers. Floral, foliage and agronomic attributes were considered.

A survey of 400 members of the ASGAP Grevillea Study Group (GSG) and two cutflower groups which brought responses from almost every state in Australia and a few from overseas indicated that:

- *Grevillea* has the potential to become a more popular cut flower (97%).
- Vase life/wilting was the greatest postharvest problem (76%), followed by flower perianth drop (43%), discolouration (3.4%) and uniformity (3.4%).
- Other problems mentioned were: bent stems, short stems, lack of terminal flowers on some species, propagation, parrots destroying flowers, root disease (*Phytophthora* spp.) and *Grevillea* leaf miner. Over half of respondents (55%) wanted to be further involved in this project.

A vase life trial was conducted in November 2000, at Illawarra Grevillea Park, Bulli, NSW. The flowering stems of eleven *Grevillea* species/cultivars were harvested and trialed for vase life in either 'Chrysal' vase solution or water. From this trial the following results were obtained:

- Chrysal extended the vase life of ten of the eleven species/cultivars tested.
- *G. sericea* subsp. *sericea* displayed the longest vase life (12.75 days) and demonstrated good potential for use as fill in flower arrangements.
- *G. linearifolia* also displayed potential for use as fill, though this species had a vase life (8.5 days) much shorter than *G. sericea* subsp. *sericea*.
- *G. 'Fire Sprite'* (*G. longistyla* x *G. venusta*) demonstrated potential as focal fill with larger showy flowers and an acceptable vase life (9.25 days).

Potting mix trial A range of Australian plants were potted into one of four potting mix formulations (Table 2) which were pH adjusted and contained added nutrients. The plants were grown for 14 months under 50% shade. One group of plants was heavily watered (e.g. watered twice a day in summer, once a day in winter) or watered lightly (e.g. once a day in summer, every second day in winter). There were 15 replicate plants of each species in each of the potting mix/watering treatments.

Table 1. Physical and chemical characteristics of cutting mixes (mean $\pm$ se) and the Australian Standard for Potting Mixes (AS 3743-1996) and root and shoot growth of *Pultenaea parviflora* cuttings grown in those mixes (from Offord *et al.* 1998).

Property	Cutting mix treatment			Aust. Std 'Seedling mix'
	Peat - sand/perlite (4:10)	Coir - sand/perlite (4:10)	Coir - sand/perlite (3:10)	
AFP (%) - initial	11.9 $\pm$ 0.6	9.9 $\pm$ 0.4	14.5 $\pm$ 0.5	8-15
- 8 weeks	11.2 $\pm$ 0.2	9.0 $\pm$ 0.5	13.5 $\pm$ 1.0	
WHC (%) - initial	54.6 $\pm$ 0.7	60.6 $\pm$ 0.7	57.1 $\pm$ 0.9	$\geq$ 50
- 8 weeks	57.7 $\pm$ 1.7	55.0 $\pm$ 6	58.5 $\pm$ 3.2	
pH - initial	4.4 $\pm$ 0.05	3.3 $\pm$ 0.02	3.9 $\pm$ 0.01	5.3-6.5
- 8 weeks	4.6 $\pm$ 0.02	5.8 $\pm$ 0.03	5.6 $\pm$ 0.2	
EC (dS.m ⁻¹) init.	0.040 $\pm$ 0	0.253 $\pm$ 0.003	0.127 $\pm$ 0.003	$\leq$ 1.5
- 8 weeks	0.093 $\pm$ 0.006	0.095 $\pm$ 0.004	0.103 $\pm$ 0.008	
Cuttings root.%	31	30.5	31.0	
Shoot regrowth rating (1-5)	1.8	1.9	2.0	
DW roots (mg)	6.9	13.4	7.6	
Root lth. (mm)	139	155	140	

Table 2. Mixes used in potting mix experiment on a range of Australian plants

Treatment	Component (volume ratio)		
	Peat	Coir	Sand
Mix 1	1	-	2
Mix 2	-	1	2
Mix 3	-	1	3
Mix 4	-	1	1.5

Few differences between peat and coir mixes were found in the growth of plants as indicated by shoot dry weight (Table 3). The main differences were between the watering regimes and, as this was not consistent across the taxa used in the comparison, the only conclusion that can be made is that the plants have different water requirements that may be satisfied by selecting the appropriate mix formulation/watering regime. For example, *Brachyscome multifida* var. *dilatata* had equally good shoot growth in coir and peat under the high watering regime, but had comparatively poor growth under the low

watering regime. Conversely, *Callicoma serratifolia* grew relatively better in the low watering regime. The physical and chemical properties of the mixes were very similar, generally within the Australian Standard with the exception of **Water Holding Capacity** (WHC), which was at or just below (Table 4).

