

Australian Plants

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Paralympics
bouquet on
page 349

Sydney 2000
Olympic Games
the winning athletes' bouquet

Australia is the lucky country — There is no doubt that this applies to the people in it. We have stable government with a 2/3 party system, and we trust them all regardless of minor political squabbles. This is a true democracy where freedom of action and speech is unparalleled elsewhere in the world. Our prosperity is shown at the Olympic Games sites. As with any free enterprise system with a sound social services backstop, there are some not so well off but prosperity prevails.

There are vast natural resources that have been exploited to achieve this high standard of living. However natural resources are not inexhaustible and the future world wide is not good. Let us manage our own unique continent properly before we look critically at others, see page 367. But Australia is not the lucky country, our continent is disintegrating to dust and salt!

Sydney 2000 Olympic Games — Our hospitality and concern for the beautiful are portrayed in the winners' bouquets displayed on the front and rear covers. The flowers are all our wildflowers, carefully selected developed and grown in plantations for decorating our landscapes and our homes. Visitors can look for them at their florists at home. Special thanks to Jamie Creer and his team at The Australian Flower Company, for their dedicated effort for Australia.

Paralympics — The games for the disabled that follow the contest of the fortunate. We regard them with awe and affection and extend an equal tribute to them. Their bouquet is shown on page 349. Special thanks to Craig Scott and the team at Australian Native Flower Growers and Promoters for such dedication.

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COVER PLATE. The Sydney 2000 Olympic Games winning athletes bouquet.

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The Olympic bouquet

Presented by Jamie Creer, The Australian Flower Company
This report is taken from the press kit prepared for the international media by
Heleen Moody with additions from the editor

The stunning Olympic medallists' bouquets at the Sydney 2000 Games consist entirely of native Australian flowers. They will not only enchant the athletes that receive them, they will show the beauty and uniqueness of Australian flora to a world-wide audience of billions.

Over 2000 identical bouquets will be presented to medallists during The Games, representing a massive logistics exercise in terms of both the supply of the flowers and production of the bouquets. The 12 varieties of flowers and foliage used in the bouquets have been carefully chosen to include some of the country's most spectacular flora, some of our best known cut-flower exports, and some very new and superior flowers that have been scientifically bred to meet the demands of the international market.

Aspects of Australian life are represented. The gumnuts in the skirting of the bouquet represent the corks that outback drivers tie on their hats to keep flies at bay. Classic gum leaves 'Skippy Whistle' and 'Joey Whistle' are included, for what Australian can't recall trying to blow on a gum leaf when they were a kid?

The bouquet has been carefully designed so that the colours and textures of each flower and foliage is complementary and that the shape and form of each is displayed. They show the vibrant yet earthy colours and textures of the Australian bush and send a message to the world about the nature and beauty of our flora. The design is deliberately irregular and a little rough, for that is the texture of the Australian landscape.

Australia has one of the greatest floral gene pools in the world, but it is only in the last decade that the true potential of our native flowers for the international cut-flower market has received recognition. Ten years ago most of the flowers that were exported were picked from the wild. Today the fresh flower export market is based on superior varieties that are grown on commercial plantations and nothing in these bouquets is bush picked.

The bouquets represent Australia, not just Sydney or NSW. Almost 50 growers from around Australia have supplied the flowers. Around 15 florists and assistants are involved in making the bouquets, and most of these have come from far afield to ensure that rural Australia has a role in producing the bouquets.

The huge number of flowers required to produce the bouquets represents a sizeable logistics exercise and required careful and long term planning. The Australian Flower Company, which won a competitive tender to supply the bouquets, is one of Australia's largest flower exporters, and, together with its corporate design division, Myriade de Fleurs, has spent two years designing the bouquet and planning the exercise.

Organizations that have supported this media kit include the Australian Plant Societies (four regional bodies and some district groups), plus grower groups in several states who see these bouquets as a way of exposing to the world the beauty of our flora and the flower export industry.



Paul Nixon

△ **Waratah in a garden.** Miss Lucile Pope shows her waratah selection that is now called 'Cardinal'. It is one of the flowers in the bouquet.

▽ ***Eucalyptus*, an Australian icon.** Later in this issue we show you in colour, some of our gems. Below are two of the three *Eucalyptus* species included for legend, 'Joey Whistle' (left), 'Skippy Whistle' (right), see page 343.





Gembrook Waratah



Telopea oreades

Neil Marriott

Waratah

Flowers in the Olympic bouquet

The waratah was chosen as the focal flower of the Olympic bouquet for its uniqueness, its distinctive beauty, its vivid colour, and its symbolic status. The waratah features in many Aboriginal legends, it stunned the first white visitors to Australia, and for many Australians it embodies a spirit of place. A waratah is actually a head of up to 250 crimson or scarlet florets, the heads measuring up to 15 cm diameter, that sits in a whorl of coloured bracts.

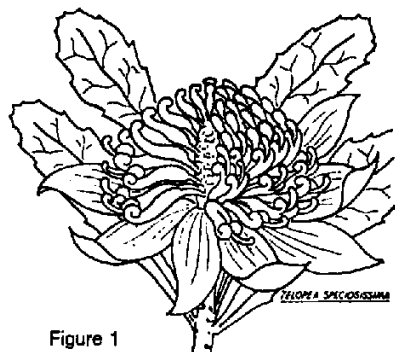


Figure 1



Figure 2



Figure 3

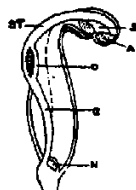


Figure 4

A - Anther; S - Stigma; ST - Style; O - Ovary;
G - Gynophora; N - Nectary

Figure 1. A waratah flower head with one quarter removed, the individual flowers opening first at the base. **Figure 2.** Flower in bud the four petals tightly folded to form a tube bent at the top. **Figure 3.** Flower maturing, with the style emerging out the back. **Figure 4.** Botanical details of a flower in section.

The NSW waratah, *Telopea speciosissima*, (tel-O-pe-a spes-EE-o-SISS-ee-ma) is the New South Wales floral emblem. It grows in the wild along the south central coast of NSW and inland to the Great Dividing Range. Flowering period starts in August in northern locations and finishes mid to late November in southern, elevated, cooler regions.

In the bush it appears only in particular localities, growing on extremely well drained and very infertile soils. Too much rain, too little rain, a particular pest or a bad season, and bushes will fail to flower. Like many Australian natives, the waratah has the ability to recover after a bushfire, shooting readily from underground stems known as lignotubers, flowering at their best after fire.

It is not an easy plant to domesticate. Despite much research and the selection of a number of improved forms, commercial cut-flower growers must still cope with its precise drainage and fertilizer requirements.

The waratahs in the bouquet will include a number of new cultivars such as 'Fire and Brimstone', 'Cardinal' and the 'Gembrook' Waratah.

The **Gembrook Waratah** is a seedling form selected in 1982 by Victorian cut-flower grower, Ausflora Pacific. The bush was selected from 15,000 seedling-produced waratah plants for its vigorous growth and the bright green leaves. Its precise genetic makeup is not known, but it is assumed to be a natural hybrid of *T. speciosissima* and *T. oreades*, the Gippsland (Victoria) waratah (photograph on page 333), with the former predominating, but with sufficient of the latter to enable it to grow in a greater variety of soil conditions and to give it longer vase life. *T. oreades* grows in wetter country than the NSW waratah and becomes a taller tree with smaller, less compact flowers.

Waxflowers

Waxflowers are in the genus *Chamelaucium*, a native to Western Australia. *Chamelaucium uncinatum* (cam-ee-LAW-she-um un-CIN-ate-um) is the most widely cultivated of the 31 species for cut flowers. The flowers in the wild vary from white to pink as shown on page 353.

Less than a decade ago much of the waxflower that was sold commercially was bush-picked, but today most export quality flowers are cultivated on plantations. The waxflower industry is located predominately in Western Australia, but flowers are now grown in other states. Cutflower exports to Japan in 1998 were 9 million stems, 55% from WA, 15% from Victoria and 15% from Queensland.

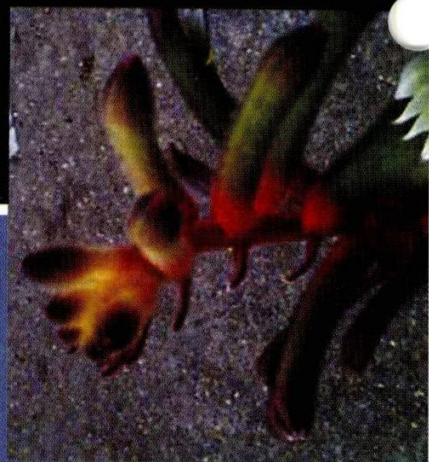
Today waxflower is widely sought on the international cut-flower market. It is used mainly as a filler flower in floral arrangements, available 12 months of the year, with Israel and California producing counter seasonally to Australia. This means growers either have to produce in very high volumes for small margins, or go for low volumes and top quality. Growers who chose the latter road must continually plant new varieties to maintain a price advantage.

Selection and breeding strategies aim at greater plant vigour, branching and floriferousness, superior flower colour, larger flower size, longer stem length, longer vase life and easier cultivation. New varieties are fast-growing, vigorous shrubs pruned hard annually to maximize flower production.

A decade ago most commercial plantings of waxflower would all come on stream in a short, intensive period from mid August to early October, creating huge harvesting and handling pressures and limiting export opportunities. Today it is important for growers to extend their marketing season to meet international demand. Much of the breeding work aims to produce early and late flowering varieties, and as it is also grown in different locations wax flower can be marketed from May to December.

