

Australian Plants

Registered by Australia Post
Publication No. NBG 1592

December, 1981
Vol. 11, No. 89

75c



The Year Of Achievement — 1981

Editorial

This has been a year of results for survival of our Australian Flora.

It started well with the bestowing of Membership Of The Order Of Australia to Olive and Percival Parry of "Floralands", Gosford, and Enid Bowman of Melbourne. Together with the previous award to George Althofer, these honours recognise the devotion over a lifetime to the survival of the Australian Flora. We all honour you.

The Australian Flora Foundation was established on the 14th August, "to foster research into the biology and cultivation of the Australian Flora". Have you sent your \$25.00 for a sponsor-membership? See page 236. Now is the time for a show of strength and support. At no time in the past or the future, could the donation of such an amount have such far reaching consequences.

Flora Of Australia — Volume I of our flora, a series of books eventually becoming 40 volumes, was promoted at the XIII International Botanical Congress on the 22nd August, 1981. See page 223.

A Curious and Diverse Flora — A magnificent film produced by the C.S.I.R.O. on the Australian Flora of all areas of this unusual continent of ours. See page 233.

Australian Plants — An all-time high in presentation and quality. Your journal will be dearer next year and will continue to need your support.

What should be published? It is certain that we cannot hope to please everyone in all issues. Strangely three letters arrived recently in one mail. The SGAP-New England Group, Armidale, N.S.W., writes . . . "The journal is no longer about growing native plants, but has become a botanical publication". Our committee feels that these complaints are a little unfair because, looking through back numbers, there is an obvious attempt to strike a balance. Also, we suspect, the balance may not result from editorial policy, but from a sheer lack of articles from the very people who do the complaining, including ourselves."

From a reader in Doubleview, W.A. . . . "A major problem for myself and other amateurs is identification of species — in this regard the articles and illustrations on *Verticordia* and *Conostylis* were greatly valued. Would it be possible to have more of this format in future?"

From the author of *Exotica* and *Tropica* in the U.S.A.: "Your society publishes one of the best plant magazines in the world, and in such fine colour too, the photos, the research and the descriptive text . . ."

Other correspondents have advised the need for plant name changes or new species names and others have entered into the debate on the value of cultivar names and the "waste" of space used in their description.

Many hundreds advise of their delight with the whole production.

Editorial Policy: To encourage the cultivation, preservation and development of the Australian Flora. First priority is given to articles on cultivation presented in such a manner that both beginners and those with some experience, can be better informed and hopefully, encouraged to try harder to get better results, and to appreciate the enormous value and potential of the Australian Flora in horticulture. The New England Group is quite correct in that every note forwarded on readers' experiences is developed, after consultation with the author, and published. We do not get enough. They are also correct in that the few that do the complaining are not included in those who contribute.

The articles that a layman may regard as botanical are the result of considerable work in revision of technical papers submitted or published elsewhere. They are rarely submitted, unsolicited but chosen carefully to present an overall plan for a Volume and to make "Australian Plants" a valued reference to the Australian Flora and its cultivation.

Considerable space is expended in this issue on *Callistemon* as the very many names have caused confusion, because this group of plants is ideal for a beginner to start propagating and growing, because they are extremely valuable for landscaping and garden display, because they are hardy reliable plants, and because they are suitable for cultivation in gardens and parks in all areas of Australia.

CONTENTS OF THIS ISSUE

<i>Olearia</i> — The Daisy-Bushes	D. Woolcock	191
Sturt's Desert Pea	T. Cavanagh	195
<i>Callistemon</i> — For Horticulture	D. L. Jones and R. Elliott	199
Flora Research — Telopea, Vol. 1, No. 6 (1980)	Staff, Nat. Herb., Sydney	222
Grafted Desert Peas	D. McKenzie	228
Propagation Of Wildflowers	W. Payne and B. Fairley	231

COVER PLATE: *Callistemon* 'Reeves Pink'

Photography by Rodger Elliott

See page 218 for a description.

AUSTRALIAN PLANTS — No. 89 issue of Volume 11, comprising issues 85-92. International Series Index ISSN 0005-0008. A National publication in 16600 copies. Published by The Society for Growing Australian Plants. For details see last page. Available to members or by subscription of \$3.00, including postage to your address. Send to the Editor 860 Henry Lawson Drive, Picnic Point, N.S.W., 2213. Publication date of previous issue, No. 88 was 1st September, 1981.



OLEARIA

The Daisy-bushes

by D. Woolcock

The Daisy-bushes are showy, attractive members of a very large group of plants — the family Asteraceae. Formerly known as Compositae, this family is spread throughout the world in great numbers, growing in widely varying habitats. In Australia the Daisy-bushes flourish in the mountains as well as along the coast, in hot dry areas and in cool damp forests and confidently display their charms — and their flower-heads! — on low spreading bushes or quite tall shrubs. In the home garden they are hardy and dependable, growing easily from cuttings, filling in corners if they are small shrubs, or growing gracefully with and through taller shrubs.

Near the coast and in the forests of south-west Victoria, the *Olearia* group do well, enjoying the cool temperate climate and a good average annual rainfall. So, the species in the gardens in Victoria are from the local areas — *Olearia ramulosa*, *O. asterotricha*, *O. glandulosa*, *O. erubescens*, *O. speciosa*. In a sheltered well-drained situation two of the inland species have settled in and are growing well — *O. magniflora* (Splendid Daisy-bush) and *O. rudis* (Azure Daisy-bush). Other species of the southern temperate regions are *O. floribunda* and *O. glutinosa*, the latter, like *O. axillaris*, preferring the coastal sands and sandstone.

***Olearia ramulosa*, Twiggy Daisy-bush**, helps to form the dense plant community that covers the sandy and rocky slopes close to the ocean and is open to the strong prevailing southerly winds. In this situation *O. ramulosa* is a compact leafy bush seldom more than 30-50 cm high, but in spring and early summer produces a massed display of small white flower-heads. It is widespread, too, in the forest and grows into a tall graceful shrub up to 2 metres high, while in the garden it is a handsome round bush covered with its small fine leaves and thick clusters of flowers.

***Olearia asterotricha*, Rough Daisy-bush**, looks very attractive along forest roads and tracks with its sprays of blue daisy flowers. This showy species likes the shelter and support of taller shrubs and has long fine branches well-covered with dark green leaves that have a toothed edge. The leaves are shiny and rough on the upper surface, felted underneath and are up to 4 cm long. The blue/mauve heads are relatively large, with 12-24 rays and are often solitary, on stalks longer than the leaves. In the garden *O. asterotricha* grew from a cutting into a tall open shrub, supporting its long branchlets on a neighbouring *Fuschia* sp. with deep salmon-pink flowers — a good combination of colour. It flowers from October to December.

***Olearia erubescens*, the Moth Daisy-bush**, likes cool damp forests growing near Portland on the coast, but is widespread throughout the eastern highlands of Victoria, the Otways and the Grampians. It has long open branches and shiny dark-green toothed leaves, larger than those of *O. asterotricha*. In spring it is massed with long-stalked clusters of white flower-heads. In the garden it is doing well in a damp sheltered position, this species, too, growing from a cutting.

***Olearia speciosa*, the Netted Daisy-bush**, is a smaller shrub than the two previous species but has larger dark-green leaves with toothed edge. The flower heads are large, white and showy, about 25 mm across, and are displayed in many flat-topped clusters. The small open bushes prefer some space for growth and make a showy display in October/November.





***Olearia rudis* (Above)**

Photography by C. Woolcock

This small shrub has stems that are rough with short hairs and long wedge-shaped leaves with serrate margins. The flower-heads are large and are solitary or in small clusters at the ends of the branchlets. The ligules of the ray-flowers are fine, numerous, about 12-15 mm long and a lovely mauve-blue colour; and the disk-flowers are crowded and golden-yellow. Like *O. magniflora* this species favours the mallee country in Western Australia, South Australia, Victoria and western New South Wales. This plant was photographed on the edge of the Hattah National Park — south-east of Mildura.

***Olearia magniflora* (Top left)**

Photography by C. Woolcock

The fine spreading branches and smooth, wedge-shaped leaves give this shrub a somewhat straggling appearance at times. But the daisy-heads are large, solitary at the ends of the branchlets and show off to advantage their magnificent blue-purple against the red mallee sands. The ray-florets usually number 14-20, the rays being about 20 mm long; and the disk-florets are numerous and bright golden-yellow. This *Olearia* grows in the Mallee areas of South Australia, Victoria and New South Wales.

***Olearia pimelioides* (Bottom left)**

Photography by C. Woolcock

In late winter and early spring this daisy-bush brightens the mallee scrub with its massed covering of white flowers. It is very widespread and appears in the drier areas of Australia from W.A. across the Great Bight to Eyre Peninsula and on to the Victorian Mallee and New South Wales. The leaves are small, dark green, obovate and crowded along the branches. The rays (ligules) are white, about 1 cm long and usually number up to 20, while the disk-flowers are golden and numerous. Often it grows as a compact semi-globular bush to 1 m high and with its mantle of white flowers, is very attractive and conspicuous.

***Olearia glandulosa*, the Swamp Daisy-bush**, is a tall graceful shrub often growing to more than 2 m high. The leaves, 30-50 mm long, are dark-green and thread-like and are covered with lumpy, minute glands which give it its specific name. The long, fine branches have erect terminal sprays of small white daisies, which are strongly perfumed. Through the forest it likes to edge wet depressions and makes a magnificent show in early summer. In the garden it grew rapidly from a cutting into a tall, fine-leaved shrub of 2 metres, covered with sprays of flower-heads, enjoying the cool damp aspect provided.

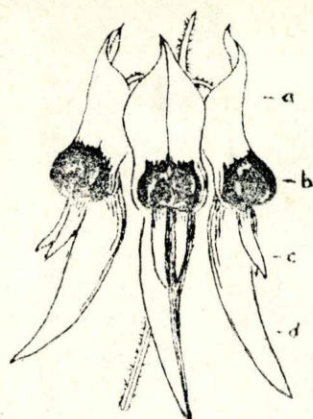
***Olearia axillaris*, the Coastal Daisy-bush**, is very widespread through the coastal sandhills and limestone ridges of the Victorian south-west (miles of it, too, along the Corong in S.A.), and is conspicuous with its dense silver-grey foliage. The flowers are small and yellow, tucked down in the axils of the silvery hairy leaves but the bushes are erect and tall, growing 2-3 m high.

***Olearia glutinosa*, the Sticky Daisy-bush**, the other sandhill daisy of the Victorian south-west, is a dense shrub of the same height, with dark green leaves and flattish sprays of white heads — and makes its presence known by its strong pleasant scent.