Root growth was generally superior in the coir mixes with the roots distributed throughout the pot.

Table 3. Dry weight (mean) of shoots in four potting mixes under two watering regimes for 14 months (from Offord *et al.* 1998).

Species	Light water regime				Frequent water regime			
	Mix 1	Mix 2	Mix 3	Mix 4	Mix 1	Mix 2	Mix 3	Mix 4
<i>Brachyscome multifida</i>	15.3	16.6	16.3	-	18.2	18.0	17.0	-
<i>Callicoma serratifolia</i>	66.9	66.7	-	58.2	58.3	58.5	-	54.8
<i>Correa</i> 'Dusky Bells'	48.6	48.1	53.6	-	49.2	52.3	57.2	-
<i>Eucalyptus melliodora</i>	50.0	48.0	48.5	-	48.5	53.3	47.6	-
<i>Grevillea gaudichaudi</i>	73.5	66.8	61.0	-	53.8	59.3	55.8	-
<i>Lomandra longifolia</i>	54.2	67.3	-	54.8	56.9	66.4	-	59.7

Table 4. Physical and chemical characteristics of potting mixes (mean $\pm$ se) one week after commencement of experiment (from Offord *et al.* 1998). The Australian Standard for Potting Mixes (AS 3743-1996) is presented for comparison.

Property	Potting mix treatment				Australian Standard 'Other Mixes'
	Mix 1 (peat:sand 1:2)	Mix 2 (coir:sand 1:2)	Mix 3 (coir:sand 1:3)	Mix 4 (coir:sand 1:1.5)	
Air filled Porosity (%)	15.4 $\pm$ 0.6	14.9 $\pm$ 0.3	17.2 $\pm$ 0.3	15.3 $\pm$ 0.4	> 13
Water Holding Capacity (%)	37.6 $\pm$ 2.5	35.6 $\pm$ 0.9	32 $\pm$ 1.7	41 $\pm$ 2.1	> 40
pH	7.2 $\pm$ 0.02	7.3 $\pm$ 0.06	7.4 $\pm$ 0.09	7.6 $\pm$ 0	5.3–6.5
EC (dS.m ⁻¹)	0.54 $\pm$ 0.02	0.75 $\pm$ 0.02	0.684 $\pm$ 0.03	0.82 $\pm$ 0.02	< 2.2

Conclusion

Coir can be substituted for peat in propagation and potting mixes as long as care is taken to adjust the mix formulation so that it is within the Australian Standards for horticultural mixes as well as for the particular species' needs. Coir has now been substituted for peat in mixes used at Mount Annan Botanic Gardens for more than seven years, with no adverse effects observed to date.

Tips for using coir

Coir sometimes comes in a compressed form. Soak the tablet in water for half an hour and then break it up, avoiding breathing the fine airborne particles. Ensure that the coir is low in salt by purchasing washed coir, or wash it through thoroughly before use, as salt will have a detrimental effect on plant growth. Coir has a greater WHC than peat, so it may be possible to reduce its proportion in a mix by up to 5% of that in an equivalent peat-based mix. It is not necessary to use lime in coir mixes as coir has a higher pH than peat. Coir mixes may draw down a small amount of nitrogen, although much less than with pine-bark mixes, so they still need a little addition of nitrogen.

Euclid CD

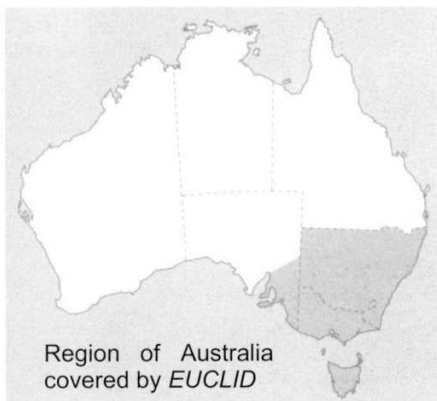
Eucalypts of South-eastern Australia

A review by W.H. Payne

Can you imagine having a reference in full colour of all 324 *Eucalyptus* species found in the south-eastern area of Australia, all of NSW, Victoria and Tasmania, and the south-east of South Australia.