'**Mega White**', photograph on page 344, is the waxflower chosen for the Olympic bouquets, *Chamelaucium* 'Mega White', is a natural hybrid between *C. megalopetalum* and *C. uncinatum*. A number of these hybrids have been commercialized, and this one, discovered by Steve Peters of Caroor in Western Australia has large clear white open petals with a greenish centre and large shiny bulbous buds.

Anigozanthus manglesii its majestic parent



△ *Anigozanthos* 'Bush Gam'



Anigozanthos 'Bush Haze'



Anigozanthos 'Yellow Haze'

Flannel flowers

Flannel flowers are in the botanical genus *Actinotus* and can be found in various forms in all states, the species *Actinotus helianthi* (ak-tin-O-tus hel-EE-anth-i) is the most popular and is attracting much attention in Japan. A well-known member of the Sydney flora, its natural environment is sandy soils in coastal heaths and open forest. Even there it is a short-lived perennial, rarely living for more than four years. It appears in profusion after bushfire.

The leaves are an attractive soft grey-green and the whole plant is covered with soft woolly-white hairs. The main flowering season is September to December. What appears to be a flower with long-white flannel-like 'petals', is in fact a central flower head of closely packed flowers arranged in an umbel and surrounded by flannel-like bracts. (See the photograph on page 344 and figure 1 below.)



Figure 3

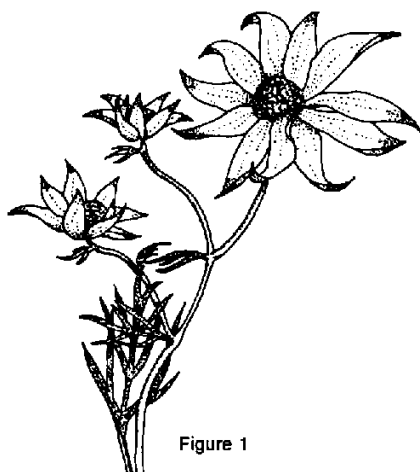


Figure 1



Figure 2

Figure 1 shows the flower heads. One of the 90–300 individual flowers is shown in **figure 2** and one of the tightly packed flower heads you can see are redrawn in **figure 3**; one of the cupping woolly sepals and stamens have been removed to show the remaining four stamens surrounding the two long styles.

Sketch by courtesy of Royal Botanic Gardens, Sydney, *Telopea* 8(4)2000. It is of a newly described species *Actinotus periculosus* that is very similar to *A. helianthi* differing only by having slightly narrower leaf segments and column as in figure 2–3 mm long rather than 1 mm long. It is found in the Springsure, Roma area of Queensland.

With their long stems, lovely colour, woolly texture and long vase life, flannel flowers make lovely cut flowers as well as being excellent pot and garden plants. To date most of the flowers picked for the market have come from the bush but recent research is developing reliable propagation techniques and cultivation systems. Little technology has been applied to large-scale cultivation that is severely restricted by availability of cheap seedlings and fungal disease.

Kangaroo paws

Kangaroo paws, botanical name, *Anigozanthos* (an-ig-O-zan-thos) are native to Western Australia, where they flower in spring and summer. They have been extensively developed for the cut-flower, landscaping and flowering pot-plant industries and are cultivated in most states.

Most cultivated plants are hybrids or selected clones that have been bred for better flower quality and colour, uniformity, extended flowering times, improved vase life, increased yields and disease resistance. There are hundreds of hybrids available. Breeding work is ongoing, as new and exciting varieties are required for the continued development of the export market in the face of increasing overseas competition. Both Israel and California produce large numbers.

The red and green paw *Anigozanthos manglesii* (photo page 336), is a popular species but it suffers from a disease of the leaves and dies off. Breeders have been trying for years to get the hardiness of the other species together with those vibrant red/green flowers. 'Bush Games' appears to be the answer.

'Bush Games' is a new arrival, and is named specifically for these Olympics. It is part a defined breeding program that has produced around 35 cultivars in the 'Bush Gems' series, bred for their hardiness as landscape plants or cut flowers. It is unique among the range. Most of the cultivars have just two parents, occasionally three, but 'Bush Games' has four parents (*Anigozanthos humilis* x *flavidus* x *manglesii* x *viridis*). Botanically that's getting pretty complicated, but what it means is that it has inherited parental characteristics that include vigour, an extended flowering season, multi-coloured red, yellow and green flowers, and unbranched stems, a quality that is particularly desirable when it comes to packing flowers for the export market. It has been bred and propagated by Yates Botanicals with the aid of tissue culture biotechnology, and will be released shortly to the landscape market and to overseas growers.

'Bush Games' was chosen for the Olympic bouquet to showcase how modern breeding work is producing improved flowers. It also conveniently displays three of the Olympic colours; and if you look at it closely it might remind you of the Sydney Opera House, or even the SOCOG logo.

The bouquet also contains some commonly grown yellow kangaroo paws. A. 'Yellow Gem' has bright yellow flowers on 1 metre stems in mid to late season. A. 'Yellow Mist', or 'Bush Haze' and 'Yellow Haze', (photographs on page 337) may also be used. See page 353 for another photograph.

Although native to WA, kangaroo paws have proven adaptable to different soils and climatic conditions, and two principal growers from northern NSW are supplying these paws. Close to 2 million stems of paws will come from this region this season, which has some of the earliest production in Australia.

Kangaroo paws are harvested from early spring through to early December, and large volumes, and as they are popular internationally, are sent to overseas markets that include Japan, USA, Europe and South East Asian countries.



▲ and ▼ *Grevillea* 'GoldenYul-lo'
Peter Abel



its parent *Grevillea pteridifolia*
▼ David Hockings





Grevillea 'Sylvia'

Grevillea

Grevillea (gre-VILL-ee-a) comprise a very large group of plants with over 340 species, the third largest genus in the Australian flora. It is the most popular genus horticulturally, with many species. Extensive breeding has produced many hybrids and cultivars, much valued as garden ornamentals.

Since many of these produce spectacular, large flowers for long periods of the year, grevilleas have been regarded as having great potential to supply distinctive Australian feature flowers for the international cut-flower market. Their use as cut flowers has been hampered by their limited vase life, although research has now identified superior genotypes for efficient genetic improvement in vase life and floral characteristics. The right harvesting stage, post-harvest treatment and transport conditions are critical to ensuring the flowers can be used and to sustain longevity. They are challenging flowers to supply in terms of quantity and quality.

The Olympic bouquet includes *Grevillea* 'Sylvia' and *Grevillea* 'Golden Yul-lo', and *Grevillea baileyana* foliage, see opposite.

G. 'Sylvia', photograph on page 341, a hybrid of *G. banksii* × *G. whiteana*, is one of the loveliest of the red/pink flowered cultivars, with large cone-shaped flower heads to 14 cm long and with a relatively good vase life. *G. banksii*, a Queensland shrub, is the parent of many well-known garden hybrids. In appearance it is very similar to G. 'Sylvia'. Tropical grevilleas that are relatives of *G. banksii* forms and hybrids are generally regarded as having considerable potential as cut flowers, being fast-growing, long-flowering, and producing flowers in a range of colours that look good in the vase. Some of these splendid cultivars are shown on page 369.

G. 'Golden Yul-lo', photograph on page 340, is a hybrid of *G. sessilis* × *G. pteridifolia*. *G. sessilis* has large heads of yellow flowers and, although less hardy in cultivation it has a long flowering period. *G. pteridifolia* is widespread in some areas of Queensland, its large golden heads of flowers a notable feature, see page 340. G. 'Golden Yul-lo' is one of the least spectacular of the large terminal flowered *Grevillea* at first glance. On closer inspection the lime green/yellow flower heads are floral gems.

The large terminal flowered *Grevillea* see page 369 for photograph

Grevillea 'Sylvia' is only one of the numerous cultivars developed for the horticultural trade. Those with round cones of flower are usually based upon *G. banksii* and include G. 'Pink Surprise', 'Misty Pink', etc.

Grevillea pteridifolia shown on page 340 is a parent of many similar cultivars such as G. 'Golden Yul-lo' and 'Honey Gem'.

They all mature to large shrubs with masses of terminal flowers and are a landscape spectacular. They are all hardy plants in reasonably drained soil and a valuable addition to any garden. As cutflowers the vase life is limited to 5 days but research is in hand to extend this. Not yet suitable for the export trade except possibly G. 'Sylvia', they are popular on the local market.

Billy buttons

The 6–8 dried stems of *Pycnosorus globosus* have been included to represent the Australian dried flower industry, with annual exports worth around \$A10 millions.

Pycnosorus globosus has strikingly large golden globular flower heads of 3–8 bisexual florets to 35 mm in diameter, shaped exactly like drumsticks borne on mostly leafless woolly stems to one metre long arising from a basal clump of silver foliage. The species occurs in Queensland, NSW, Victoria and SA. It grows on heavy soils subject to inundation, often along roadsides, in open grassland and eucalyptus woodlands and flowers from late spring to summer. A plant growing in the wild is shown on page 345.

Silvery stems and leaves make this a most attractive plant in moist garden conditions. They are suitable for open situations in full or part sun but require some moisture in hot weather. They do not last much longer than two years. In most situations *Pycnosorus* flower from spring to summer, but may produce another flush of smaller heads in autumn. Excellent germination is achieved in 5–15 days, and seed has been sown successfully in summer, autumn or spring. Division is another means of propagation.

This species is grown commercially for the cut flower trade and it makes an outstanding dried flower that lasts indefinitely. The stems should be picked just before the partial heads begin to open and while the intricate pattern is apparent on the surface. They will last for years if they are hung upside down in a cool place for 3–4 weeks or until the stems have dried. If they become dusty, they may be rejuvenated by washing under running water.