Olearias of the arid and semi-arid regions are a truly delightful group and flower in profusion from late winter through spring. It is a quite unforgettable sight seeing the daisy-bushes massed along the sandy tracks and through the open scrub of the Mallee areas of South Australia and Victoria. On one sandy hill (in scrub) there were glowing patches of white and blue — the dome-like bushes of *O. pimelioides* and *O. muelleri* providing white to complement the blues of *O. magniflora*, *O. rudis* and *O. ciliata* — with the dainty white *O. microphylla* a little further along. The dry country of Yorke and Eyre Peninsulas of S.A. provides the right habitat for "Olearia — Hardy Wildflowers for Alkaline Conditions" ("Aust. Plants" Vol. 6, pp297-8) including such species as *O. pannosa*, *O. muelleri* and its close relation *O. calcarea*, *O. pimelioides* and its var. *minor*, and *O. picridifolia*. The Velvet Daisy-bush, *O. pannosa*, has large showy white heads and seems equally at home along the road verge and fence of a farm paddock, or decorating a grassy corner under trees on a hilly road in the Middleback Range west of Whyalla, or growing in a gully in the northern Flinders Range. The author of the article mentioned above, Mr. K. Warnes of "Waldon", Owen, S.A., writes of *Olearia magniflora* (Splendid Daisy-bush) "So insignificant is the spindly growth of this species that it is easily forgotten — until September when it suddenly "arrives". Every shoot terminates in a glowing, metallic lilac-coloured daisy, 2" across, to make it a feature of the planting". These words recall the moments of delight when we saw the vivid patches of blue-mauve through the Mallee trees and are an apt description of this lovely species. Most of these dry inland daisies appear to have been grown successfully in gardens, with the advice (Mr. Warnes again) — "In common with most of this genus, pruning maintains shape and improves flowering".

***Olearia* in the garden**

With their wide range of habit and habitat the three large groups of Daisy-bushes — the dry inland, the temperate and coastal, and the mountain — could provide a bright corner in the garden, as they also cover a long flowering period from late winter through spring to late summer, even into autumn. *Olearia* of the mountain regions are usually quite large bushes, tall and sturdy, with big leaves and flower-heads, and line the edges of mountain roads with an impressive presence. This group includes *O. lirata* (Snowy D.-b), *O. argophylla* (Musk D.-b), *O. frostii* (Bogong D.-b) *O. phlogopappa* (Dusty), *O. megalophylla* (Large-leaf) — but, unfortunately for me, they are mostly in a distant world. ■



Sturt's Desert Pea

A History of its Cultivation

by Tony Cavanagh, Ocean Grove, Victoria

The spectacular red and black flowers of the Sturt's Desert Pea appealed just as much to European gardeners of last century as they do today. From the time of its introduction into England around 1835, the major nurseries and individual growers strove to cultivate and flower the plant and horticultural magazines of the period contain numerous references to and beautiful colour plates of the Desert Pea and its various horticultural varieties. It was certainly not an easy subject in the cold climate of Europe but so great was the interest in Australian plants that it was among the 1200 species which had been grown by the 1880s. A short life and inability to tolerate root disturbance led to its being grafted onto hardy rootstock.

Discovery and Early History

The rather colourful character William Dampier, pirate and adventurer, collected specimens of the Desert Pea in what is now Dampier Archipelago, possibly on Lewis Island in August-September, 1699. His collection of 23 plant specimens is housed today in the Sherardian Herbarium at Oxford and is of major historical interest in that it represents the first recorded collection of Australian plants. It was not until July 1817 that the next collection of the Desert Pea was made by the explorer and botanist Allan Cunningham.

The location is given variously as the eastern/western shores of Regents Lake on the River Lachlan and the plant was called *Kennedya speciosa* by Cunningham who was not then aware of Dampier's discovery. In the next year, on the survey expedition of Captain King, he was much surprised to find his *Kennedya* growing on an island in Dampier Archipelago though he remarks it was not common. Cunningham described these two plants in the Transactions of the Horticultural Society of London in 1835 as two separate species — *Clianthus oxleyi* for the Lachlan River specimens and *C. dampierii* for that from the Dampier Archipelago. Over the period 1817 to 1844, 6 collections were made, the last being by Sturt.

Clianthus formosus has also been called *Clianthus speciosus* and *C. dampierii*. It was given its current name by Ford and Vickery (1950).

Early Cultivation

There was a delay of some 17 years from Cunningham's rediscovery of the Desert Pea in 1817 to its introduction into England for horticultural purposes by the famous nursery, Messrs. Veitch and Sons of Exeter in 1834, under the name *Kennedya speciosa*. Its culture was obviously attended with some difficulty, however, for we hear no more of it until about 1850 when a flowering specimen from the greenhouses of Messrs. Veitch and Sons of

The Sketch Above. As described in Issue 86, page 54, *Clianthus formosus* belongs to the pea flowered group of plants, Fabaceae and (a) is the standard, a large red petal with a black boss at (b), (c) are the wings (two small red petals) and (d) is the keel comprising two more red petals.



Clianthus formosus* var. *marginatus

Photography by Tony Cavanagh

A delight in the English gardens of 1890, has the beautiful form been lost?

Will readers please report on any colour forms that can be preserved by the authors of the enclosed articles.

Exeter was awarded a large silver medal of the Horticultural Society in the April exhibition; in the words of Paxton's Flower Garden of 1850-1851, "an honour never conferred upon any new plants, except such as are of surpassing value as objects of cultivation". The flowers continued to be much admired and over the next 10 years coloured plates of them were featured in popular gardening magazines from France, Belgium, Germany to England.

The most common complaint of nearly all early writers was its fickleness in cultivation — "it dies suddenly in the most unaccountable manner", and "the treatment which produces complete failure in one case and brilliant success in another is apparently the same". A grower in Windermere wrote in 1888, "Nothing delights me more than to get hold of an obstinate plant and beat it. I have been doing this with *Clianthus* for twenty years (emphasis mine) and I hope I have beaten him". Two features of cultivation which run through every success described are the soil (whether it be charcoal, rotten manure and sand mix, or loam, peat and manure or loam peat and sand) which must be well drained, and the need to be extremely careful when repotting or transplanting in not disturbing the roots — "so impatient of having its roots disturbed that even if a few bits of drainage crock are removed during repotting, I could never afterwards get it to move so as to be of any use". In fact, with seed grown plants, growers were advised to plant the seed in situ. Attention to watering was stressed — "the plant needs copious quantities of water when growing "and" water(ing) the plants carefully during the winter to prevent damping off to which they



A Sturt's Desert Pea In Captivity

Photography by Tony Cavanagh

A plant grafted and grown by Doug McKenzie — see pages 227 and 228 for details.

are particularly liable". The havoc caused by snails and slugs was also well known — "It should also be protected around the collar or neck by cotton wadding to keep off slugs, which are great enemies of this plant in its younger stages". Its greatest trouble however was its susceptibility to red spider, still a problem with plants grown in Australia.

Most growers sowed their seeds from April to as late as early autumn and usually over-wintered the plants in a warm greenhouse held at about 45°F (3-4°C) by night and warmer during the day. The seed was generally imported, though established plants — "produce(s) seeds freely, and they grow readily, but must not be afterwards disturbed". Plants were commonly grown on raised borders (or "long light pits") in low roofed greenhouses or as pot plants, with particular attention being paid to providing a coarsely textured, well drained soil. The progress of the plant was rapid in spring and flowering occurred in April/May. And what flowering! In a single season some plants produced as many as 150 spikes of bloom, each consisting of from 3 to 6 flowers. A Mr. Rawson of Windermere was delighted with the early blooming of his plants, grown initially on bottom heat, which flowered in 5 months from seed sown in February. Because of this characteristic, the Desert Pea was sometimes used as a summer bedding plant in milder areas of England such as Somerset. Most writers agreed it was an annual.

Grafting of Sturt's Desert Pea

The rootstock used in England was apparently *Clianthus puniceus* (the New Zealand Glory Pea or Parrots Bill) while in Germany the unrelated *Colutea arborescens* was tried. *C. puniceus* is the only other relative of *C. formosus* and was well known as a hardy greenhouse plant having been introduced into cultivation in 1835. Somewhat surprisingly, it also grew well outdoors and one plant is reported as having lived several years against the south west wall of a house in Kew, London. Unlike *C. formosus*, it has a strong root system and can be grown readily from cuttings.

The technique employed in England was described by a writer in *The Garden* in 1890 (March 29, p. 299). Young cutting-grown plants of *C. puniceus* were used as the stock and seedlings of *C. formosus* 2-3 months old were used as the scions. These were cut at the base and wedge-grafted onto the stocks about 50 mm above the ground. It was claimed that a union could be achieved in about a fortnight if the grafts were kept in a close frame.

The German method was somewhat more delicate as it involved so-called cotyledon grafting. Seedlings of *Colutea arborescens* (which in its natural habitat can be a 5 m shrub!) were used as stocks and cut over near ground level. The *C. formosus* seedlings while in the cotyledon stage were wedge grafted into a cut in the stock and the graft kept under a bell jar till union took place. Evidently, there were few incompatibility problems and in 1890 we read of a German firm which apparently regularly exported grafted stock to England and other countries.

Growers of these grafted plants reported no problems and that they were as hardy as Geraniums, Stocks, etc., only requiring protection in outside beds in winter. No indication of the expected life is given but the plants were often lifted with a good ball of soil around October and overwintered in a greenhouse. It is not clear what happened in later years or for how long grafted plants continued to be supplied. We have no knowledge of their availability in Europe today though many indoor plant books recommend stock grafted onto *Colutea arborescens* for hanging baskets and pot plants.

Varieties and Colour Forms

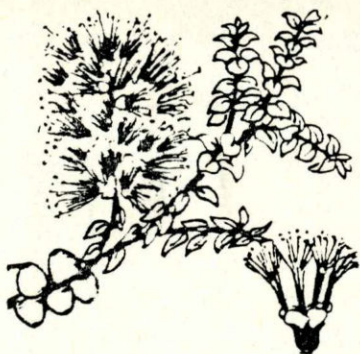
The "classic" desert pea flower is a deep scarlet or red on the standard, keel and wings with a black or dark red boss. In nature, many colour variants are known, ranging from red through pinks to yellow and even albino forms found in the Pilbara and Lake Lefroy south of Kalgoorlie. The boss is less changeable, being generally black or shades of dark red to brown. The colour forms are usually found growing as individual plants among the normal-coloured population and the variations observed are probably due to small genetic differences. In cultivation, Webb (1972) reports that they are much less vigorous than are normal strains and are more difficult to keep alive. However, there might be more chance of success with grafted plants if specimens of colour variants can be grown.

In Europe, a range of horticultural varieties was available of which the best known was var *marginatus*. According to contemporary records (*Garden*, March 29, 1890, p. 300) the variety was first distributed by Messrs. Hendersons in 1865 and a colour plate was produced in the *Floral Magazine* of 1866. While it is alleged to come true from seed, apparently it proved difficult to maintain and the variety vanished until 1875 when it was raised in Germany and given the name *Deutsche Flag*. It may also have been known as var *germanicus* and was apparently in cultivation as late as the 1890s.

Its main difference from the typical flower is a white coloured keel margined with scarlet. The variety tricolour (described in *Gardeners' Weekly* of 1888, p. 409) had an all white keel except for the tip which was bright scarlet. Regrettably, apart from sketchy contemporary records, little is known about these plants.