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The price of the Euclid package is \$130 from CSIRO Publishing, PO Box 1139, Collingwood, Victoria, 3066, phone 1800 645 051 (free call).

New *Grevillea* cultivars

W. H. Payne

***Grevillea* 'Sunset Splendour'** was trademarked as *G. 'Sunset Bronze'*. Thought to be a seedling of *Grevillea* 'Honey Gem' and the north Qld. form of *G. pteridiifolia*, it is an open shrub 3–4 m tall, spreading to 2–3 m, the grey-green leaves pinnately divided into 10–18 linear lanceolate sub-opposite lobes 2–4 mm wide, 60–110 mm long; overall leaf length 23–30 cm; upper surface dull green, 139A, lower surface greyed red, 192B. Flowering is almost throughout the year, the flowers a deep burnt orange in terminal crowded cylindrical inflorescences 9–16 cm long; perianth (greyed orange 168D grading to red 46A) 11–12 mm long, 3–4 mm wide; limb bright yellow, 7A; pistil 33–36 mm long; ovary sessile, covered in dense white semi-appressed hairs; nectary prominent, bright yellow, with a margin of deeply incised triangular lobes; style glabrous, greyed orange, 168A, shortly curved above the small pollen presenter. Suitable only for warm climates. Photo opposite.

***Grevillea* 'Ladelle'**, trademarked as *G. 'Pink Flush'*, is believed to be a first generation seedling of *G. 'Misty Pink'*. A shrub to 5 m, spreading to 4 m, flowering is almost continuous throughout the year. The foliage is open, leaves pinnately divided into 7–9 sub-opposite lobes overall length 11–17 cm. Young leaves grey-green on the upper surface, with semi-appressed white hairs most shed on maturity. Mature leaves are dark green on the upper surface, 139A, the lower surface greyed green, 192B, with dense silvery white hairs. Flowers occur in terminal crowded cylindrical inflorescences 11–15 cm long x 5 cm diameter, flower colour pink (63D-B grading to 63A); limb covered in dense, erect wavy white hairs; pistil 32–38 mm long; ovary sessile, covered in dense flattened white hairs; nectary prominent, burgundy in colour, with a prominently scalloped margin; style (red-purple 63A-C) glabrous with a prominent hoof-like pollen- presenter. This Cultivar is distinguished from *Grevillea* 'Misty Pink' and from *Grevillea* 'Sylvia' by the deeper colour of the flowers. It is suitable for warm climates only. Photo opposite.

***Grevillea* 'Winter Sparkles'** is an F1 hybrid of *Grevillea banksii* x *pteridiifolia*, a tall, moderately dense, pyramidal shrub 5–6 m tall and 2–2.5 m wide, leaves pinnate 14–25 cm long, 7–18 cm wide with linear lobes 5–15 cm long. Upper surface glabrous, green; lower surface silvery white due to fine silky appressed white hairs. Flowers June–September in erect terminal inflorescences, 12–15 cm long, 4–6 cm wide; bracts linear to lanceolate, orange-yellow on inner surface; perianth 5 mm long, 4 mm wide; pistil 27 mm long, ovary sessile, densely hairy with long silky white hairs, style glabrous, pollen presenter lateral, stigma prominent. The plant has denser foliage than *Grevillea pteridiifolia* and *G. 'Honey Gem'*, and is taller than *G. banksii*. The flower colour, 23A, is slightly more orange than *G. 'Sandra Gordon'*. It is drought hardy and very attractive to parrots. Photo opposite.

***Grevillea* 'Woori Wanderer'** is believed to be a hybrid between *Grevillea laurifolia* and *G. acanthifolia*, prostrate spreading to 2.5 m, foliage dense, new growth reddish. Flowers are red (style red-purple 60A; stigma 151A; perianth with red or white hairs 61A–60D). Flowers October–December and March. Leaf shape is the same as *G. laurifolia*, with foliage similar to *G. x gaudichaudi* interspersed among the *G. laurifolia*-like leaves. Hardy.