Eucalyptus

Containing around 800 species, *Eucalyptus* is the second largest genus of Australian plants. The eucalypt or gum tree forests are the defining feature of the landscape. Many of the smaller species with attractive flowers are illustrated in this issue. Eucalypts are grown in many countries and are harvested for timber and its products, for its oil and other products. A number are used for their cut flowers, foliage and fruit and three are in the bouquets.

Eucalyptus forrestiana (u-ka-LIP-tus-for-est-EE-arna), or Fuschia Mallee, bears striking fruit or “gumnuts” that will be used as the skirting of the bouquets. These red or red and yellow nuts represent the corks that outback drovers wear on their hats to keep flies at bay. (Photos on pages 356/7.)

Most *Eucalyptus* species go through a change of leaf form as they age. Stems of rounded juvenile leaves are used as a filler in flower arrangements world-wide. But ask an Australian what a gum leaf looks like and they will describe the long leafed or lanceolate-shaped adult form. Many will recall the childhood game of blowing on whistles made of a gum leaf. Two types of *Eucalyptus* in the bouquets represent this classic gum leaf. Adult leaves of *Eucalyptus pterocarpa* and the smaller-leafed *E. albida* (photo on page 332) have been given the special names of “Skippy Whistle” and “Joey Whistle”. The *Eucalyptus* foliage is supplied by the Ausbud Group, a grower-owned co-operative of 40 members in south-east Queensland and one in northern NSW. Formed in 1993 the group specializes in growing *Eucalyptus* for its foliage for both the domestic and export market. Trees grown for their foliage or nuts take 5 to 6 years to become productive.

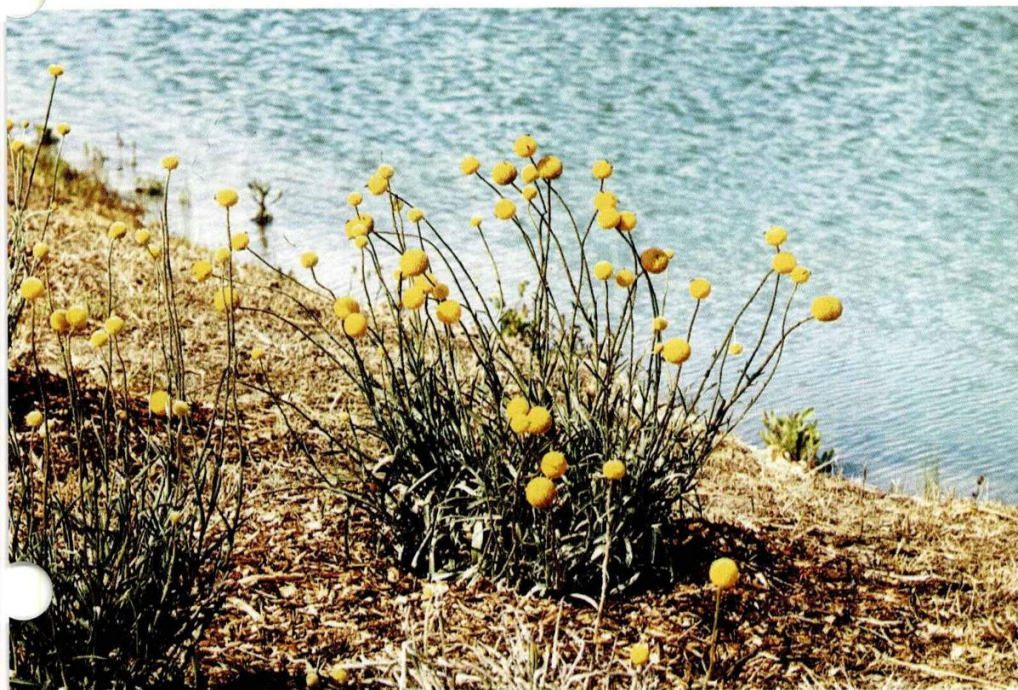
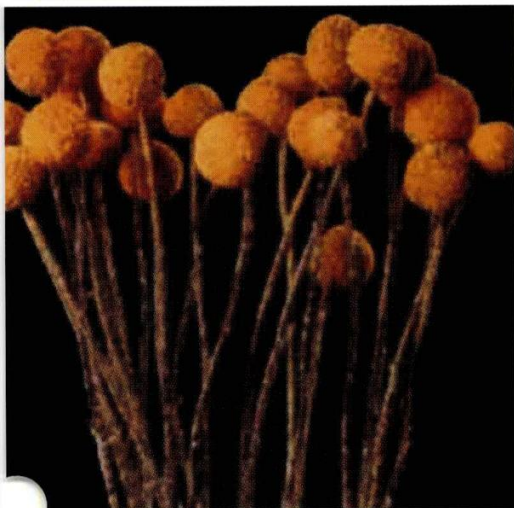


Waxflower 'Mega White', see page 335



Flannel flowers, see page 338

Neil Marriott



Billy buttons, *Pycnosorus globosus* above, (formerly *Craspedia globosa*) (pic-no-SORE-us glob-O-sus) belongs to a genus of 6 species of annual and perennial plants with taproots, native to Australia and New Zealand. They bear bright, cheerful globular flower heads held singly at the tips of relatively long stiff stems, hence the common names of Billy-buttons, Bachelor's Buttons and Drumsticks.

The 6-8 dried stems (shown above left) have been chosen to represent the Australian dried flower industry, with annual exports worth around \$A10 million. Depending on availability fresh flowers, as shown in the bouquet and reproduced above right, may be used. They are larger and a brighter yellow, a very saleable fresh flower. They are in the same family as Golden Everlastings, see page 352.

Grevillea baileyana

by Rhys McGregor

One of the most stunning Proteaceae is 'Findley's Silky Oak', or *Grevillea baileyana*. It has been used in both the Olympic bouquet and the Paralympic bouquet. The tree has two features; the foliage, and the spectacular summer flowering spikes. This tree to 25 m in height occurs naturally in tropical rainforest from Tully, Queensland, spreading north into New Guinea. In cultivation it rarely exceeds 6–10 metres. This tree grows rapidly in plantation, growing successfully along the east coast as far south as Melbourne. Ten to twelve leaves will be used in the bouquet.

Like many of the rainforest Proteaceae, the foliage has two distinct forms. The juvenile leaves are large and lobed, up to 50 cm in length. The young foliage is deeply lobed with from 3–9 rectangular or tapering lobes, up to 15 cm, forming the entire leaf. The mature leaves are usually entire or oval shaped. These are up to 20 cm in length. The most outstanding feature of this plant is the foliage. The upper surface is a deep, glossy green with the under surface a lustrous, rich golden bronze. The foliage creates a colourful display and the cut foliage is stunning in a vase or as the backing for a floral arrangement. The leaves dry without losing their colour and have a long vase life. The Iron Range form is more spectacular with a larger and more deeply lobed foliage. See photograph on page 352.

During late spring and into early summer, long, lacy, cream coloured flower spikes cover the tree. The flower spikes of creamy honey-scented curled flowers are borne terminally in branching panicles. Each raceme is up to 15 cm long with as many as 10–12 spikes occurring together.

Grevillea baileyana is long lived and establishes readily in a wide range of coastal and near coastal climates. In cultivation it tends to branch from the base, forming a tall shrubby habit. It requires little maintenance, except for summer watering during dry periods, although exposure to excessive winds may cause damage to the foliage. The juvenile foliage can be prolonged by pruning the branches. It is tolerant of mild frost. This is one of the best rainforest trees, growing well in both tropical and temperate regions.

Foliage plants for floriculture

There is a constant demand for attractive foliage such as *Grevillea baileyana* to complement floral arrangements. Other plants in this plant family Proteaceae, are also much sought after in horticulture. There are *Alloxylon*, *Athertonia*, *Darlingia*, *Lomatia*, *Neorites*, *Placospermum* and *Stenocarpus*.

If seeking commercial opportunities in foliage, leaves must be in perfect condition. This means the plants must be grown in ideal conditions. They cannot be stressed from wind, heat, cold or lack of moisture. For production in most areas, they need to be grown in a bush-house or enclosed area, covered with 50% shade-cloth to also keep out or control insects. Strict harvesting practices will yield an abundance of large lush leaves.

Paralympic bouquet

Supplied by the Australian Native Flower Growers and Promoters Inc. (ANFGP)*

The Paralympics do not have the resources of the world Olympic games series and are produced on a very small budget based largely on fund raising activities by handicapped people and their dedicated supporters.

The bouquet is shown on page 349. Focal blooms in the bouquet will be *Banksia coccinea*, surrounded by kangaroo paws, paper daisies and Geraldton wax, with foliage support by *Eremophila* and *Grevillea baileyana*. Each of these is represented on a card that will be attached to the bouquet. This card is reproduced on the next page and descriptions of these plants are on the following pages.

Forty members of Australian Native Flower Growers and Promoters will spend 820 hours over 10 days in the preparation of the bouquets. A very dedicated group of commercial cut-flower growers earning millions of dollars in export income for flowers sent all over the world.

*Australian Native Flower Growers and Promoters Inc. (ANFGP)

An association of commercial cut flower growers specializing in plants developed from Australian wildflowers. It has become the largest Australian plant growers body, the members earning millions of dollars in export income. Its formation was supported by the Australian Plants Society (NSW) to:

- (a) promote plantations of wildflowers to counter destructive bush picking. The ANFGP have been very successful, many plantations having been started or expanded since they first started. Australia's wildflowers have become the majority of cut flowers exported.
- (b) promote the use of Australian flowers and foliage in commercial horticulture.
- (c) campaign to rectify the position where South African wildflowers, particularly *Protea*, were widely regarded as Australian flora.