Cultivation Today

Continued on page 225



CALLISTEMON

For Horticulture, by R. Elliott and D. L. Jones
Reprint from Encyclopaedia of Australian Plants*

Low shrubs to trees; young shoots bearing silky hairs; leaves alternate, terete or narrow, entire, acute or acuminate, often leathery; inflorescence, small flowers arranged in bottlebrush-like spikes, showy, white, cream, yellow, pink, mauve, red or purple; sepals 5, deciduous; petals 5, orbicular, longer than sepals, green yellow, white, pink or red; stamens free, numerous, conspicuous, longer than petals, in 2-4 rows; fruits, globular to urn-shaped capsules, woody, forming dense spikes; seed retained in capsules, very fine, brown.

An endemic genus that contains about 25 named species, and several that are as yet undescribed. Their distribution includes the South Western Province of WA, where 2 species occur, SA, Vic, Tas, NSW, NT and Qld. In most cases they are found in areas of relatively high rainfall, and they often grow on the edges of streams or swamps.

Without doubt, all species are worthy subjects for horticulture. They produce terminal spikes of flowers, commonly called 'Bottlebrushes' because of their shape, some of the many spectacular Australian flowers.

Callistemons have proved to be very hardy and adaptable under a very wide range of soils and climatic conditions. Some, e.g. *C. 'Harkness'*, grow well in alkaline soils, where others may suffer from yellowing of leaves. Most will grow in the poorest of soils, and withstand waterlogging for extended periods. Generally they are tolerant of frosts, and withstand moderate coastal exposure. Many are capable of surviving through extended dry periods, but they do best in moist soils, and appreciate summer watering.

Applications of slow release fertilizers in autumn and spring will promote good growth, and this can result in two flowering periods, one near the end of the year, and the other about 4-5 months later.

There have been many *Callistemon* cultivars introduced over a long period of time. Flower colours not common in natural species of the genus, such as mauves, burgundy and purple have been produced. All cultivars must be propagated vegetatively to maintain the characteristics of the clone.

Because of their proven hardiness and their beauty, callistemons have a wide application in horticulture and the landscape. They are excellent for private and public gardens, farms, roadsides, industrial and commercial sites. The planting of groups of different coloured species produces an outstanding effect. Many species are suitable for use as small street trees, e.g. *C. salignus*, *C. shiressii* and *C. viminalis*, and by removal of the lower lateral growth, they can be grown on a clean trunk. Some species are excellent for attracting nectar-eating birds, e.g. *C. citrinus*, *C. rigidus* and *C. viminalis*.

Callistemons respond well to pruning. Dense growth can be achieved by pruning each year behind the spent flowers. This has the added benefit of producing new growth and an increased number of flowers the next season.

* This article has been reprinted from Volume 2 of "Encyclopaedia Of Australian Plants" by Rodger Elliott and David Jones with permission, to give readers an accurate guide to the breadth of coverage of the volumes of this series. Volume 2 will be available from the Editor, Australian Plants for \$45.00 post free, from April, 1982. In addition to the section on *Callistemon* reprinted above, is a schedule listing all the *Callistemon* species described, their principal characters and their probable relationships. It must be evident from the above, that as all flowering plants in the Australian Flora (of horticultural value) are to be described in a similar manner; these volumes are of considerable value. In fact no other book of the past has even approached the extent and competence of the coverage. If you have not already purchased your copy of Vol. 1 do so immediately, by sending \$35.00 for a copy to be mailed post free.





***Callistemon paludosus* — weeping form (Above)** Photography by D. L. Jones

Used as a street tree in the eastern suburbs of Melbourne this medium shrub to small tree would grace anybody's garden. Normally found beside rivers or swamps in areas of N.S.W., Vic., Tas. or S.A., it is a very hardy adaptable plant that will tolerate dry situations but responding best in moist soils with partial to full sun.

***Callistemon macropunctatus* — mauve form (Top left)** Photo by D. L. Jones

Normally rose-red with gold anthers the mauve flowered form of this shrub to 2.4 m is attractive and hardy. It has been sold as *C.* 'Violaceus' and as such has been widely cultivated. It responds well to moist soils and partial or full sun but will withstand waterlogging, frost and moderate coastal exposure.

***Callistemon pallidus* — yellow form (Bottom left)** Photography by R. Elliott

A good yellow form of this species provides a welcome contrast when planted with other red flowered species. It also grows in moist soils with partial or full sun and is frost tolerant, withstanding wind, water logging and moderate coastal exposure. A shrub to 2.5 m high with flower spikes to 10 cm x 5 cm, it occurs naturally in NSW, Vic., and Tasmania.

PROPAGATION OF *CALLISTEMON**

Volume 1 in the "Encyclopaedia Of Australian Plants", has an excellent chapter on methods of propagation of all plants and gives precise details of how to grow plants with fine seed such as those of *Callistemon*. By following the simple, but detailed directions, the production of innumerable bottle brush plants is assured for the reader of any age, no special facilities being necessary. Following is a summary.

The most common method of propagation is from seed. It takes about 12 months from the time of flowering for seed to reach maturity. In the majority of species, the seed is retained in capsules on the plants for many years. When collecting it is best to choose capsules that are on old wood.

Capsules should be stored in a dry container, e.g. a paper or cloth bag, and placed in a warm situation. As they dry they will open, and the very fine seed is released.

Seed must be sown on a well drained medium, and barely covered with a light material such as sieved sand. Keep moist until germination occurs. Another successful method of germinating seed is the 'Bog Method'.

If seed is sown too thickly it can result in the germination of many small, weak seedlings. To maintain a light, even spread of seed, dry sieved sand can be added to the seed before sowing.

As callistemons hybridise readily, it cannot be guaranteed that plants propagated from seed will be the same as the parent plant.

Plants can be propagated from cuttings, using firm new growth. The addition of a rooting hormone is beneficial. Some species can be difficult to strike, e.g. *C. paludosus* pink-flowered forms, whilst others such as *C. pallidus* strike readily. Good results have been gained with the use of mist and bottom heat. This genus could also be suitable for propagation under constant mist.

***Callistemon acuminatus* Cheel**

(sharply pointed) NSW — 1-3.5 m x 1-3.5 m Sept-Dec; also sporadic

Medium to tall shrub; young shoots silky hairy; leaves 7-11 cm x 1-2 cm, broad-lanceolate, acuminate, with very prominent venation, oil dots few, chiefly near the mid-vein, the margins sometimes undulate; flower-spikes 6-10 cm x 5-5.5 cm, dark crimson, dense, with large (2 cm long) persistent bracts, anthers gold; capsules 0.4-0.8 cm across, globular, with 5 distinct lines.

A striking species usually found on dry, rock cliffs and mountain sides. Readily distinguished by the persistent bracts on the flowers, and the leaves with undulate margins, prominent veins, and few oil glands. Adaptable to cultivation where it is very hardy tolerating a dry position although growing best if watered. Frost hardy and withstands some coastal exposure. Propagate as for the genus.

***Callistemon brachyandrus* Lindl.**

(short stamens) NSW, Vic, SA 1-5 m x 1-3 m Dec-April; also sporadic

A dense, small to tall shrub; young shoots grey, silky; leaves to 4 cm long, terete or channelled above, rigid, pungent pointed; flower-spikes to 4 cm x 2 cm, flowers loosely arranged; stamens orange-red; anthers gold; petals about 0.4 cm diameter, greenish; capsules woody, globular, about 0.7 cm diameter.

This species is excellent for hot climates, and has also proved very adaptable in other regions. It will grow in most soils, and does best in full sun. It is relatively drought tolerant and frost hardy. Plants flower for about 6-8 weeks. Because of the prickly foliage, it is ideal as a refuge plant for birds, and can help to restrict pedestrian traffic in strategic areas. Suitable for use in roadside planting. Propagate from cuttings or seed.

A dwarf form which flowers for an extended period is now available, and should prove to be a very worthwhile addition to cultivation.

Another form recorded as being in cultivation is *C. brachyandrus* 'California'. This is larger in most respects than the typical form.

* Readers are also referred to the series on page 231 of this issue, especially the first in the series in Issue No. 86, and to page 220.

***Callistemon chisholmii* Cheel**

(after Mr. J. R. Chisholm) Qld — 2-4 m x 1-1.5 m

May-August

Medium slender, sparse shrub or occasionally small tree; bark dark fibrous; young shoots silky; leaves 5-10 cm x 0.4-0.7 cm, linear-lanceolate, leathery, dark green, often falcate, oil glands numerous, the tips acuminate often pungent; flower-spikes 6-8 cm x 2-3 cm, dark red, fairly dense; capsules about 0.4 cm long, cylindrical, truncate, deeply sunken centre.

A little-known species found along creek banks in sandstone country of central western and northern Qld. It is not widely grown and usually has a sparse, open growth habit with willowy branches. It is very hardy to dryness and is well suited to inland conditions although it can also be grown in moister coastal regions. It has proved hardy in cultivation but does not match other species and cultivars for beauty, and is mainly for the enthusiast. Propagate from seed. Australian Plants, Vol. 8, page 145 for colour plate.

***Callistemon citrinus* (Curtis) Skeels**

Crimson Bottlebrush

(lemon-scented) NSW, Vic — 2-8 m x 2-6 m Sept-Dec, and often March-April

Medium shrub to small tree; branches numerous, can be arched or pendulous; young shoots pink or red, silky; leaves to 10 cm x 2 cm, tapering at both ends, pointed but not pungent, indistinct veins, margins nerve-like; flower-spikes to 12 cm x 6 cm, profuse, stamens bright crimson, rarely white, anthers dark, petals to 0.6 cm, greenish or reddish, open arrangement of flowers; capsule woody, globular, about 0.7 cm wide.

A well-known species in cultivation, with many different forms which are perpetuated as cultivars from cuttings. Will grow in almost any soil type or situation, doing best in partial or full sun. Withstands water-logging and is relatively frost tolerant. Will withstand moderate coastal exposure. Can be pruned heavily if required. Excellent for private and public gardens, roadsides or farms. The species does not have a significant lemon fragrance, as the specific name would suggest. This species hybridizes freely with other species and forms and the progeny are extremely variable. Some of these have been selected as cultivars and are useful in cultivation but many are best discarded. The typical form is propagated from seed and selected forms and cultivars from cuttings. Australian Plants, Vol. 10:4 for photograph.

C. 'Anzac' — a cultivar with flower-spikes that can be up to 15 cm x 6 cm. They are white, or can have a slight tinge of pink. Plants have a low sprawling growth habit to 1 m x 3 m. Flowering mainly occurs Nov-Jan.

C. *citrinus* 'Australflora Firebrand' — a form with spreading, arching branches, prolific red flower-spikes, and silvery-pink new growth after flowering. It grows 1.5-2 m x 3-4 m and flowers Oct-Dec. Aust. Pl. 11:31 for desc. and photo.

C. 'Clusters' — an upright dense shrub to 4 m tall with clusters of 6-8 flower-spikes at the ends of the branches in spring. The flower-spikes are 10-15 cm long and are a pinkish-red colouration.

C. 'Lana' — this cultivar is vigorous with a compact growth habit 3-5 m x 3-4 m. It has red brushes and flowers mainly Nov-Jan with others sporadically through the year. It should adapt to a wide range of conditions. Appreciates summer watering.