Grevillea 'Sunset Splendour' F. Mazzaferri
Australian National Botanic Gardens collection



Grevillea 'Ladelle' F. Mazzaferri
Australian National Botanic Gardens collection



Grevillea 'Winter Sparkles' E. J. Morgan
Australian National Botanic Gardens collection

Flindersia oppositifolia, Mountain Silkwood.

This rare, small tree is restricted to Mt. Bellenden-Ker and Mt. Bartle Frere in north Queensland growing in well-developed tropical rainforest and also the stunted rainforest of the summits of these mountains. It forms a small tree from 10–15 m high with a grey trunk. The leaves may be simple or trifoliate with elliptical leaflets to 8 cm long. Oil dots are visible with a lens. Panicles of red flowers are borne terminally and in the upper axils in late spring. The large, prickly fruit capsules are up to 11 cm long, greenish turning brown on maturity. The seed is winged at both ends to 4 cm long. This tree is too small for use as timber but makes an excellent ornamental plant. My plant is an open specimen, 5 m high in 11 years, flowering each year in November and December with attractive fruits that mature about September. The red flowers are pleasing. It is grown in almost full sun in well-drained loam.

Flindersia pimenteliana, Rose Silkwood, Red Beech.

This species occurs in well-developed rainforest from sea level to 1300 m in north Queensland and extends also to Papua New Guinea. It is a large tree reaching 35 m high with a spreading crown. The trunk is greyish brown with small, rough protuberances. The shiny, pinnate leaves have 3–11 leaflets and may be opposite or alternate. Each leaflet is elliptical to ovate with an unequal-sided base and is about 10–15 cm long. Oil dots are few and should be viewed with a lens. The panicles of deep red flowers are borne terminally in spring and early summer. The brown or green capsules are prickly, with long protuberances, and are up to 11 cm long. The seeds are winged at both ends and up to 6 cm long. This fast growing tree yields a valuable pink-coloured timber used for cabinet making and indoor panelling. It should be grown in wood lots as far south as the sub-tropics. My trees in Coffs Harbour are 18 years old and have reached about 20 m in deep loam, flowering in December each year. Fruits have not been seen. This species makes a beautiful shade tree for parks, rural properties, or avenue plantings.

Flindersia schottiana, Bumpy Ash, Cudgerie, Silver Ash, Mountain Ash.

Other common names are Northern Silver Ash, Southern Silver Ash, Ash, Wyageri. With a wide distribution, from the rainforests of north Queensland to northern NSW as far south as Port Macquarie and also extending to Papua New Guinea, this very large tree may reach 40 m. It occurs from near sea level to 1000 m. The trunk has protuberances along its length where branches have fallen, giving its common name of bumpy ash. Small pustules are also visible. The large, opposite leaves are up to 50 cm long and very dark green. The 8–16 leaflets are oblong and up to 20 cm long with sparse oil dots visible with a lens. Hairs are sometimes seen on the underside. Huge panicles of white flowers are borne terminally or in the upper axils in late spring and summer. The prickly fruit capsule is brown and up to 13 cm long, splitting into five segments when mature. The seed is winged at both ends and about 6 cm long. The timber is subject to uneven shrinkage and care must be taken to season the wood properly for use in indoor fittings. The wood is durable and was used by settlers for shingles. It has also been used for oars. Flowering is spectacular and street plantings have been seen to flower in about 7 years. It is fast growing, an excellent shade tree for parks.

Flindersia xanthoxyla, Yellow Wood, Long Jack.

Found in dry and sub-tropical rainforest from the Richmond River, NSW, to Gympie in southern Qld., this tall tree will reach up to 45 m with scaly, greyish-brown bark shedding in oblong pieces. The opposite, pinnate leaves are up to 30 cm long; yellow flowers occur in large terminal panicles in summer. The capsule is clothed in short blunt prickles and is up to 11 cm long, splitting into five segments when mature. The yellow timber was used for coach building and railway carriage frames and is still prized for cabinet making and joinery.

Farm forestry

A conservation project _____ notes by W.H. Payne

Rainforest Timbers for turning and Carving

continued from our September 2001 issue. Our March 2001 issue also gave very practical advice on plantation establishment.

Harpullia pendula, Tulipwood; yellow with dark brown stripes. Fast growing.

Litsea reticulata, Bollygum/wood; light grey-brown, flecked, for bending, slow.