Cut flower producers no longer present *Protea* as Australian wildflowers and are careful to word all promotion as Australian natives and proteas. The same clarity does not exist at the florists level, a vast majority of them still including protea in bunches where wildflowers were specifically ordered. The ANFGP has made considerable advances in florist education, which is one of their major activities. They are on a national marketing committee and have made representations on this aspect.

Plantation cultivation of Australian flora (logo shown on next page)

ANFGP have produced the Australian Native Flora — Plantation Grown sticker for adoption as a nation wide marketing tool. The sticker has been reproduced on the next page. The numbers produced are critical to the unit cost and any member who can use even a few are urged to purchase some by ordering from The Secretary, ANFGP, P.O. Box 700, Kariong, NSW, 2250. They will be priced at \$0.15 each.



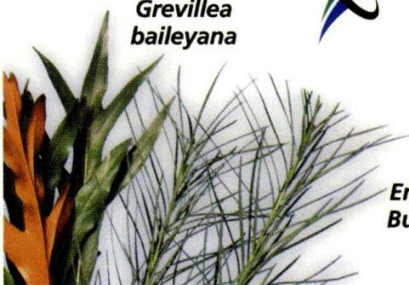
*Geraldton
Wax*



*Banksia
coccinea*



*Paper
Daisies*



*Grevillea
baileyana*



*Emu
Bush*

*Kangaroo
Paw*



- △ **Paralympic Games card** that will be attached to the bouquet.
- ▽ **Logo on sticker** to be affixed to boxes or sheaths of cut-flowers to be sold.





The Paralympic bouquet (from front and from above)

Banksia

Flowers in the Paralympic bouquet

Banksia coccinea is shown in colour on page 352. The flower head is 8–10 cm (3–4 inches) across and long and will be a striking feature of the bouquet. It was selected to represent the rugged beauty of some of the Australian flora. Found in Western Australia, it is typical of many that grow there and that are harvested for the cut-flower trade. With bright flower heads to 30 cm long, they are spectacular in the landscape or in the vase. Many gardeners wish that they could grow them, as there is an insatiable demand for these spectacular flowers.

Other very showy *Banksia* grow in the eastern states and are more amenable to horticulture. Previous issues of *Australian Plants* have illustrated these striking flower heads and provided details of their cultivation.

Waxflower

The form of *Chamelaucium* used will have white flowers to vitalize the colours of the other flowers in the bouquet and will look similar to those shown on page 344. The waxflower cut-flower industry has become a major export earner and the demand is also for flowers of various shades of pink as shown on page 353. Exports to Japan in 1998 were 8,929,930 stems being 25% of their imports of Australian wildflower cut-flowers for that year.

Plants are widely grown in gardens in a sunny place, preferably adjacent to a wall, fence or sheltered by another large shrub as shelter from the wind and to contain the warmth.

Kangaroo paw

Yellow flowered forms are used in this bouquet, either from *Anigozanthos* 'Bush Gold' or 'Bush Haze'. The Olympic bouquet on the cover also contains two yellow Kangaroo paw flowers. *Anigozanthos* 'Yellow Gem' is one of the most commonly grown cut-flower varieties. It is a tall variety, its bright yellow flowers appearing on long stems over one metre long in mid to late season. It was chosen for the bouquets for its vibrant primary colour and its branching habit. *Anigozanthos* 'Bush Haze', photograph on page 337, is another established variety, with a clear yellow flower and a green stem, while *Anigozanthos* 'Yellow Haze', photograph on page 337, has a red stem and a yellow flower. The magnificent red and green paw is shown in colour on page 336. It has problems with an ink disease of the leaves. The new 'Bush Games' on page 336 could be what we all have been waiting for.

Grevillea

Grevillea baileyana is used in the Paralympic bouquet and in the Olympic bouquet on our cover for its foliage. Note the golden sheen on the rear of the leaves on the card shown on page 348. The plant is easily grown as a large shrub or small tree. The flowers are white but not showy, but the plant is grown for its foliage, those quaintly shaped leaves, glossy green on top, glossy gold beneath.

Emu bush

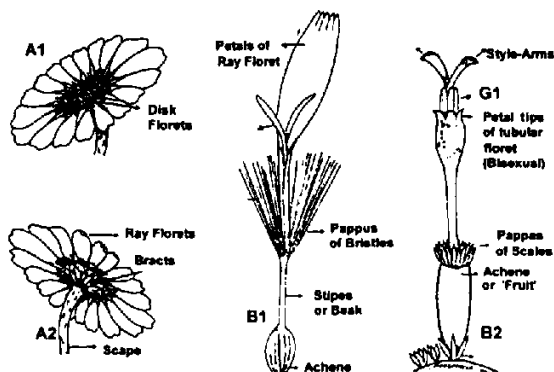
Emu bush or *Eremophila* is also used as a cupping foliage in the Paralympic bouquet. Emu bush is usually a plant of the desert, the legend being that the plant is spread by emus who feed off the bush ingesting maturing seed while they do this. The seed is not digested and when expelled in the droppings use the conditions to germinate. Those who have tried to germinate this very hard seed have a problem and rarely have a pet emu.

Plants for foliage have not been exploited. I would expect that this is the first time emu bush has been used in Sydney. In the southern states there is a developing market for this foliage although the species with silvery-grey leaves are most widely used. (A recent issue of *Australian Plants* described species of emu bush used for the cut-flower trade and outside the flowering season, as cut foliage.) Reports indicate that they obtain more income over the year from foliage.

Paper daisies or golden everlastings

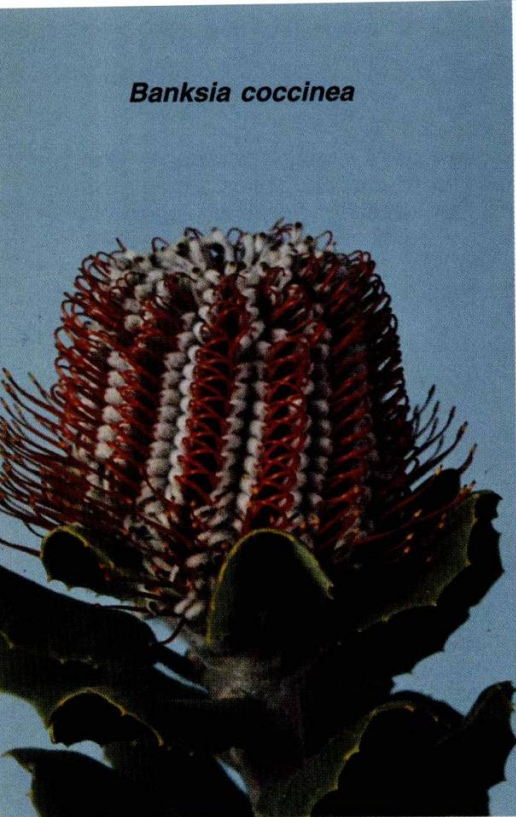
Everlasting daisies provide a bright, long lasting display in the garden or in the vase. There are many forms marketed under a variety of cultivar names. Those used in the Paralympic bouquet are supplied by Barry Luff Plantation, and illustrated on the card reproduced on page 348. They are all forms of *Bracteantha bracteata*, the smaller one with the red blush on the outer petals is 'Sunrise', the golden yellow flower is 'Golden Wish' and the largest one with the reddish tint in 'Orange Flame'.

What is a paper daisy? An everlasting daisy is really a head of many tiny flowers, inside an outer ring of papery bracts, in this case a bright yellow. In the centre are very many tubular florets, detail B2, surrounded by many ray florets, detail B1. For those interested, some of the parts of these flowers are given. The many forms of everlastings described in *Australian Plants* issues, are all readily grown from seed or cuttings.



Golden everlasting, *Bracteantha bracteata* is a very variable plant as shown on page 352. Normally a dense shrub to one metre high (the plants used in the bouquet are of this type to get a good stem length), it may be dwarfed by harsh conditions on headlands overlooking the sea. Fortunately plants propagated from these flattened small plants retain their dwarf stature and are grown as feature plants in rockeries, as borders or as flowering pot plants.

Banksia coccinea



Grevillea baileyana
foliage



Golden Everlasting (dwarf form)





Waxflower, *Chamelaucium uncinatum* in pink form



Yellow Kangaroo Paw

Ornamental eucalypts

Species for cut bud and flower production

by Kate L. Delaporte and Margaret Sedgley
University of Adelaide, PMB 1, Glen Osmond, SA, 5064

Within most eucalypt species, plants exhibit variation in morphology; with differences in the size, shape and colour of buds (operculum and hypanthium), flowers (stamens), leaves, stems and fruit. Such variability is an asset to breeders, as there is an increased chance for improvement, but is not desirable in commercial plantations, as it leads to an inconsistent product. In order to assist the developing industry in cut bud and flower production, it is important to minimize product inconsistency. We aim to achieve this via selection of superior plants which can then be clonally propagated. This will ensure that all plants of a particular line produce the same quality product in terms of colour, size, vase life and time of production.

Eucalyptus plants suitable for ornamental horticulture (floriculture and amenity planting) have certain morphological features, principally large, colourful, ornate buds and flowers or attractive clusters. Leaves, stems and fruit are of secondary importance, but must complement the flowers and buds. Plants from selected species are assessed in trials, to facilitate comparisons of growth rate, flowering and pest resistance. From these trials, plants exhibiting fast growth, exceptional flowers and high levels of disease resistance, are considered superior and suitable for further assessment. Further assessment requires quantification of the response of each plant to cultivation techniques such as pruning, postharvest treatments and clonal propagation. Plants identified with desired characters can be released to industry and used in breeding programs.