C. 'Lilacinus' — a much branched tall shrub to small tree growing 3-6 m x 4-5 m. The flower-spikes are light purple and may be up to 10 cm x 6 cm. They are borne in profusion from Nov-Feb and sporadically at other times. Plants of this cultivar were raised from seed collected in 1913 from plants labelled as *C. lanceolatum* var. *lilacina*, in the Botanic Gardens, Berlin. Mr. E. Cheel believed that it should be raised to specific rank as *C. lilacinus*, however this name is now no longer recognised botanically and the plant is regarded as a cultivar.

C. 'Lilacinus Albus' is similar to the cultivar 'Lilacinus' but differs in having creamy white stamens very faintly tinged with pink.

C. 'Lilacinus Carminus' is similar to the cultivar 'Lilacinus' but has deep reddish purple flower-spikes.



Callistemon comboyensis (Description opposite)

Photography by R. Elliott

C. 'Pink Clusters' — a medium dense shrub of 2-3 m x 2-3 m. The leaves are about 4 cm x 0.8 cm, lanceolate, ending in a short, slightly pungent point. New growth is hairy becoming glabrous with maturity. The pink flower-spikes of about 8 cm x 4 cm are usually in terminal clusters. Very adaptable to a wide range of soil and climatic conditions.

C. citrinus 'Splendens' — a vigorous cultivar originally selected in New Zealand. It has a dense growth habit and reaches 4 m x 4 m. The leaves are 8-10 cm x 2-2.5 cm, lanceolate stiff and deep green. The flower-spikes are brilliant crimson and up to 12 cm x 8 cm. It is popular and adaptable to a variety of situations in sub-tropical and temperate regions. Tolerates coastal exposure and makes an excellent hedge plant. Popular in New Zealand and the most commonly grown *Callistemon* in California, USA, where it flowers more or less continually throughout the year. The cultivar 'Endeavour' is identical to this form in all respects. Cuttings strike more readily than other forms of *C. citrinus*.

C. 'Summer Citrinus' — a medium to tall shrub, with a good display of crimson red flower-spikes during Dec-Feb.

***Callistemon coccineus* F. Muell. = *C. macropunctatus* (Dum-Cours.) A. B. Court.**

***Callistemon comboyensis* Cheel**

Cliff Bottlebrush

(after the Comboyne River) — Qld. NSW — 2-4 m x 1-1.5 m

Small to medium erect or straggly bush; young shoots pink, silky hairy; leaves 5-9 cm x 1-1.5 cm, pale green, lanceolate, often twisted or recurved, with numerous oil dots; flower-spikes 4-6 cm x 3-5 cm, rich red to crimson-purple or occasionally pink; capsules rounded, woody, pale brown, crowded.

Restricted to mountains of north-eastern NSW and south-eastern Qld, usually in exposed rocky situations but also along creek banks. Distinguished by the broad, thick-textured, leathery leaves bearing numerous oil dots. It is very straggly in nature but plants in cultivation are much more bushy. Becoming fairly popular in cultivation where it has proved adaptable to a variety of positions and soil types although it generally requires free drainage. Grows into a small, rounded bush and is hardy in southern Australia. Propagate as for the genus.

A prostrate form has been selected and is grown mainly in Qld. It forms a sprawling ground cover about 0.5 m tall x 2-3 m across but is usually sparse and flowers poorly. Heavy pruning is recommended if a dense cover is desired. It strikes fairly readily from cuttings of semi-hardened growth.

***Callistemon flavovirens* Cheel**

Green Bottlebrush

(yellowish green) — Qld, NSW — 1-3 m x 0.5-2 m Nov-Jan; also sporadic

Small to medium shrub; young shoots grey, silky hairy; leaves 3-10 cm x 0.4-1.0 cm, lanceolate, pointed, dark green, with conspicuous raised oil glands; flower-spikes 2-8 cm x 1-2.5 cm, yellowish-green or green, compact; capsules 0.6-0.8 cm across, globular, truncate, contracted at apex.

A little-known species from the Darling Downs area of southern Qld and northern NSW, usually in rocky situations along creek banks or in crevices. The yellowish-green flowers show at their best on dull days and in semi-shaded situations. Adaptable to cultivation where it is hardy tolerating a wet or dry position. Suitable for shaded situations. It is inclined to be straggly unless pruned regularly. Propagate as for the genus.

Callistemon* aff. *flavovirens

NSW — 1-3 m x 1-2 m

Oct-Dec

Small to medium shrub; leaves 3-6 cm x 0.4-0.6 cm, lanceolate, pointed, dark green; flower-spikes 2-4 cm x 1-1.5 cm, yellowish-green, clustered; capsules 0.6-0.8 cm across, globular.

An apparently undescribed species closely related to *C. flavovirens*, but differing by the smaller flowers, the flower heads borne in clusters and the sparsely hairy stamens. It is apparently confined to the Torrington area of NSW. It is not well known in cultivation and requires conditions similar to *C. flavovirens*. Propagate as for the genus.

***Callistemon formosus* S. T. Blake**

Cliff Bottlebrush

(beautiful) Qld — 3-5 m x 2-4 m

Aug-Oct

Tall shrub or small tree; bark dark brown, hard; young shoots bright red; branches pendulous; leaves 4-8.5 cm x 0.5-1 cm, narrow-elliptical, rigid, pointed at the apex, with roughened margins; flower-spikes 3-8 cm x 3-3.5 cm, pale yellow to white or red; capsule rounded, blunt, truncate.

Restricted to exposed rocky bluffs near Kingaroy. Similar in general appearance to *C. salignus* but with hard, dark bark, copiously dotted leaves and larger more rounded fruits. Flowering is restricted to spring in nature but some plants in cultivation flower almost continuously. Little known in cultivation but is proving adaptable. A hardy ornamental shrub suitable for inland areas. Slow growing in southern Australia and sensitive to heavy frosts. Selections and hybrids are little known in cultivation as yet. A red flowered form has been selected and is sold as 'Rubra' and a form with bright pink new growth and tomato red brushes is sold as 'Pink Tips'. The new growth of the white flowered form is also bright red and showy. Propagation as for the genus.

***Callistemon lanceolatus* DC. = *C. citrinus* (Curtis) Skeels**

***Callistemon linearifolius* DC.**

(linear leaves) NSW — 2-4 m x 2-5 m

Oct-Feb

A spreading open medium shrub; branchlets with silky hairs; leaves to 14 cm x 1 cm, tapering at both ends, concave to flat, midrib prominent on under-surface, ending in a sharp point, lateral veins visible, margins wavy and thickened, long silky hairs on under-surface of young leaves; flower-spikes 6-12 cm x 5-6 cm, relatively open arrangement of flowers; stamens bright red; anthers yellow; capsules woody urn-shaped, 1 cm dia., aperture restricted.

Until recently this excellent bottlebrush was not widely cultivated. Like most other species it is very adaptable, and should grow in most soils, doing best in partial or full sun. It is frost, and relatively drought tolerant, and withstands wind and moderate coastal exposure. Pruning will produce dense growth if required. For gardens, roadsides, farms and suitable as a low wind-break. Propagate from seed or cuttings.

***Callistemon linearis* DC.**

(linear) — NSW — 2-4 m x 3-5 m

Narrow-leaved Bottlebrush

Oct-Feb

A dense to open, medium shrub; branches numerous; leaves to 12 cm x 0.5 cm, concave or flat, mid-rib ending in sharp point, many small oil glands, rigid, thick, sometimes twisted or curved; flower-spikes to about 12 cm x 6 cm, arrangement of flowers fairly dense; stamens dull red; anthers gold; pistil longer than stamens; capsules woody, more or less globular, flat topped, about 1 cm diameter, densely arranged along branches.

This callistemon has been widely cultivated for a long time. It is hardy and adaptable to most soils and climatic conditions. Withstands waterlogging, winds, moderate coastal exposure and is relatively frost tolerant. Pruning will promote dense growth. Recommended for a wide range of horticultural uses. Propagate from seed or cuttings. Aust. Plants Vol. 10:9 for photograph.

A form sold as *C. linearis* 'Var. Pumila' is available. It has all the characteristics of the typical species, but supposedly retains a dwarf form. It is not a true botanical variety, but is a form selected for cultivation.

***Callistemon lophanthus* Sweet**

(flowers plumed) — NSW — 3-5 m x 2-4 m

Crested Callistemon

Oct-Dec

Medium to tall shrub; bark papery, cream; branches upright, slender; leaves about 5 cm x 1 cm, lanceolate, ending in sharp point, hairy when young, becoming glabrous, pale green but can be glaucous; flower-spikes about 10 cm x 5 cm, cream to yellow, flowers not crowded; petals fringed with long white woolly hairs; capsules woody, globular, often hairy.

This species is not well known, and is evidently not currently in cultivation. It was however introduced to England via France in about 1820. Plants should adapt to a wide range of soil and climatic conditions. Propagate from seed or cuttings.

The species was initially confused with *C. salignus* in England, and consequently sold under that name.

***Callistemon macropunctatus* (Dum.-Cours). A. B. Court**

(large dots) — NSW, Vic, SA — 2-4 m x 2-4 m

Nov-March

An open to dense shrub; branches numerous; leaves 3-8 cm x 0.5 cm, tapering at both ends, tip ending in pungent point, rough surface due to prominent glands, green, midrib and margins thickened; flower-spikes to 10 cm x 5 cm, slightly open arrangement of flowers; stamens rose red; anthers gold; petals about 0.7 cm long, pink; capsules woody, globular, to 1 cm dia.

This hardy species is widely cultivated, and will grow in most soils, with partial or full sun. It withstands waterlogging, frost, and moderate coastal exposure. It is inclined to become straggly, however pruning will create dense plant. Propagate from seed or cuttings.

Plants with similar foliage and mauve-purple flower-spikes are sold under the name of *C. 'Violaceus'*. This is thought to be a colour form of *C. macropunctatus*. It is very showy, well worth inclusion in gardens, and also performs very well as a roadside plant. Colour plate on page 200.

The var *laevifolius* (F. Muell. ex Miq.) Eichler is a shrubby form of spreading habit, with leaves 2.5 cm x 0.5-1 cm, broadly lanceolate, but blunt with a small mucro at the apex. The flower-spikes are similar to the reddish form. It occurs naturally in the Port Lincoln-Spencer's Gulf area of SA. There is a fine plant of this form in the Melbourne Botanic Gardens, labelled as '*C. coccineus* var. *splendens*'.

***Callistemon montanus* F. M. Bail.**

Mountain Bottlebrush

(growing on mountains) — Qld, NSW — 2-4 m x 1-2 m

Sept-Nov

Small to medium-sized erect or sprawling shrub; young shoots pink, hairy; leaves 4-7 cm x 0.2-0.5 cm, narrow-lanceolate to oblanceolate, crowded, blue-green above, glossy green beneath, lacking oil dots; flower-spikes 3-5 cm x 4-6 cm, bright red; capsules obovoid, elongated, woody, deflexed.