Melaleuca acacioides, Wattle-leaf Paper Bark; brown.

Melia azedarach, White Cedar; light brown, striped. Fast growing.

Musgravea heterophylla, Briar Silky Oak; brown, densely flecked.

Myristica insipida, Nutmeg; pale grey, striped.

Neonauclea gordoniana, Hard Leichhardt; golden.

Nothofagus cunninghamii, Myrtle Beech; reddish-brown, striped.

Opisthiolepis heterophylla, Blush Silky Oak; light brown, heavily flecked.

Orites excelsa, White Beefwood, Prickly Ash; brown, flecked as in Silky Oak.

Palaquium galactoxylum, Red Silkwood; deep brown, striped.

Planchonella australis, Black Apple; yellow, hard, close grained.

P. laurifolia, Blush Coendoo; greyish-pink, striped.

P. pohlmaniana, Yellow Boxwood; yellow.

Pleiogynium timorense, Tulip Plum; black-brown.

Podocarpus elatus, Brown Pine; light pinkish-brown, streaked. Fast growing.

Premna lignum-vitae, Yellow Hollywood; yellowish to olive-green.

Pseudoweinmannia lachnocarpa, Rose Marara; pink, valuable. Fast growing.

Rhodospaera rhodanthema, Tulip Satinwood; golden-brown, striped.

Schizomeria ovata, White Birch; pink striped.

Sloanea australis, Blush Alder, Maidens Blush; pink darkening to brown, flecked, interlocking grain.

S. macbrydei, Grey Carabeen; cream.

S. woollsii, Yellow Carabeen; deep-pink, boldly striped. Fast growing.

Stenocarpus sinuatus, Firewheel Tree, White Silky Oak; similar to Silky Oak.

S. salignus, Scrub Beefwood, Red Silky Oak, like Silky Oak, slow growing.

Syncarpia glomulifera, Turpentine; brown.

S. hillii, Red Satinay; red.

Synoum glandulosum syn. *muelleri*, Seenthess Rosewood; deep red.

Syzygium francisii, Giant Water Gum; pinkish.

S. gustavioides, Grey Satinash; light brown.

Terminalia sericocarpa, Damson; light grey-brown, flecked.

Toona australis, Red Cedar; deep red-brown, streaked. Fast growing.

Tristaniopsis laurina, Water Gum; brown distinctly striped.

Villaresia moorei, Silky Beech; white with distinct stripes of greyish-cream.

Zanthoxylum brachyacanthum, Thorny Yellow-wood; bright yellow.



Grevillea 'Sylvia' N. Marriott
see pages 238, 243, 265 & 267



Grevillea 'Honey Gem'
see page 243

N. Marriott



Grevillea irrassa
see page 250

'Yowaka Grevillea'
N. Marriott



Grevillea rhyolitica
see page 254

'Yowaka Grevillea'
N. Marriott

Cycads of Australia

Book review by Editor

This is a magnificent book by Ken Hill and Roy Osborne, illustrated in beautiful colour by many photographers and produced with the support of The Australian Plants Society. All species occurring naturally in Australia of the four cycad genera (*Cycas*, *Bowenia*, *Lepidozamia* and *Macrozamia*) are described and illustrated in colour, both female and male plants. The sections on cultivation, economic uses, toxicity and conservation will be of interest.

The unusual forms of cycads, and their ability to survive harsh conditions, makes them excellent feature plants. Available from your bookstore for \$65.00, excellent value.

Wildflower Nurseries in Queensland

Fairhill Plants and Botanic Gardens — Huge range: rainforest plants, grafted grevilleas, rare plants, wildflowers, ferns, orchids, revegetation trees. Extensive display gardens. Open every day 8.30 a.m. to 5.00 p.m. Fairhill Native Plants, Fairhill Rd, Yandina, Qld 4561. Tel. (07) 5446 7088.

Nielsen's Native Nursery — Over 500 species including grafted grevilleas, eremophilas, eucalypts and brachychitons, also Foxtail Palms, cycads, rainforest, Bush Tucker plants. Display garden. Open 8.00 a.m. to 5.00 p.m. every day. 49-51 Beenleigh Redland Bay Rd, Loganholme, Qld 4219. Tel. (07) 3806 1414.