Selection at species level of eucalypts for cut flower and bud production, requires that they meet floral criteria, specifically relating to bud and flower characters. Bud size criteria range from 5 mm to 100 mm in diameter, generally with an inverse correlation between bud size and number per stem. They should be brightly coloured (red, orange, burgundy, green) with shaped, textured or ridged operculum and/or hypanthium. Open flower criteria include bright colours, or contrasting with bud, stem or leaf colour. The fruit are also of interest, as are the leaves and stems.

Selection at genotype level takes selection further, dividing the criteria into primary and secondary levels. Primary level selection criteria are separated into three main categories: flowering, where the focus is on floriferousness, precocity, buds (shape, colour and position on the stem) and flowers (colour); plant form, covering general plant habit (mallee or tree), stems (number, colour, strength and orientation), leaves (size, colour and shape) and growth rate; and plant health, encompassing the plant's response to attack by common insect pests and diseases. Selection at the secondary level focuses on the response of the plant to cultivation (pruning, harvesting, including time to regrowth of commercial length stems with buds or flowers, watering and fertilizer), postharvest testing (sucrose levels and cold storage) and propagation (cuttings, grafting and tissue culture).

Genotypes that exhibit exceptional characters for some criteria, but poor characters for others, could be incorporated in inter and intraspecific breeding programs. The resulting hybrid offspring may combine the exceptional characters of both parents, producing a plant superior to both. Some genotypes may be more suited to production as garden specimens or pot plants.

Selection experiment

Nine species of eucalypt recommended by the Australian native cut flower industry were planted in the Laidlaw Plantation, Urrbrae, South Australia, in October 1996. The species planted (all shown in full colour in this issue) were *E. anceps*, *E. erythrocorys*, *E. dolichorhyncha*, *E. leptophylla*, *E. lesouefii*, *E. stoatei*, *E. tetragona*, *E. yalensis* and *E. youngiana*. A tenth species, *E. uncinata*, was included, however as the trial progressed the plants of this species bore little resemblance to true to type seedlings, and so it was removed from the analysis.

Plantation management was kept to a minimum — irrigation was supplied by dripper at regular intervals during the summer months, trees were mulched and fertilized and weeds controlled by herbicide and mowing. At three monthly intervals each tree was measured for height and trunk diameter, and the presence of new growth, the appearance of flower buds and flowers, and insect pests and diseases were noted.

Results

The averages of the three monthly tree height and trunk diameter for each species are summarized in Table 1. *E. lesouefii* grew at the fastest rate for both tree height (79.3 mm/month) and trunk diameter (2.1 mm/month), and achieved the greatest height (mean 3.1 m) and trunk diameter (6.7 cm) in the 30 month trial. *E. erythrocorys* recorded the second best results for growth in all four categories. At the other end of the spectrum, *E. yalensis* produced the lowest rate of vertical growth (39.3 mm/month) and the shortest height (1.6 m), while *E. youngiana* showed the least trunk thickening (4.6 cm at 1.3 mm/month). *E. tetragona* produced a thick trunk of intermediate height, and all other species were consistent in their ordering, with little difference between species.

Time to first flowering varied both within and between species. Almost half the *E. lesouefii* specimens had produced macroscopic buds by the first spring after planting, less than two years after germination, along with three *E. forrestiana* trees. The majority of plants within each species had produced their first buds by the second spring after planting, or less than three years after germination. Only *E. erythrocorys* took longer, flowering in the third summer after planting (four years after germination).

The presence of pest and disease problems on each tree were recorded at each measurement period. Insect pests were sawflies (*Perga* spp.), found in clumps on *E. lesouefii* in late spring, and leaf miners (*Perthida* spp.), feeding on the young new growth of *E. tetragona*. The most common pests, and possibly most damaging from a production perspective, were the constant presence of ants and scale (*Eriococcus confusus*), and associated sooty mould. *E. anceps* were highly affected at planting, becoming less susceptible as they grew. Specimens of *E. forrestiana*, *E. stoatei* and *E. youngiana* became affected during the summer months, with some plants highly susceptible, while others were not affected.



△ Floral arrangement using *Eucalyptus* buds, flowers and foliage: in the centre *E. macrocarpa*, the large red flowers supported by its grey-green foliage; *E. youngiana*, on right has similar large-leaf foliage with large yellow flowers; *E. tetragona* has the silver grey buds and foliage on the left and *E. dolichorhyncha* foliage with the striking red buds is shrouding the container, all material from the Laidlaw Plantation, Urrbrae, SA.

Eucalyptus macrocarpa

Neil Marriott



Eucalyptus youngiana, the red flowered form.

Eucalyptus forrestiana



Laidlaw Plantation, SA.

Table 1. Summary of data for nine species.

Species	Tree height ^a (m)			Trunk diameter ^a (cm)			First buds ^b
	Final	range	rate	Final	range	rate	
<i>E. anceps</i>	1.8 ^d	0.7–2.7	42.1 ^d	5.0 ^{cd}	2.7–6.	1.5 ^{cd}	Autumn 98
<i>E. erythrocorys</i>	2.8 ^b	1.9–3.7	74.7 ^a	6.4 ^a	4.7–7.4	2.0 ^a	Summer 99
<i>E. forrestiana</i>	2.1 ^d	1.2–3.3	44.3 ^{cd}	5.6 ^{bc}	3.7–7.0	1.7 ^{bc}	Summer 98
<i>E. leptophylla</i>	1.6 ^a	0.8–2.3	40.2 ^d	5.2 ^{cd}	3.2–6.7	1.5 ^{cd}	Spring 97
<i>E. lesouefii</i>	3.1 ^a	1.8–4.0	79.3 ^a	6.7 ^a	5.2–8.3	2.1 ^a	Summer 97
<i>E. stoatei</i>	2.1 ^{cd}	1.4–2.7	53.5 ^{bc}	5.3 ^{cd}	3.5–6.9	1.6 ^{cd}	Winter 98
<i>E. tetragona</i>	1.9 ^d	0.8–2.7	46.1 ^{cd}	6.2 ^{ab}	4.6–10.0	1.9 ^{ab}	Spring 97
<i>E. yaiaensis</i>	1.7 ^a	1.3–2.2	39.3 ^d	4.9 ^{cd}	3.9–6.9	1.5 ^{cd}	Autumn 98
<i>E. youngiana</i>	2.4 ^c	1.5–2.8	61.9 ^b	4.6 ^d	3.4–7.1	1.3 ^d	Summer 98
F pr. ^c	<0.01		<0.01	<0.01		<0.01	
S.E.M. ^c	0.1		3.4	0.3		0.1	
L.S.D (5%) ^a	0.3		9.4	0.7		0.2	

^a Data are averages from 20 plants for each species, planted in 5 blocks (as replications). Different numbers indicate significant differences in a column at $P < 0.05$.

^b Season that at least 50% of plants showed flower buds for the first time.

^c F pr. ^d S.E.M. ^a L.S.D.(5%)

Over the 30 months of the trial, different levels of variation within species became evident. Some variation is valuable at the selection stage, as genotypes with more desired characters can be identified. Most within species variation was seen in bud and flower colour, as well as time of flowering and positioning of flowers. For example, *E. youngiana* plants showed either red or yellow flowers, with hypanthium size ranging from 40 to 100 mm in diameter. The buds of *E. lesouefii* varied slightly in size and greatly in bud colour — from glossy orange to highly glaucous purple. Out of the twenty *E. lesouefii* plants measured, 12 different genotypes were observed, while very little variation was apparent between *E. stoatei* plants. This highlights the degree of variation within some species and the need for selection at genotype level prior to commercial release.

The results of the trial showed that while some species, such as *E. tetragona* and *E. dolichorhyncha*, have considerable merit, others, such as *E. anceps*, do not, under the conditions of the trial. These species may grow differently in other climates and soil types. The observed variation within species of bud (consisting of peduncle, pedicle, hypanthium and operculum) size and colour, as well as flower (stamen) colour, gives positive evidence that selection of superior genotypes is required prior to the release of eucalypt species for both floriculture and amenity horticulture, to ensure the most economically and commercially viable variety is grown.

The growth rates and final recorded heights and trunk diameters reflect the natural habits of each species: *E. lesouefii* is a single stemmed tree reaching 18 m in height; *E. erythrocorys*, *E. forrestiana* and *E. stoatei* also have single trunks, but generally are small trees up to 5 m in height; *E. tetragona*, *E. leptophylla* and *E. youngiana* can be mallees or small trees (from 3 to 11 m); and *E. yalatensis* and *E. anceps* are mallees up to 6 m. The mallee type species used in this trial were as wide as they were high, with multiple trunks, thus trunk diameter for these species was generally narrower than that of the single stemmed tree species. Information on growth rates has important implications for selection of superior genotypes of cut flower species. Tall fast growing species, such as *E. lesouefii* and *E. erythrocorys*, will require different management and spacing compared to low growing, multi stemmed mallee types, such as *E. yalatensis* and *E. leptophylla*.

Selection at genotype level facilitates the identification of plants exhibiting superior characters, in the areas of flowering, plant form and plant health. Seventeen plants from *E. dolichorhyncha*, *E. lesouefii* and *E. tetragona* were selected for further assessment for plant response to cultivation, clonal propagation and post harvest testing. The majority of remaining genotypes have some desirable features and should be included in intra or interspecific breeding programs.