Restricted to mountain habitats of the Whian Whian State Forest, Lamington Plateau and Mt. Maroon, usually on or near cliff faces. Distinguished by the difference in colour between the upper and lower leaf surfaces, the lack of oil dots and the long, deflexed capsules. Flowering occurs in two flushes, the main one in spring and the other in autumn. Little known in cultivation, however it has proved adaptable to a variety of positions and soil types. Plants are very bushy and produce flushes of growth and flowers following periods of substantial rain. Very tolerant of cold conditions and will withstand considerable exposure to wind. Flushes of new growth are very showy being pink to bronze-red and enhance the bushes considerably.

***Callistemon pachyphyllus* Cheel**

Wallum Bottlebrush

Qld, NSW — 0.5-3.5 m x 0.5-1.5 m

Sept-Dec; March-April

Small erect, rigid straggly shrub; leaves 3-6.5 cm x 0.3-1.5 cm, oblanceolate, dull-green, thick-textured, stiff, held upwards, blunt; flower-spikes 6-10 cm x 4-6 cm, terminal, bright red; capsules rounded, woody, grey-green, retaining the seeds.

Commonly found in the sandy coastal heath country known as Wallum, between Byron Bay and Fraser Island. A low straggly species which may grow in extensive stands. Distinguished by its rigid habit and thick-textured oblanceolate leaves. Flowering occurs sporadically throughout the year with flushes in the autumn and spring, particularly after substantial rains. It has been grown for many years but is not common in gardens even in Qld. A very hardy species which will tolerate a wide variety of conditions including frost and is useful for coastal planting. Can be successfully grown in southern Australia. Heavy pruning is necessary at regular intervals.

The var. *viridis* is a green flowered form which occurs naturally throughout the range of the red form although often growing in drier situations. It has attractive and unusual flowers, very narrow leaves and can be propagated by seed or cuttings. It has weeping branches and grows about 2 m tall. A form with reddish-like brushies is sometimes grown under the name *C. pachyphyllus* 'Rubro-lilacinus'. A salmon-pink flowered form known as *C. pachyphyllus* 'Smoked Salmon' is described as a cultivar in Aust. Plants 11:31.

***Callistemon pallidus* (Bonpl.) DC.**

Lemon Bottlebrush

(pale) — NSW, Vic, Tas — 2-5 m x 2-5 m

Sept-Jan

A dense, medium to tall shrub; young shoots silvery or reddish, covered in silky hairs; branches numerous slender, can be slightly pendulous; leaves 5-10 cm x 0.5-2 cm, tapering to both ends, dense oil glands, glabrous when mature, grey-green to green; flower-spikes to 10 cm x 5 cm, semi-open arrangement of flowers; stamens cream to greenish yellow; anthers yellow; petals about 0.5 cm long, pale yellow; capsules woody, globular, about 0.7 cm diameter.

This widely grown, most ornamental species has adapted extremely well to cultivation. It grows in most soils, with dappled shade, partial sun or full sun. Frost tolerant, and withstands wind, waterlogging and moderate coastal exposure. Highly recommended for gardens, roadsides, farms and windbreaks. The flower colour provides a pleasant contrast to other callistemons, which flower at the same time. Propagate from seed or cuttings.

A form known as *C. pallidus* 'Austraflora Candle Glow' with lemon brushes of about 7.5-10 cm long has a low spreading growth habit. This has recently been introduced into cultivation.

C. 'Clearview Father Christmas' is a form of *C. pallidus*. The flower-spikes are about 11 cm x 3.5 cm, with off-white stamens and red anthers. They are usually arranged in terminal clusters. Plants may not flower regularly each year. Australian Plants Vol. 11:32 for a colour plate.

An undescribed species with mauve-purple flower-spikes, from East Gippsland, Vic, has been sold as a form of *C. pallidus* — see *C. species* (Mt. Drummer). See the colour plate on page 200.

Records indicate that another purple-flowered form occurs in the Avon River area of East Gippsland. This may prove to be a separate species.

***Callistemon paludosus* F. Muell.**

River Bottlebrush

(growing in swamps) — NSW, Vic, Tas, SA — 3-10 m x 2-6 m Nov-May

Medium shrub to small tree; branches numerous, slender, often pendulous; leaves 3-10 cm x 0.6-0.8 cm, tapering to both ends, prominent midrib ending in a fine point, young growth silky, mature growth more or less glabrous, grey-green to green; flower-spikes 6-8 cm x 2-3 cm, open arrangement of flowers; stamens cream or pink; anthers yellow; petals 0.3 cm long, greenish; capsules woody, globular, about 0.5 cm diameter.

Although often its natural habitat is in and beside rivers, *C. paludosus* is a very hardy and adaptable species, even tolerating dry situations. It will grow best in moist soils, with partial or full sun. Frost tolerant, and withstands exposure to wind and waterlogging. Ideal for gardens, roadsides and farms. Propagate from seed or cuttings. See the colour plate on page 201.

One selected form has soft pink brushes, and pendulous branches. This has been used as a very effective street tree in eastern suburbs of Melbourne.

A form of *C. paludosus*, commonly resulting from plants raised from seed, is sold as *C. salignus* 'Rubra'. It usually grows as a multi-stemmed shrub of 3-5 m x 2-4 m. The flower-spikes can be various shades of pink. They are produced mainly during February-March, but can also be sporadic.

***Callistemon phoeniceus* Lindl.**

Lesser Bottlebrush

(from the Phoenician dye) — WA — 2-4 m x 3-5 m

Aug-Jan

A medium shrub; branches numerous, can be slightly pendulous; leaves 4-10 cm x 0.5-1 cm, thick, rigid, sometimes twisted, prominent midrib and nerve-like margins, greyish green; flower-spikes to 12 cm x about 5 cm, open arrangement of flowers; stamens bright rich red; anthers usually dark coloured; capsules woody, globular, in dense spikes.

A very hardy and adaptable species which will grow in most soils. It prefers full sun. In cultivation plants are very ornamental, with brilliant red heads of flowers. Ideal for gardens, roadsides, low windbreaks and screening. Relatively frost and drought tolerant. Plants flower for about 8-10 weeks. Propagate from seed or cuttings. Australian Plants, Vol. 10:4 for photograph.

Also in cultivation is a low growing form, usually sold as *C. phoeniceus* 'Prostrate'. It reaches about 1 m in height, and covers an area to about 3 m across. The form is very useful for embankments, and as a ground cover. Fairly hard pruning when the plants are young will promote dense central growth. The form must be propagated from cuttings.

Seed of a salt tolerant form has appeared on commercial seed lists. This could prove to be highly suited to both inland and coastal conditions.

***Callistemon pinifolius* DC.**

(foliage similar to genus *Pinus*) NSW — 0.5-4 m x 2-4 m

Sept-Dec

A low spreading, or upright open shrub; leaves to 10 cm long, linear, channelled above, often terete, ending in a sharp point; flower-spikes to 8 cm x 4 cm, compact arrangement of flowers; stamens yellowish, green or dull red; anthers yellow; capsules woody, globular.

A variable species which occurs in a number of forms, all desirable subjects for cultivation. Two forms have yellow-green flowers, one with an upright growth habit, and the other low and spreading. The red flowered form is usually an upright plant. All forms are hardy and adaptable and will grow in almost any conditions, including poor soils. They are relatively frost tolerant, and withstand waterlogging as well as moderate coastal exposure. Pruning is necessary to promote dense growth. Suitable for a wide range of horticultural and landscaping uses. Propagate from seed or cuttings.

***Callistemon pityoides* F. Muell. = *C. sieberi* DC.**

***Callistemon polandii* F. M. Bail.**

(after Rev. W. Poland) — Qld — 2-5 m x 1-3 m June-Aug

Medium to tall shrub; young shoots densely silky hairy; leaves either 8-15 cm x 2-4 cm, ovate-lanceolate, stiff, spreading, light green, bearing numerous oil dots, the midrib prominent, the margins thickened, or 6-8 cm x 1-1.5 cm, bright green, lanceolate, crowded, often cupped; flower-spikes 6-10 cm x 4-5 cm, bright red; capsules 0.6 cm across, globular, crowded.

Two distinct forms of this species are known to be in cultivation. The most common of these is a popular subject in Brisbane and has silvery pink to bright red flushes of new growth and oblanceolate leaves 6-8 cm x 1-1.5 cm. It has a dense growth habit and produces showy heads of bright red flowers at intervals throughout the year. It is well established in cultivation and has proved to be a hardy and rewarding subject for warm areas. It grows about 4 m tall and apparently originates in the Port Curtis district of central Qld. Superior forms have been selected and are being promoted in tropical areas such as Townsville and Rockhampton. One selection produces masses of flower spikes on successive flushes of growth.

The second form which may be the true form is not widely known in cultivation and in nature is restricted to a couple of small areas of the Cook district in far northern Qld. It has very large (8-15 cm x 2-4 cm) stiff, spreading ovate-lanceolate leaves and showy bright red flower-spikes up to 10 cm x 5 cm. Flushes of new growth are purplish-red and very showy. It grows 5-6 m tall and is a fairly slow growing species that may become straggly unless pruned regularly. Suited to cultivation in tropical areas and hardy but slow growing in southern Australia. The large leaves are unique in the genus. Propagation as for the genus. Aust. Plants 8:145 for photograph.

***Callistemon rigidus* R. Br.**

Stiff Bottlebrush

(rigid) — Qld, NSW — 1-2.5 m x 2-4 m

Nov-Jan

Small to medium shrub; young shoots covered with silky hairs; leaves 0.5-1.5 cm x 0.3-0.6 cm, linear-lanceolate, dull green, bearing numerous small dots, the veins forming ridged margins; flower-spikes 2-5 cm x 1-2.5 cm, deep red; capsules about 0.3 cm across, rounded.

Widespread in damp places from northern Qld to southern NSW. Distinguished by the small leaves with ridged margins formed by the veins. A small rigid species not common in cultivation. Useful in a wet position but will also tolerate dryness. May be slow growing. The best forms have very dark red, long lasting flowers. 'Crimson Spokes' is a cultivar which bears large brushes (to 12 cm x 5 cm) in clusters of 4-6 at the ends of branchlets. The brushes are stalkless and radiate like the spokes of a wheel. It does not appear to be well known in cultivation at this stage.

***Callistemon rugulosus* DC. = *C. macropunctatus* (Dum.-Cours.)**

A. B. Court

***Callistemon salignus* (SM.) DC**

Pink Tips; Willow Bottlebrush

(Willow-like) — Qld, NSW, SA — 5-15 m x 3-5 m

Sept-Dec

Tall shrub to medium tree; bark white, papery; leaves 6-10 cm x 0.2-0.4 cm, narrow-lanceolate, pointed, pale green, with conspicuous venation and numerous oil dots; flower-spikes 3-5 cm x 2-3.5 cm, commonly greenish or white but also pink, red or mauve, compact; capsules small, rounded, woody, not retaining the seeds.

A widespread and common species found along the banks of streams and swamps but also extending to dry rocky montane situations. Distinguished by the white papery bark and the narrow-lanceolate pointed leaves. Flowering is mainly confined to the spring and early summer.