Wildflower Nurseries in New South Wales

Annangrove Grevilleas — 98 Annangrove Rd, Kenthurst 2156. Tel. (02) 9654 1380. Wide range of natives including hundreds of different species in tubes — many hard to get. Ten percent discount to APS members.

Bryants Native Plant Nursery — Cosy Camp Rd, Bexhill, NSW 2480. Tel. (02) 6628 4323. 15 kms north of Lismore. Open 7 days (from 11 a.m. on Sundays). Extensive range. Excellent quality and service.

Dealbata (cold climate) Aust. Plant Nursery — off Bloomfield St, Dalgely 2630. Tel. (02) 6456 5043. Specialising in alpine and dry Monaro plants — Sorry no overseas orders. Phone to arrange a visit.

Illawambra Native Growers — P.O. Box 89, Cobargo, NSW 2550. Tel. (02) 6493 7398, mail order specialist. Send 2 x 45c stamps for catalogue of our large range including rare species.

Newcastle Wildflower Nursery — 260 Lake Rd, Glendale 2285. Tel. (02) 4954 5584. Extensive range of native plants including rare and endangered species.

Stocks Native Nursery — Lot 3, Simmonds Rd, Harden, 2587. Tel. (02) 6386 2682. Plants for frost and dry weather suited to Canberra, Wagga Wagga, Orange type conditions.

Sydney Wildflower Nurseries — South at Heathcote (02) 9548 2818; West at Marsden Park (02) 9628 4448; North at Terrey Hills (02) 9450 1555. Excellent range of native plants. Open 7 days.

Wirrimbirra Native Nursery — Hume Hwy, between Bargo and Tahmoor E. side 2574 (3 km from Freeway entry). Wide range including unusual plants. Tel. (02) 4684 1112.

Wirreanda Nursery — End of Wirreanda Rd, Ingleside 2101. Tel. (02) 9450 1400. Growers of advanced and semi-advanced native trees and shrubs. Open 7 days.

Wildflower Nurseries in South Australia

Brenton Tucker Native Plants and Carawatha Garden — Placid Estates Rd, Wellington East via Taillem Bend. Tel. (08) 8572 7104. Wide range of tubestock and advanced plants. Extensive display gardens and picnic areas. Open weekends and public holidays March to November and by appointment, 10 a.m. to 4 p.m.

Wildflower Nurseries in Tasmania

Plants of Tasmania Nursery — 65 Hall St, Ridgeway 7054. SAE catalogue. Tel. (03) 6239 1583. Open 7 days.

Wildflower Nurseries in Victoria

Kuranga Native Nursery — 393 Maroondah Highway, Ringwood 3134. Tel. (03) 9879 4076. www.kuranga.com.au For Australia's largest range of Australian flora including rare and unusual forms. Delivery to most states. Free stock list on request.

Australian Wildflower Seed Suppliers

R. Horner — 1 Grundy St, Alice Springs, NT 0870. Seed of trees and shrubs of Central Australia. Please send a 45c stamp for a list.

Wildflower Society of Western Australia (Inc.) — PO Box 64, Nedlands 6909. A range of seeds available, labelled and packed, at \$1.50 (plus postage) per packet. Send for a **current** Descriptive Seed List (\$3.00 posted) to: The Seed Sales Officer, Eastern Hills Branch, PO Box 111 Glen Forrest, WA 6071. Also available a book *Hints on Growing Native Plants* (\$4.00 posted).

The Grevillea Book, volumes 1, 2 and 3 by Peter Olde and Neil Marriott, is a complete reference to all species of *Grevillea*. The Australian Plants Society NSW ensured that they were published to a very high standard with at least one large colour photograph of each of the 340+ species, an easily read description of each species and details of its occurrence and cultivation. They are available from the Australian Plants Society NSW, PO Box 744, Blacktown NSW 2148, at \$44 per volume plus postage and handling of \$7.50 for 1 or 2 volumes and \$15.00 for 3 volumes within Australia.

Australian Plants may be received by membership or subscription.

Membership: Contact the Secretary, listed below, of a Society.

Annual subscription: \$20.00 (A\$32.00 overseas) including postage to your address.

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Mail Order Book Service: Each Society listed below has a very wide range of books on Australian plants for sale, often at discount prices. Contact the Secretary for your requirements.

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Grevillea arenaria ssp. *canescens*

see page 247

N. Marriott