Conclusion

Our work has shown that *E. erythrocorys*, *E. dolichorhyncha*, *E. leptophylla*, *E. lesouefii*, *E. stoatei*, *E. tetragona*, *E. yalatensis* and *E. youngiana* are suitable for cultivation under the trial conditions, with a number of individual plants warranting further development. Other species identified with ornamental merit, but not investigated in this trial, include *E. orbifolia*, *E. macrocarpa*, *E. corrugata*, *E. burracoppinensis*, *E. ewartiana*, *E. crucis*, *E. websteriana*, *E. rhodantha*, *E. synandra*, *E. oxymitra*, *E. pachyphylla*, *E. preissiana*, *E. caesia*, *E. pyriformis*, *E. campaspe*, *E. concinna*, *E. lane-pooliei*, *E. kruseana*, *E. gillii*, *E. erythronema*, *E. sessilis*, *E. tetraptera*, *E. megacarpa*, *E. drummondii*, *E. stricklandii*, *E. pruinosa*, *E. coronata*, *E. eudesmioides*, *E. kingsmillii*, *E. rameliana*, *E. nutans*, *E. clelandii*, *E. oldfieldii* and *E. leptopoda*.

Acknowledgements. Thanks to BiometricSA for statistical advice and the University of Adelaide, Waite Campus, Alverstoke Orchard staff for help with planting and maintenance. K.L.D. was supported by the Playford Memorial Trust Scholarship in Horticulture and an Australian Landscape Trust Scholarship.

Eucalyptus cultivars with variegated foliage — New plant releases

Eucalyptus maculata 'Imagine'. The purplish young leaves turn greyed-green with a whitish to yellow/green fringe on the rim. The usually smooth bark of this species is mottled or spotted, dimpled greyish.

Eucalyptus robusta 'The Green and Gold'. The usual form of this tree has corky bark that may be persistent, the young branches a reddish brown becoming greyish brown with age. Mature leaves are a dark green but the cultivar leaves have variegations of yellow over much of the leaf surface or along the margins.

Eucalyptus erythrocorys



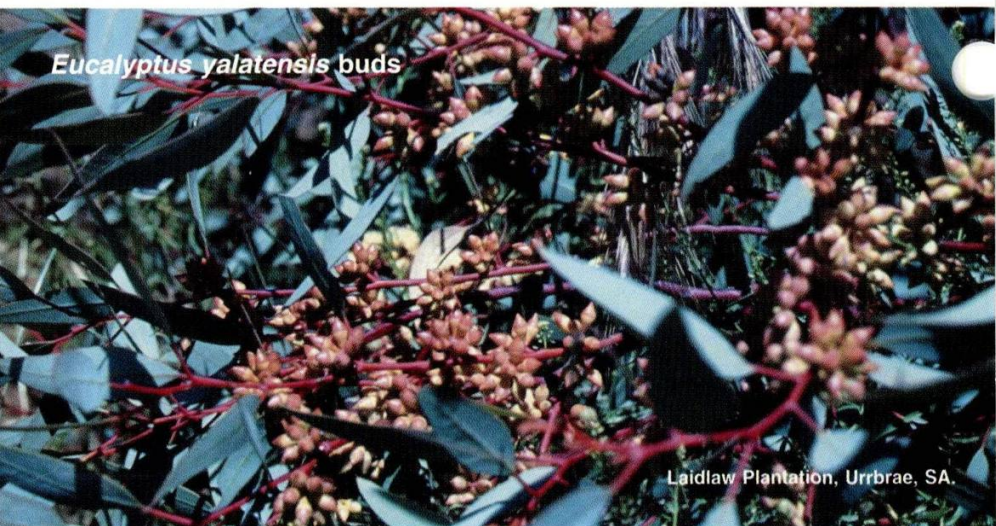
Laidlaw Plantation, Urrbrae, SA.

Eucalyptus stoatei



Laidlaw Plantation, Urrbrae, SA.

Eucalyptus yalatensis buds



Laidlaw Plantation, Urrbrae, SA.

Eucalyptus orbifolia



B. Ballingall

Eucalyptus pachyphylla



Waite Arboretum, Urrbrae, SA.

Eucalyptus lesouefii



Laidlaw Plantation, Urrbrae, SA.

Eucalyptus foliage production

by Angus Stewart, Gosford, NSW

Pruning for Best Production

My experience is that leaving a metre high stump as recommended by some leads to serious problems with stem rot caused by various fungi. A significant percentage of trees, particularly *Eucalyptus pulverulenta* may be completely killed by such treatment particularly in our humid climate. Cutting stems flush with the trunk is also recommended. I have found this also leads to significant disease problems. A sounder principle is to cut stems back to the branch collar, a small swelling found at the base of the shoot where it meets the trunk. This collar is part of the trees natural healing process when a shoot or branch falls off naturally.

I use a 2% sugar solution with a very low concentration of bleach added as a disinfectant. The stems are pulsed for about 24 hours in a cool room. I have not evaluated scientifically whether this increases vase life but anecdotal evidence from wholesalers suggests that it does help to improve the results after dry packing and freighting. There are huge differences between species as to the levels of wax, and the removal of wax during harvesting and handling is a major problem as it decreases the quality of the foliage. I have not found any easy way to keep the wax intact, suffice to say the less handling the better. It is fair to say that species with less wax are much easier to handle, e.g. *Eucalyptus polyanthemos* and *E. parvula*, however these species are not as blue as they don't have as much wax. It is a bit of a chicken and egg situation.

The time of pruning is very important and I agree that spring pruning is better. However the market demands... I am bemused by their recommendations that *Eucalyptus globulus* and *Eucalyptus cinerea* are the best species – perhaps they perform vastly differently in SA. They tend not to harden off very well in the tips in my climate and the large leaves make them of limited use to florists. They tend to prefer small leaved species such as *Eucalyptus pulverulenta* 'Baby Blue', *Eucalyptus gunnii*, *E. parvula* and *E. alba*. These species tend to harden off much better in the tips.

Red-flowered Eucalyptus

Horticultural Gems — Editor

Eucalyptus 'Summer Beauty' (pink flowered) and *Eucalyptus* 'Summer Red' are hybrids of *Eucalyptus ficifolia* (the famous red-flowering gum of Western Australia) and *Eucalyptus ptychocarpa*, a dwarf red-flowering tree of the tropics. They have been grafted onto a hardy root stock to produce dwarf flowering trees of distinction. Protected by Plant Breeders Rights (PBR) they are owned by S. T. and N. V. Henry. The plants were bred at the Glass House Mountains, Qld. The owners also operate a large-scale grafted-tree production nursery and are active in sharing the results of 26 years work with anyone interested. There has been some concern expressed about the ethics of PBR but this is a clear case of rewards well earned, adequate recognition for scientific development work and the sharing with us all, the beauty of these lovely trees.

Eucalyptus cabinet timbers

for turning and carving

Notes by W. H. Payne

These *Eucalyptus* species are much sought after for decorative timber work.

- Eucalyptus acmenoides*, White Mahogany; dense, resists termites. Fast growing.
E. andrewsii, New England Blackbutt; pinkish-grey flecked and striped.
E. astringens, Brown Mallet; hard, deep pinkish-grey, flecked.
E. baxteri, Brown Stringybark; pinkish-grey, flecked and striped.
E. bosistoana, Coast Grey Box; deep greyish-pink striped.
E. botryoides, Bangalay, Southern Mahogany; dark reddish-brown. Fast growing.
E. camaldulensis, River Red Gum; dark red-brown.
E. cladocalyx, Sugar Gum; yellowish-grey, boldly striped.
E. cloeziana, Gympie Messmate; light golden-brown.
E. crebra, Narrow-leaved Ironbark; dark brown.
E. cypellocarpa, Mountain Grey Gum; light grey-brown, flecked and striped.
E. dalyrpleana, Kindling Bark; pink, striped.
E. delegatensis, Alpine Ash; fawn, boldly striped and flecked.
E. diversicolor, Karri; dark brown, flecked and striped.
E. eugenioides, Thin-leaved Stringybark; fawn.
E. fasciculosa, Pink Gum; pinkish-cream and dark brown, striped.
E. fibrosa, Broad-leaved Ironbark; fawn.
E. globulus, Tasmanian Blue Gum; pale brown, flecked and striped.
E. goniocalyx, Bundy; greyish-yellow, boldly striped.
*E. grandis**, Flooded Gum; deep pink.
E. guilfoylei, Yellow Tingle; light brown, flecked and striped.
E. gummifera, Red Bloodwood; dark brown.
E. intermedia, Pink Bloodwood; dark brown, flecked.
E. intertexta, Gum-barked Coolibah; red.
E. laevopinea, Silvertop Stringybark; pink and light brown.
E. leucoxylon, White Ironbark; reddish-brown and fawn, striped.
E. macrohyncha, Capertee Stringybark; brown, striped.
*E. maculata**, Spotted Gum; red-brown.
E. mannifera, Brittle Gum; pink.
E. marginata, Jarrah; dark red-brown.
E. megacarpa, Bullich; fawn, flecked and striped.
E. melanophloia, Yellow Box; light pinkish-brown, distinctly striped.
E. microcarpa, Narrow-leaved Box; light pinkish-brown, striped.
*E. microcorys**, Tallow Wood; fawn.
E. moluccana, Grey Box; fawn.
E. muelleriana, Yellow Stringybark; light brown, flecked and striped.
E. nitens, Shining Gum; pinkish-fawn.
E. obliqua, Messmate Stringybark; fawn, distinctly striped.
E. odorata, Peppermint Box; deep brown, striped.
E. paniculata, Grey Ironbark; deep brown, striped.
E. patens, Swan River Blackbutt; light brown, striped and flecked.
*E. pilularis**, Blackbutt; light pinkish-brown.
E. porosa, Mallee Box; fawn, flecked.
E. propinqua, Small-fruited Grey Gum; deep reddish-pink.
E. quadrangulata, White-topped Box; pinkish-fawn, striped.
E. radiata, Grey Peppermint; light pinkish-grey, striped.
E. regnans, Giant Gum; pink.
E. resinifera, Red Mahogany; dark brown. Fast growing, cladding, panelling.
E. robusta, Swamp Mahog.; red coarse texture, straight grained. Fast grower.