The species is popular in cultivation and widely grown for a variety of purposes. An excellent small tree suited to the home garden and adaptable to a variety of soils and positions. Very hardy and drought resistant. Makes a very attractive and useful street tree and is becoming widely planted for that purpose. Flushes of new growth are bright pink or even reddish and are a very decorative feature of the species.

Callistemon salignus is variable and a range of forms are available for cultivation. The var. *roseus* C. T. White from Qld is a pink flowered form which is particularly desirable but as yet is not widely known. Red and mauve flowered forms have also been selected and are propagated vegetatively. The red one is sometimes sold as *C. salignus* 'Rubra' and the white flowered form is sometimes listed as *C. salignus* 'Albus'. An excellent free flowering form selected near Brisbane is a worthy garden plant. Commercial batches of seed of *C. salignus* 'Rubra' are often contaminated with a bottlebrush which is probably a form of *C. paludosus*. It is a compact multistemmed form which flowers mainly in Feb-March with slender pink brushes. The var. *australis* Benth. is distinguished by its smaller leaves (2.5-5 cm) and glabrous calyx. It is found in SA but its status is uncertain.

Callistemon* aff. *salignus

NSW — 5-10 m x 2-4 m

Sept-Dec

Tall shrub or small tree; bark white, papery; leaves 6-10 cm x 0.2-0.4 cm, narrow-lanceolate, pointed, pale green, with fewer lateral veins and less oil dots than in *C. salignus*; flower-spikes 3-5 cm x 2-3 cm, white, compact, with stouter filaments and longer anthers than in *C. salignus*; capsules small round, woody, retaining the seeds.

An apparently undescribed species closely related to *C. salignus*. It is confined to NSW where it occurs on the slopes and tablelands of the central zone. It is not well known in cultivation and requires conditions similar to *C. salignus*. Propagate as for the genus.

***Callistemon shiressii* Blakely**

(after D. W. C. Shiress) — NSW — 4-9 m x 3-4 m

Sept-Jan

Tall shrub or small slender tree; bark papery, cream; young shoots softly hairy; leaves 2-4 cm x 0.5-0.8 cm, narrow lanceolate, acuminate, pungent, light green, often with undulate margins; oil dots numerous; flower-spikes 3-5 cm x 2-4 cm, white or cream, dense, the stem woolly; capsules about 0.4 cm across, globular, constricted near the top.

A hardy species found on steep shaly ridges of central northern NSW. Easily recognised by the strongly veined light green foliage with numerous oil dots and the woolly stems of the flower spikes. A handsome species useful for a variety of purposes including lawn specimens and for street planting. May be slow growing but is very long-lived. Foliage tips are bright red. Does very well in heavy clay soils and will grow successfully under established eucalypts. Quite drought resistant but looks better with applications of water. Propagate as for the genus.

***Callistemon sieberi* DC.**

(after F. W. Sieber) — Qld, NSW, Vic — 1-5 m x 1-5 m

Alpine Bottlebrush

Nov-Feb

An erect to spreading, dwarf to tall shrub; branches numerous; leaves 1.5-4 cm x 0.2-0.5 cm, pungent pointed dense along branches, new growth usually silky, mature growth glabrous; flower-spikes 2-15 cm x 2-3 cm, compact arrangement of flowers; stamens cream to yellow; petals about 0.4 cm long, creamy yellow; capsules woody, globular, about 0.8 cm diameter.

This species is commonly a dweller of alpine and sub-alpine areas, however it also occurs in marshy conditions on the Darling Downs, Qld. It is a most variable species in growth habit, foliage and flower. Forms from high altitudes are generally very compact, however some have proved difficult

to flower at low altitudes. The most commonly grown form has arching branches, with fine needle-like foliage. One particularly fine form has flower-spikes up to 15 cm long. It is a highly desirable shrub, and has proved adaptable to a wide range of soil and climatic conditions. Preference is for moist soils with partial or full sun. Frost tolerant. Withstands hard pruning. Propagate from seed, or from cuttings which strike readily.

***Callistemon speciosus* (Sims) DC.**

Albany Bottlebrush

(showy or handsome) — WA — 2-4 m x 1-3 m

Aug-March

An erect, stiff, medium shrub; branches upright; leaves to 15 cm x 2 cm, narrowed at base, rigid, spreading, prominent midrib ending in hard point, prominent veins and thick margins, dark green; flower-spikes to 15 cm x 7.5 cm, flowers arranged very densely; stamens deep red (rarely white); anthers gold; capsules woody, globular, in very dense cylindrical clusters.

This outstanding species has been in cultivation for many years in various parts of the world. It will grow in practically any position, but does best in wet to moist soils with full sun. Withstands waterlogging and is an excellent border plant for dams, soaks, ponds, etc. It is usually best to prune young plants hard if dense growth is required. Flowering period is commonly 6-8 weeks. Propagate from seed or cuttings. Aust. Pl. Vol. 10:1 for photo.

***Callistemon subulatus* E. Cheel**

(awl-shaped) — NSW, Vic — 1-3 m x 1-3 m

Nov-Feb; also sporadic

Much-branched small to medium shrub; branches often spreading; leaves to 5 cm x 0.4 cm, semi-terete to flat, tip can be sharp pointed, glabrous when mature, green; flower-spikes to 8 cm x 5 cm, crimson red, solitary or in clusters; petals green, orbicular; capsules about 0.3-0.5 cm diameter, squat, crowded.

A very adaptable and decorative species. Its natural habitat is usually along river and stream banks, but it will grow in most soils and climatic conditions. Withstands extended waterlogging, and limited dry periods. Suitable for gardens, parks, and container cultivation. There are at least two forms common in cultivation; one has narrow dark green leaves with deeper red flowers. Pruning after flowering will promote bushy growth. Propagate from seed or cuttings.

***Callistemon teretifolius* F. Muell.**

(terete leaves) — SA — 1-3 m x 2-4 m

Oct-Feb

An open small to medium shrub; leaves to about 10 cm x 0.1-0.2 cm, terete, or sometimes channelled on lower surface, pungent pointed, glabrous, green, young growth silky; flower-spikes to 8 cm long, flowers dense; stamens crimson; anthers purple; petals about 0.4 cm diameter; capsules woody, depressed globular, to 1 cm diameter. Aust. Pl. Vol. 5:333 for photograph.

Not as widely cultivated as many of the other species. Has a flowering period of about 8-10 weeks. It occurs naturally in the Flinders Ranges, and has proved to be adaptable to a wide range of soil and climatic conditions. Ideal for semi-arid areas and for best results needs a sunny situation. Propagate from seed or cuttings.

***Callistemon viminalis* (Soland. ex Gaertn.) G. Don ex Loud.** Weeping B-b
(long slender shoots) — Qld, NSW — 1-12 m x 1.5-5 m

Sept-Dec

Small shrub to a small bushy tree; branches arching or weeping, when young covered with silky hairs; leaves 2-6.5 cm x 0.5-1 cm, variable in size, spreading or nearly appressed, lanceolate, with numerous oil dots; flower-spikes 5-20 cm x 3-6 cm, terminal, bright red, the flowers fairly widely spaced; capsules cup-shaped, not retaining the seed after maturity.

Widespread and common along stream banks from the tip of Cape York Peninsula to the Clarence River. Usually distinguished by its weeping habit of growth and the fact that the base of the stamens are joined together into a ring and all are shed together as one unit. Flowering can also occur sporadically throughout the year with flushes in the autumn and

spring. The seeds of this species are shed annually from the capsules and are not held indefinitely as in most other species of *Callistemon*.

The species is very popular and widely cultivated throughout Australia for a variety of purposes. The flowers are rich in nectar and are bird attractive. It is adaptable to most soil types and positions although may be frost tender while small. For best results it prefers a sunny position with regular watering during dry spells. See Australian Plants 8:57 for photograph.

Numerous forms have been selected and are grown in various parts of Australia where they are best suited. The type form was collected from Cape York Peninsula and is a tall shrub with long red brushes and large spreading leaves. The tall forms are popular as street trees in northern areas but are usually propagated from seed and are variable. Poor forms with small sparse brushes are frequently seen. Cutting grown plants from selected forms prove much better. A fine leafed form with pink young growth and strongly weeping branches is becoming widely grown in Melbourne gardens and as a street tree. A dwarf form which is an excellent garden plant was raised as a chance seedling by Ken Dunstan of Altonville. Grows to about 1 m x 1 m, is very compact and dense. It has broad bluish leaves and short blood-red brushes. Becoming a popular shrub around Brisbane and Sydney.

'Captain Cook' — a widely grown dwarf selection forming a dense rounded bush to 2 m tall which may have a weeping habit. The brushes are red, fairly dense and are borne in clusters near the ends of branches. The main flowering occurs in the spring with a lesser flowering in autumn and odd flowers at intervals in between. Unfortunately in the early stages of the release of this cultivar a number of plants were raised from seed and sold as the selection and many of these were inferior to the original. This cultivar was sold earlier in the nursery trade as *C. viminalis* 'Compacta'.

'Dawson River' — a tall (to 10 m) slender weeping plant with pointed leaves. The crimson flower spikes are up to 12 cm x 5 cm and have bright yellow anthers. New growth is greyish green and hairy. Plants seem to be very adaptable with a preference for moist soils and full sun. Tolerant of light frosts. Also known as 'Dawson River Weeper'.

'Hannah Ray' — a strong weeping form with bright pink new growth and large pendulous crimson brushes. It grows into a small tree (to 4.5 m tall) useful for home gardens or as a street tree and is mainly grown around Sydney.

'Hen Camp Creek' — a medium shrub of 3-4 m x 2 m. The broad leaves are bluish-green when young. Red flower-spikes are produced in Sept-Nov and also March-May.

Creek 'Ku-ring-gai' — grown around Sydney and was selected by the Ku-ring-gai Council. It grows to about 4 m tall, with a weeping, open, graceful growth habit and numerous scarlet brushes.

'Luster Creek' — a selection of the large leafed type form from near Mount Molloy, Qld. The plants have an open, erect habit and grow to about 4 m x 2.5 m. Flushes of new growth are bright purplish-pink and deep red brushes 10-15 cm x 4-5 cm are borne near the tips of branchlets in spring.

'McGaskilli' — a vigorous, dense small tree growing to about 6 m tall. It has a weeping habit and masses of bright red brushes. It is very popular in California, USA, but does not appear to be available in Australia.

'Pindi Pindi' — a tall slender weeping form growing to about 6 m high. It has glabrous foliage and is usually the first of the *C. viminalis* forms to flower in the spring. It has open brushes of bright red flowers.

'Prolific' — a little-known selection growing to about 4 m tall. It has an upright growth habit, bright green leaves, and short (5-8 cm long) dark red open brushes in large clusters. Tolerant of light frosts.

'Rose Opal' — a dwarf form growing 1.5-2 m tall which originated as a deliberate selection from seed collected near Yandina, Qld. It has narrow leaves and bears deep red brushes which become rose-coloured with age. The bush is dense and the flower-spikes are borne in clusters at the ends of branches. There is usually one good flowering each year with sporadic flowers in between.

'Running River' — 0.5-1 m x 1-2 m, a dwarf shrub with soft hairy, bronze new growth. Remains quite dense and withstands dry conditions. Flower-spikes are deep red, 4-6 cm x 2-4 cm, sparse but in large clusters.

'Wild River' — a medium shrub (2-5 m x 2-3 m) with an open distinctive weeping habit and large leaves. The new growth is pinkish and the flower-spikes are 10-15 cm x 4-5 cm and deep red. It grows well in moist soil.

'Wollumbin' — a medium shrub (2-3 m x 1-1.5 m) with attractive salmon-pink flower-spikes (2-4 cm x 2-4 cm) in clusters at intervals throughout the year. The flowers are reputedly short lived but are of an attractive colour.

All selections must be propagated from cuttings.

***Callistemon viridiflorus* (Sims) Sweet**

Green Bottlebrush

(green flowers) — Tas — 1-3 m x 1-2 m

Nov-Jan

An upright to spreading, small to medium shrub; branches short; leaves about 3 cm x 1 cm, tapering to both ends, sharp pointed tip, arranged densely along branches, new growth often reddish; flower-spikes about 8 cm x 4 cm, fairly dense arrangement of flowers; stamens yellow-green; anthers yellow; capsules globular, about 0.8 cm diameter, woody, slightly warty or hairy.

A showy species that is very adaptable. It grows best in moist soils with partial or full sun. Will tolerate frost, wind, and waterlogging, and withstands hard pruning. Ideal for gardens, roadsides or farms, and is useful as a windbreak or screening plant. It is grown as a greenhouse plant in the UK. Propagate from seed, or from cuttings which strike readily.

***Callistemon* species (Baroondah)**

Baroondah Bottlebrush

Qld — 2-5 m x 1-2 m

Sept-Nov; also sporadic

Medium erect shrub to small tree; young shoots silvery, weeping; leaves 4-8 cm x 0.2-0.4 cm, narrow-lanceolate, stiff, dark green, with oil dots; flower-spikes 6-10 cm x 1.5-2.5 cm, pale pink or white, sparse or dense, profuse in terminal clusters; capsules narrow, blunt, woody.

An apparently unnamed species from the central southern area of Qld, along stream banks. Has a number of qualities which will make it a fine bottlebrush for cultivation including the weeping silvery foliage and long, slender delicate coloured brushes. Plants flower when very young and will grow in a wide range of soils but for best results prefer a sunny position and regular water during dry periods. Hardy but slow growing in southern Australia. Flowering may continue intermittently all year.

***Callistemon* species (Blackdown Tableland)**

Blackdown Bottlebrush

Qld — 1-1.5 m x 1-1.5 m

Aug-Nov

Small to medium open shrub; young shoots pale green or pinkish, hairy; leaves 1-2 cm x 0.2-0.4 cm, linear, rigid, dark silvery green, pungent and prickly, spreading; flower-spikes 4-6 cm x 3-5 cm, dark red with yellow stamens, dense terminal; capsules 0.4-0.5 cm across, rounded, woody.

An apparently undescribed species that is restricted to a couple of creeks and associated soils on the Blackdown Tableland where it grows in sandstone crevices. It is a compact shrub that is best suited to warm regions but well worth trying in colder districts since it will tolerate mild frosts. It is easy to grow in a variety of soils and situations but for best growth needs abundant water during dry periods. A most desirable plant. The bottlebrush sold as 'Ewan Rd' seems to be a form of this species.

***Callistemon* species (Bluff)**

Qld — 1-3 m x 1-2 m

Oct-Nov

Medium shrub with a sparse open habit; branches willowy, weeping; leaves 5-8 cm x 0.5-1.2 cm, lanceolate, dark green, spreading, widely spaced on the branches, the apex acuminate; flower-spikes 6-8 cm x 2-4 cm, cream, fairly dense; capsule blunt.

A little-known plant that may be an undescribed species. It has a distinctive open growth habit which makes it very useful when intermingled with other shrubs in a border or shelter belt. Has proved to be very hardy and is easily grown in a sunny situation in sub-tropical areas. Seems to be adaptable as to soil type growing well in heavy or light soils.

***Callistemon* species (Boreelah Creek)**

Qld — 1-3 m x 2-4 m

April; Sept-Nov

Medium shrub with a spreading habit; branches slender, willowy; leaves 1-2 cm x 0.2-0.5 cm, linear, dark green, stiff, appressed to the stem; flower-spikes 1-2 cm x 0.5 cm, pale pink when fresh, quickly fading to dirty white; capsules small, globular, crowded.

A little-known plant that may be an undescribed species. It is extremely hardy but has very little horticultural merit, the flower-spikes being small and unattractive. Will grow well in heavy soils. Propagation as for the genus.

***Callistemon* species (Boulia)**

'Boulia Bottlebrush'

Qld — 4-6 m x 1-2.5 m

Aug-Oct

Tall spreading shrub or small tree; trunk short, stout; bark grey, furrowed; leaves 3-5 cm x 0.4-0.6 cm, elliptical or linear-lanceolate, stiff, dark green, sometimes falcate; flower-spikes 2-6 cm x 3-6 cm, bright red, fairly dense, terminal profuse; capsules small, woody, clustered.

An apparently undescribed species from far western Qld where it grows alongside depressions and channels in heavy clay soils. It has proved successful in cultivation around Brisbane but up to this time little material has been available for distribution. It is very floriferous and is a desirable garden plant. Propagate as for the genus.

***Callistemon* species (Guyra)**

NSW — 2-5 m x 1-3 m

Nov-Jan; also sporadic

Medium to tall shrub; young shoots pink, hairy; leaves 8-14 cm x 0.5-1 cm, lanceolate, dark green acuminate, strongly pointed; flower-spikes 8-15 cm x 4-6 cm, pink to red, profuse, open not dense; capsules 0.6-0.8 cm across, rounded, widely spaced.

An apparently undescribed species that is fairly widespread on the New England Tableland of northern NSW. It is related to *C. citrinus* but has longer staminal filaments and styles, pungent leaves and fairly widely spaced fruits. It has been sold in nurseries as 'Guyra Hybrid'. It will grow in almost any soil type or situation. Withstands waterlogging and is very frost tolerant.

A *Callistemon* known as 'Candy Pink' is possibly a form of this species. It is becoming popular in cultivation because it flowers while quite small. The flowers open pink and age to a reddish pink. Flushes of flowers are produced throughout the year. Prefers a sunny position. Propagate as for the genus.

***Callistemon* species (Happy Valley)**

Happy Valley Bottlebrush

Qld — 2-5 m x 1-2 m

Oct-Dec

Medium to tall slender shrub; branches sparse, erect; young shoots pale green, silky; leaves 3-5 cm x 0.5-1.2 cm, elliptical or ovate-lanceolate, bright green, stiff, spreading; flower-spikes 5-7.5 cm x 2-3.5 cm, pale pink, dense, terminal, hardly profuse; capsules 0.5-0.7 cm across, rounded, woody, in dense clusters.

An apparently undescribed species from the Darling Downs of southern Qld, where it grows in dense thickets. It has been recently introduced into cultivation but little is known to date about its requirements. It is not spectacular in flower and is mainly for the enthusiast. Propagate as for the genus.

***Callistemon* species (Injune)**

Qld — 1-3 m x 1-2 m

All year

Medium to tall shrub; young shoots pinkish, silky hairy; leaves 2-4 cm x 0.3-0.5 cm, lanceolate, stiff; flower-spikes 2-4 cm x 1.5-2.5 cm, pale pink or red, dense; capsules small, woody.

A little-known plant which may be a natural hybrid or a distinct species. Two forms are known, one with erect growth and the other low and weeping. It is useful because of the masses of pale pink brushes produced in several flushes throughout the year. The pink fades to white with age and both colours may be present simultaneously. It grows easily doing best in a sunny position well supplied with water during dry periods. It is well suited to tropical and subtropical regions. Propagate as for the genus.

Callistemon species (Mt. Drummer)

Vic — 2-3 m x 2-3 m

Oct-Feb; also sporadic

Medium shrub, much-branched; leaves to 5 cm x 0.8 cm, flat, tapering both ends, tip with sharp point, very prominent oil glands, leathery, slightly grey-green, glabrous when mature, new growth densely covered with long appressed hairs; flower-spikes to 15 cm x 6 cm, light mauve-purple, terminal, solitary or in clusters; capsules about 0.7 cm diameter, globular, restricted aperture.

This apparently undescribed species was originally collected on the Princes Highway west of Mt. Drummer in East Gippsland. It is not widely cultivated, but has been available in nurseries as *Callistemon* 'Purpurea'. A very adaptable and showy species. It has affinities to *C. citrinus*, but is probably more closely allied to *C. pallidus*. Propagate from cuttings.

Callistemon species (Severn River)

Severn River Bottlebrush

Qld — 2-4 m x 1.5-2.5 m

Feb-April

Tall slender shrub; young shoots bronze; leaves 3-5 cm x 0.2-0.4 cm, elliptical or narrow lanceolate, dark green, spreading, often falcate; flower-spikes 5-8 cm x 2.5-3 cm, bright red with golden anthers, dense, terminal; capsules 0.3-0.4 cm across, rounded, woody.

An apparently undescribed species from the Darling Downs where it grows along stream banks. It has superficial similarities to *C. chisholmii*. It has been successfully introduced into cultivation and is becoming a popular garden subject in southern Qld. It may produce flushes of growth and flowers following periods of substantial rain. Propagate as for the genus.

Callistemon species (Stanthorpe)

Qld — 4-7 m x 3-5 m

Oct-Dec

Tall shrub or small dense tree; bark hard, fissured; leaves 1-2 cm x 0.3-0.5 cm, narrow lanceolate, stiff, acuminate, dark green, crowded; flower-spikes 1-3 cm x 0.5 cm, cream to yellow, dense, often borne in clusters at the end of branchlets; capsules small, globular.

A little-known plant that is apparently an undescribed species. It grows naturally in low lying country in the granite belt of south-eastern Qld, usually in heavy soils. It has a stiff dense growth habit and the pale flower-spikes contrast pleasantly with the dark green foliage. Has proved easy to grow in subtropical regions. Requires a sunny situation and is adaptable as to soil type. Very frost hardy. Propagation as for the genus.

Callistemon species (Tinaroo)

Tinaroo Bottlebrush

Qld — 1-5 m x 1-3 m

Chiefly Aug-Nov

Medium to tall shrub or small bushy tree; young shoots silky hairy; leaves 2-5 cm x 0.5-0.8 cm, elliptical or lanceolate, dark green, pointed, often crowded and overlapping, bearing numerous oil dots; flower-spikes 3-8 cm x 3-4 cm, dark red, dense, with conspicuous stamens; capsule narrow, rounded, blunt.

An apparently unnamed species from the ranges of the Atherton Tableland where it grows in rocky soakage areas. The bushes may be sparse or compact with a weeping or upright growth habit. Flowers are dense and showy and the new growth is red and colourful. The species has proved very hardy in cultivation being tolerant of dry conditions and coldness, and growing very successfully in southern Australia as well as in the subtropics. It is sometimes sold in nurseries as 'Tinaroo Dazzler' or 'Tinaroo Falls'. Propagate from seed or cuttings which are fairly easy to strike.