Continued on page 366 ⇒

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Eucalyptus dolichorhyncha
Laidlaw Plantation, Urrbrae, SA.



Eucalyptus websteriana ssp.
norsemanica
Walte Arboretum, Urrbrae, SA.



Eucalyptus tetraptera
Monarto, Callington, SA.



Eucalyptus eucentrica

Ivan Holliday



Eucalyptus leptophylla

Laidlaw
Plantation, Urubrae, SA.



Eucalyptus preissiana

Ilma Dunn

Repairing the country

Someone does care

Editorial by W. H. Payne

Nobody in authority cares about the future of Australia was a statement in our March 2000 issue. The reasons were given. The statement has created a lot of comment, mostly affirmative, but it needs to be defended with facts not words.

The environment, biodiversity, ecology, etc., will be acclaimed over the next 9 months as **there is an election coming**. We will get fine words and glossy material and statements but will these be any more than vote seeking, fine words to be put away after the election and re-polished three years later.

We are fortunate in Australia in that we have the best political system in the world, and possibly, the best politicians on both sides of the political fence, but are they concerned for other than survival in the immediate future? We are concerned about the very survival of our continent and our way of life on a much longer term. **Some in authority do care** about the future of Australia, at least **near election time**, provided it does not cost money.

The conservation of the state of Queensland, is a classic example of a progressive **hard decision**, that needs to be taken now. The Queensland government have shown that some in authority do care and have put up \$30 million as their stake. The Federal government has agreed that this is a vital step but has balked at the \$100 million. We can find \$350 million for political advertising, but how much for the future?

The Australian Conservation Foundation have an alliance with the National Farmers Federation as reported in *Habitat* by Tim Fisher (not the retired National Party leader).

How did this association of normally conflicting parties occur? They finally realized that they had the same objective, the preservation of the Australian way of life into the future. We desperately need to repair our damaged land.

The introduction to this **report reviews the disaster confronting us** if we do not act now "the longer we wait the more we stand to lose". Based on the multitudes of reports and investigations government uses to avoid positive action, "the investment scenario estimates that \$6.5 billion in annual expenditure is required over the next ten years. In terms of public funding, the investment would require an estimated \$3.7 billion per annum, the rest from the private sector".

A five point plan has been defined. "There is too much at stake for us not to make this investment", "**we need real leadership** from the Commonwealth".

With a national election in 2001, hopefully all parties will support the **saving of Australia**.

Eucalyptus cabinet timbers for turning and carving

(continued from page 363)

E. rubida, Candlebark; deep brownish-pink, distinctly striped.

E. saligna, Sydney Blue Gum; dark red-brown.

E. salmonophloia, Salmon Gum; dark blackish-brown, distinctly striped.

E. sideroxylon, Mugga Ironbark; dark red-brown, distinctly striped.

E. tereticornis, Mountain Red; red-brown.

E. tessellaris, Carbeen; brown.

Queensland clearing controls

by Michael Fendley, Birds Australia

Queensland contains over 1000 regional ecosystems, 66 per cent of Australia's bird, mammal, frog and reptile species and 47 per cent of the nation's vascular plants. Despite its richness, however, this raft of biodiversity has been increasingly under attack from large-scale clearing of the order of 340,000 ha per year, or approximately 1½ football fields a minute. This rate increased by 18 per cent from the early to later 1990s, and appears to have increased even further in the last two years, possibly up to the extraordinary estimated rate of 500,000 ha per year (nearly as much as whole countries, such as Mexico and Venezuela, cleared per annum throughout the nineties).

Habitat destruction has led to one-third of Queensland's regional ecosystems becoming threatened ('Endangered' and 'Of Concern' categories), as they have been reduced to less than 30 per cent of their original extent. Much of the recent clearing (57 per cent) has been in the Brigalow Belt Bioregion inland of the divide, and the tenure of the clearing is roughly equally divided between leasehold and freehold land. The reason given for clearing, 86 per cent, is to provide pasture.

Finally, after a lengthy campaign by numerous groups, including Birds Australia, the Queensland Government introduced and passed the enormously important *Vegetation Management Bill*. The Queensland Government is to be congratulated for grasping the nettle.

Queensland Clearing Controls for both freehold and leasehold land, seek to provide for ecologically sustainable land development, protection of biodiversity and other environmental and social values, with planning certainty. There is provision for education and incentive schemes as well as controls. The compensation/incentives package results in a bill for \$100 million. The controls stipulate:

No clearing of:

'Endangered' regional ecosystems (where <10 per cent of pre-clearing extent remains, or 10–30 per cent remains, but total remnant is <10,000 ha);

OR

'Of Concern' regional ecosystems (where <30 per cent remains, or >30 per cent remains but total remnant is <10,000 ha);

OR

Areas of high nature conservation value (declared by Minister).

Restricted clearing of areas vulnerable to land degradation and riparian buffer zones; and

Preservation of at least 30 per cent of remnant vegetation within each of 13 bioregions.

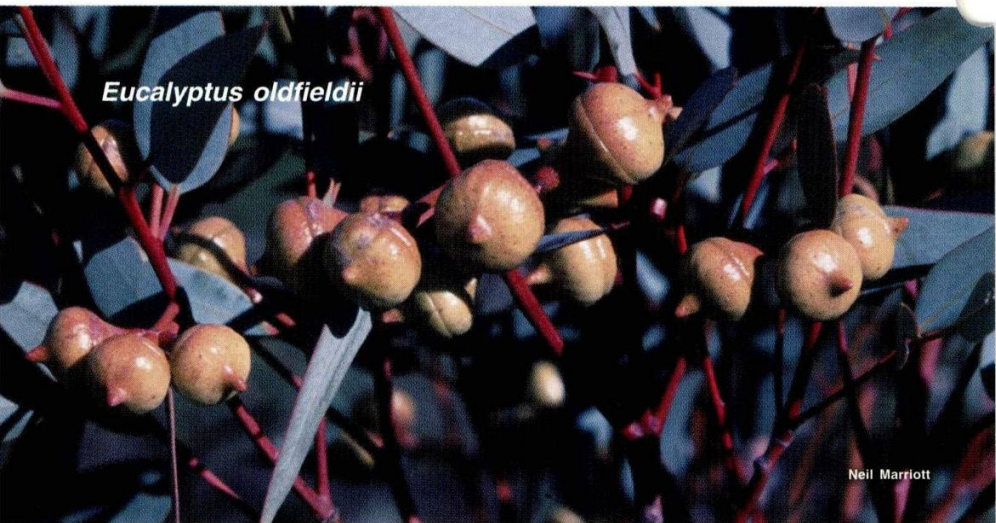
Applications to clear must be lodged as part of Property Vegetation Management Plans, and assessed against State-wide and Regional Vegetation Management Plans by Department of Natural Resources (DNR), local government and regional committees. Maximum penalties for non-compliance are \$125,000.

Eucalyptus tetragona



Laidlaw Plantation, Urrbrae, SA.

Eucalyptus oldfieldii



Neil Marriott

Eucalyptus torquata



Angus Steward



◁ ***Eucalyptus* floral arrangement**, flowers grown at Laidlaw Plantation, SA.

This features buds, flowers and foliage from *Eucalyptus macrocarpa*, *E. youngiana*, *E. tetragona* and *E. forrestiana*

▽ ***Grevillea* flowers** from the garden, see page 342.



Leptospermum

by Peter Olerenshaw, Bywong Nursery, Bungendore, NSW

A release of exceptional garden shrubs following many years of research. All are shown in the colour plates on pages 372 and 373.

***Leptospermum* 'White Wave'** is the first in a series of closely related tea trees from the same cross but segregated into a range of colours and sizes. When you have grown this plant you will look for future releases, all with bright and clean foliage of medium size, smaller than 'Aphrodite' but similar in colour, with pink shades, mauve, purple and red.

'White Wave' is a low spreading shrub to 0.5 metre high and 1 metre across with a tendency to cascade. In pots it grows flat and falls over the edge. It is well covered in large pure white flowers with a green centre, that are pinkish in bud. Flowers occur in late September/early October. They will flower after one years' growth if potted early enough to be full size in autumn.

Because of its size 'White Wave' should be especially suitable for people who have limited space to create a garden. It could be used to advantage on banks or close to walls where the branches have the opportunity to cascade. Planted in groups, it could be used as a low groundcover. An attractive plant can be achieved by training the central leader up a stake and allowing the side branches to droop down. Plants grown in this manner have flowered very heavily.

***Leptospermum scoparium** 'Freya'** is a small-medium upright shrub growing approximately 1–1.5 metres high and 1 metre across. Spring is when this shrub comes into its own, when it is covered in masses of delicate soft pink flowers that can be a feature for about four weeks.

'Freya' looks great as a pot plant. It could be grown outside for most of the year and then placed in a prominent position whilst in flower. It could also be used to advantage as a shrub for narrow gardens where space is limited. A light trim and feed after flowering is recommended. This will encourage new growth and improved flowering the following season. Mulch to conserve moisture and inspect for insect activity.

***Leptospermum* 'Rudolph'** is a tall shrub that will grow 2–3 metres high and 1.5 metres across. It has attractive burgundy coloured new growth that matures to a dark green. A summer-flowering tea tree with large red flowers. Your plant will come into bloom just prior to Christmas when many other shrubs have completed their flowering season. Because it is fast growing and adaptable, it can be used to advantage in many situations. It is an ideal height for screening or for hedges and could be planted as a specimen, in mixed plantings or native gardens.

'Rudolph' will grow in a wide range of soil types and climates. It is frost hardy and prefers to grow in a sunny position. Pruning or trimming to shape should be carried out after flowering. For best results 'Rudolph' will benefit from a light regular feed with a balanced fertilizer. Mulching to control weeds and conserve moisture would also be beneficial.

Leptospermum 'Aphrodite' is a hardy medium shrub growing approximately 2.5 metres high and 2 metres across. It has vibrant candy pink flowers and bright green foliage. Flowering is in late spring/early summer. The habit is upright, dense and well branched from the ground. Aphrodite is very adaptable and will tolerate a wide range of conditions and soil types, it can be grown in coastal or cold climates and is equally at home in wet or well drained sites. To keep the plant at its best, prune lightly after flowering and fertilize with a complete fertilizer, mulching is advisable to keep down weeds and conserve moisture. Aphrodite is ideal for landscape and amenity planting and can be used to attract birds and enhance the early summer garden. *Leptospermum 'Aphrodite'* originated as a seedling selection from a batch of *Leptospermum spectabile* plants. Under field conditions it was assessed for many years prior to release. *Leptospermum 'Aphrodite'* is a departure from the coloured forms of tea trees based on *Leptospermum scoparium*.

Leptospermum 'Rhiannon' has masses of large mauve flowers in late spring. The leaves are dark green and glossy and the plant has an upright habit. 'Rhiannon' should be planted in well drained sites and open sunny positions are preferable. It can also be grown in a large tub as a pot plant if space is limited. The flowers have good vase life and last well if picked in bud. A light pruning after flowering will promote new growth and keep the plant dense. An application of a complete fertilizer in spring and autumn will maintain healthy new growth for maximum flowering the following year. *Leptospermum 'Rhiannon'* was selected from a breeding program for the good colour and large size of its flowers and the massed display in spring. It has been trialed for 8 years at Bywong Nursery prior to release.

Leptospermum 'Merinda' is covered in vibrant magenta flowers in spring that create a stunning display. In any situation 'Merinda' will give your garden a bright splash of colour. Its early growth tends to be spreading or cascading, but with maturity it will develop into a compact small to medium shrub. 'Merinda' can be used to great advantage in small gardens or courtyards and makes an excellent pot plant. Merinda is an aboriginal name which means pretty woman and this shrub is certainly very attractive. It responds well to trimming to promote new growth. Apply a complete fertilizer and maintain a mulch to keep weeds down and retain moisture.

Temperate Eucalypt Woodlands In Australia* by R. J. Hobb and Colin J. Yates
The book claims to detail the biology, conservation, management and restoration of these widely threatened areas. The book is an excellent reference to temperate woodlands of NSW, Victoria, The Capital Territory, Tasmania, South Australia and Western Australia with detailed reports for each state. While they define the obvious disaster and destruction, they serve as a basis for broad and site specific action. "There is progression through the book from devastation and despair onto hope and repair". For me the real hope is the awakening of scientists to the mood of the nation and not just accepting the *establishment* policy of encouraging debate, the structuring of more committees and bodies, anything to quieten the voter as long as it does not involve significant cost. The final chapters are tongue in cheek conclusions by government scientists.

***Woodlands, Temperate Eucalypt, In Australia**, edited by R. J. Hobbs and C. J. Yates and available from Surrey Beatty, 43 Rickard Road, Chipping Norton, NSW 2170 for \$99. A book of 430 pages, it arose from papers at a conference of scientists and ecologists in this field in 1996, studies that have been updated to the time of publication in 2000.



Leptospermum 'Aphrodite'



Leptospermum 'Rhiannon'

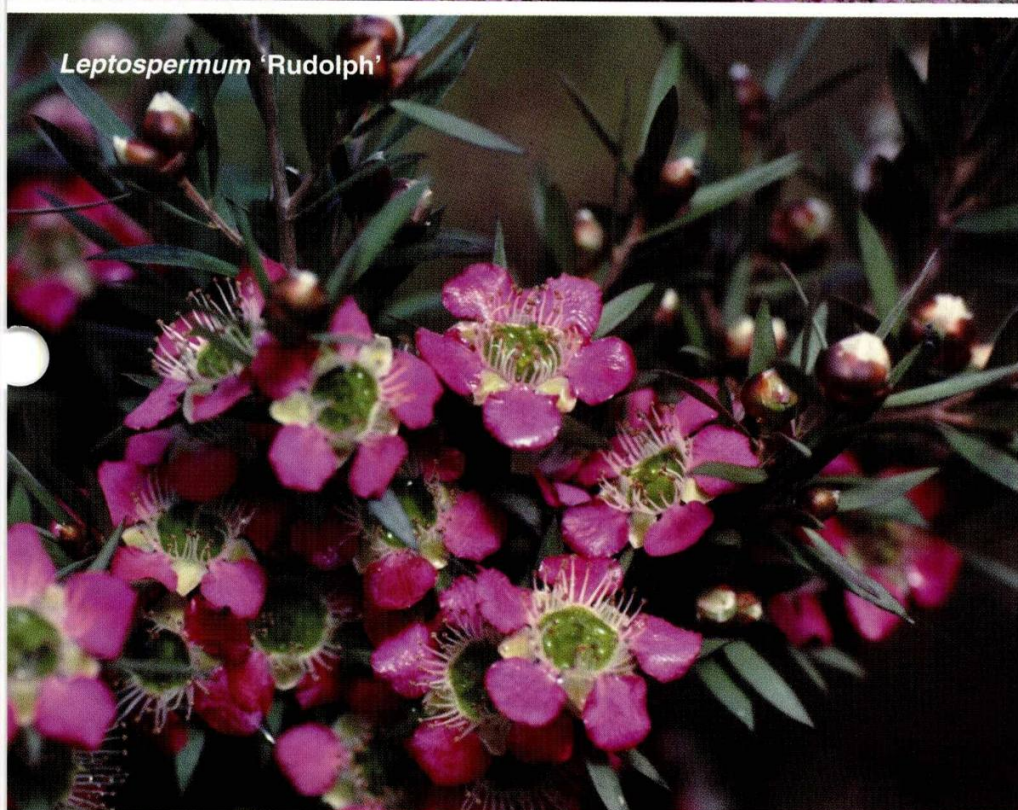


Leptospermum 'Freya'

Leptospermum 'Merinda'



Leptospermum 'Rudolph'



Eucalyptus eucentrica Red Mallee, photo (page 365) and notes by Ivan Holliday
A spreading straggly mallee, 4–7 m high, but often wider in spread. The bark is rough at the base but changes to a smooth grey or tan and then cream with powdery white [glaucous] twigs and buds. Adult leaves are bluish, often glaucous and they contrast beautifully with the pale yellow to mid-yellow flowers and powdery white bloom over red buds. These have long, horned operculums. Fruits are urn-shaped, 5 to 9 mm long, with projecting style remaining. It is closely related to the common *E. socialis*. Particularly ornamental if pruned to a good shape, so as to display the flowers and foliage.

A widely distributed tree in the north-west of SA from the Gawler Ranges west and northwards into the Great Victoria Desert and into WA and the NT. It is found in red sand over limestone or in low sand dunes over limestone. Specimens are growing on a Goodwood property in heavy black clay, and at the Waite Arboretum in Adelaide's common red-brown earths.

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 brachyctenons, 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 Roadland Bay Rd, Loganholme, Qld 4219. Tel. (07) 3806 1414.

Wildflower Nurseries in New South Wales

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

Bryants Native Plant Nursery — Cosy Camp Rd, Bex Hill, 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, Dalgety 2630. Tel. (02) 6456 5043. Specializing in alpine and dry Monaro plants — Sorry no overseas orders. Phone to arrange a visit.

Illawamba Native Growers — P.O. Box 89, Cobar, 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.

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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.

Warrimarra 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 Tailem 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 — Australia's largest range of Australian plants. Delivery Australia-wide. Free stocklist on request. The Kuranga Handbook of Australian Plants now available RRP \$19.95. A comprehensive guide on plants stocked at Kuranga, 393 Maroonah Highway, Ringwood 3134. Tel. (03) 9879 4078. Open 7 days.

Australian Wildflower Seed Suppliers

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

Wildflower Society of Western Australia (Inc.) — P.O. Box 64, Nedlands 6009. A range of seeds available, labelled and packed, at \$1.00 (plus postage) per packet. Send for a 1997/98 Descriptive Seed List (\$1.95 posted) to: The Seed Sales Officer, Eastern Hills Branch, 85 Swan View Road, Swan View, WA 6056. 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 the 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 and easily read description of each species and details of its occurrence and cultivation. They are available from the Australian Plants Society NSW, P.O. Box 744, Blacktown, NSW, 2148, at \$44 per volume plus postage and handling of \$7.50 for 1 or 2 volumes and \$15 for 3 volumes within Australia and \$14 per volume overseas.

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Editorial Material: Editor, Australian Plants, 860 Henry Lawson Dr., Picnic Point 2213. Enquiries by mail only. Email address: austplantsed@nectar.com.au. Fax only by appointment on (02) 9773 9866.

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Sydney 2000 Olympic Games, winners' bouquet
Paralympics bouquet see page 349