Callistemon Cultivars and Hybrids

There have been many cultivar names used over the years and the following section seeks to record those currently in use. Few of these plants have been formally registered as cultivars and, unless this is done, many of these names will die out. The official reports of the Australian Cultivar Registration Authority are published in Australian Plants. The next issue will feature the 1981 report and a new cultivar *Callistemon pallidus* 'Australora Candle Glow'.

CALLISTEMON CULTIVARS and HYBRIDS

Callistemon 'Adina'

Cultivar — 2-3 m x 1-2 m

Nov-March; also sporadic

A garden hybrid probably involved *C. pachyphyllus* as one parent and possibly *C. citrinus* as the other. The plants are of open habit with new growth pink and bearing silky hairs. The leaves are 3-5 cm x 0.5-0.8 cm, lanceolate, thickened, stiff and spreading. The brushes are bright red, 10-12 cm x 2-4 cm, and produced in flushes throughout the year. The plants are easy to grow in a variety of soils and positions but are inclined to become straggly unless pruned regularly. Propagate from cuttings.

Callistemon 'All Saints'

A medium shrub to about 3 m tall, with weeping foliage and bright pink flower-spikes.

Callistemon 'Anzac' — see under *C. citrinus*

Callistemon citrinus 'Austraflora Firebrand' — see under *C. citrinus*

Callistemon 'Briar Hill'

Cultivar — 3-4 m x 3-4 m

Nov-Dec; also sporadic

Medium shrub, dense; branches pendulous, leaves lanceolate, new growth pink; flower-spikes to 12 cm x 6 cm, red to purple, profuse.

A most ornamental cultivar, suited to a wide range of climatic and soil conditions. Could probably suffer damage from heavy frosts. Withstands limited coastal exposure. Propagate from cuttings.

Callistemon 'Burgundy'

Cultivar — 2-4 m x 2-4 m

Nov-Feb; also sporadic

Medium shrub, much-branched; leaves about 5 cm x 1.5 cm, tapering both ends; flower-spikes to 10 cm x 6 cm, deep burgundy red, with gold anthers, terminal, solitary or in clusters. Aust. Pl. 10:25 for cultivar desc.

This decorative cultivar is a selected seedling from *C. 'Reeves Pink'*. It is one of the better cultivars and forms a dense shrub and withstands most climatic and variable soil conditions. Propagate from cuttings.

Callistemon 'Candy Pink' — see under *Callistemon* species. (Guyra)

Callistemon 'Captain Cook' — see under *C. viminalis*

Callistemon 'Chinchilla'

A medium shrub of 2-3 m x 2 m with graceful weeping branches. Pink flower-spikes are produced during Sept-Nov and March-May.

Callistemon 'Clearview Father Christmas' — see under *C. pallidus*

Callistemon 'Clearview Nora'

Cultivar — 0.5 m x 1-2 m

Dec-Feb

Dwarf shrub; leaves 5 cm x 0.5 cm, broadest near centre, narrowed at both ends, glabrous; flower-spikes about 5 cm x 5 cm, red.

This cultivar, which is not well known in cultivation, has as its parents *C. 'Harkness'* and *C. phoeniceus*. It adapts to a wide range of soil and climatic conditions, but prefers plenty of sun and moist soil for most of the year. Propagate from cuttings.

Callistemon 'Clearview Pink'

Cultivar — 3-5 m x 3-5 m

Nov-June

Upright to spreading, medium to tall shrub; leaves to 10 cm x 2 cm, prominent central and marginal veins, glabrous when mature; flower-spikes to 10 cm x 4 cm, pink.

Parents of this man-made cultivar were a pink flowered form of *C. paludosus*, and *C. pallidus*. It is not well known in cultivation but is very hardy to most conditions, and responds very well to summer and autumn watering, with a resultant long flowering period. Propagate from cuttings.

Callistemon 'Clearview Robin'

Cultivar — 3-5 m x 2-3 m

Nov-Jan; also sporadic

Medium to tall shrub; trunk prominent; branches upright; leaves to 12 cm x 1 cm, concave, ending in a fine point; flower-spikes to 15 cm x 6 cm, bright red, terminal, usually solitary.

Not well known in cultivation, this is an ornamental cultivar that grows best in medium to heavy moist soils. It prefers partial or full sun, and appreciates watering in summer and autumn. The parents are probably *C. salignus* and *C. viminalis*. Propagate from cuttings.

Callistemon 'Clusters' — see under *C. citrinus*

Callistemon 'Crimson Spokes' — see *C. rigidus*

Callistemon 'Dawson River' — see under *C. viminalis*

Callistemon 'Eastland'

Cultivar — 2-4 m x 1.5-3 m

Nov-Dec; also sporadic

Medium shrub; branches more or less erect; leaves 4-8 cm x 0.5-1 cm, lanceolate, sometimes falcate, mucronate, initially hairy, becoming glabrous, venation visible on undersurface; flower-spikes to 10 cm x 6 cm, mauve, flowers in an open arrangement; capsules about 0.7 cm diameter, apertures restricted, usually retain calyx lobes until near maturity.

An excellent cultivar that has proved hardy under varying soil and climatic conditions. The mauve flower-heads do not fade quickly. Propagate from cuttings.

Callistemon 'Endeavour' — see *C. citrinus* 'Splendens'

Callistemon 'Eureka'

Cultivar — 2-3.5 m x 2-3 m

Aug-Oct

A garden hybrid probably involving *C. shiressii* and *C. salignus*. The plants are narrow, erect and dense and bear masses of long slender bright pink brushes (4-6 cm x 4-5 cm). It is claimed that flowering proceeds throughout the year but it seems to be confined to a very profuse show in spring. The new growth is an attractive purplish-red. This plant is striking when in flower and well suited to garden conditions. It is becoming very popular in Qld. For many years it was known as Ward's hybrid. Propagate from cuttings which may be slow and difficult to strike.

Callistemon 'Ewan Road' — see *Callistemon* sp. (Blackdown Tableland)

Callistemon 'Gawler Hybrid' — see *C. 'Harkness'*

Callistemon 'Hannah Ray' — see under *C. viminalis*

Callistemon 'Harkness'

Cultivar — 3-6 m x 2-6 m

Sept-Feb; also sporadic

A much-branched medium to tall shrub; branchlets can be slightly pendulous; leaves to 18 cm x 1.5 cm, usually concave, new growth pinkish soft and silky; flower-spikes to 15 cm x 6 cm, terminal, solitary or in clusters, bright red. Aust. Plants 10:23 for cult. desc. and 3:349 for photo.

A very popular cultivar that originated in a garden in South Australia. It seems to have *C. viminalis* as one of the parents and possibly *C. citrinus* as the other. It adapts to a wide range of climatic and soil conditions, growing well in alkaline soils. Suitable for gardens as an ornamental or screening shrub, or for windbreaks or roadsides. It is often available as *C. 'Gawler Hybrid'* and *C. 'Harkness Hybrid'*. The cultivar does not readily set seed, which is seen as an advantage by people who do not find the seed capsules attractive. Propagate from cuttings.

Callistemon 'Kings Park Special'

Cultivar — 3-4 m x 3-4 m

Dec-Jan; also sporadic

Medium shrub; leaves to 8 cm x 1 cm, lanceolate, glabrous when mature, ending in small point; flower-spikes about 10 cm x 6 cm, bright red, usually in terminal clusters.

A recent introduction from Western Australia, where it appeared in Kings Park as a hybrid, probably involving *C. citrinus* and *C. viminalis* as parents. It is proving very adaptable, and withstands a wide range of soil and climatic conditions. Appreciates summer watering. Propagate from cuttings.

Callistemon 'Kotara Golden Fire'

This dense, medium shrub has weeping foliage with bright red new growth. The fiery red flower-spikes literally cover the foliage during Oct-Dec.

Callistemon 'Kotara Fire'

This is a medium, compact shrub of about 3 m high. It has bright red new growth, and fiery red flower-spikes can cover the plant.

***Callistemon* 'Kotara Rose'**

A compact plant with a height of about 3 m. New growth is bright red, and the flower-spikes are deep rose-pink.

***Callistemon* 'Ku-ring-gai'** — see under *C. viminalis*

***Callistemon* 'Lana'** — see under *C. citrinus*

***Callistemon* 'Lavender Showers'**

A shrub of about 2 m tall, with lavender-mauve flower spikes.

***Callistemon* 'Lilacinus'** — see under *C. citrinus*

***Callistemon* 'Lustre Creek'** — see under *C. viminalis*

***Callistemon* 'McGaskillii'** — see under *C. viminalis*

***Callistemon* 'Mauve Mist'**

Cultivar — 2-4 m x 2-4 m

Nov-Jan; also sporadic

Medium shrub, much-branched; leaves to 6 cm x 1.5 cm, tapering both ends, prominent oil glands, young growth very silky; flower-spikes to 10 cm x 6 cm, usually in dense terminal clusters, profuse; stamens mauve, fading with age; anthers gold; capsules about 0.7 cm diameter, slightly restricted aperture, usually retain spent calyx for extended periods.

An outstanding mauve-flowered cultivar. It is a selected seedling from *C. 'Reeves Pink'*, and is similar in colour, but with a definite mauve tinge in the flowers. Appears to be more vigorous than *C. 'Reeves Pink'*, and also *C. 'Burgundy'* which has similar origin. An ideal screening shrub. Withstands most soil and climatic conditions. Aust. Pl. 10:23 for desc. and photograph.

***Callistemon* 'Pindi Pindi'** — see under *C. viminalis*

***Callistemon* 'Prolific'** — see under *C. viminalis*

***Callistemon* 'Purple Splendour'**

This shrub grows to around 2 m in height, and provides an excellent display of deep mauve flower-spikes.

***Callistemon* 'Purpurea'** — see *Callistemon* sp. 'Mt. Drummer'

***Callistemon* 'Rainbow Falls'**

Masses of small red flower-spikes are produced by this cultivar, which grows to around 2 m x 1 m. Is reported as growing well in moist soils.

***Callistemon* 'Red Clusters'**

Cultivar 2-3 m x 2-3 m

Nov-Jan; also sporadic

Similar to *C. 'Pink Clusters'* but differs with its terminal clusters of red brushes which are about 7 cm x 4 cm in size. Is thought to be a seedling from either *C. 'Red Clusters'* or *C. 'Violet Clusters'*.

***Callistemon* 'Reeves Pink'**

Cultivar — 2-4 m x 2-4 m

Nov-Feb, and usually March-April

Medium shrub, much branched; leaves to 5 cm x 1.5 cm, tapering to both ends, prominent oil glands; flower-spikes to 10 cm x 6 cm, solitary or in clusters, terminal, profuse; stamens pink, usually fade with age; anthers gold; capsules about 0.8 cm diameter, squat, aperture not restricted.

This excellent introduction was first noticed in flower amongst a batch of *Callistemon* plants in a nursery at Cheltenham, south-east of Melbourne, in 1957-58. Its parentage is not certain, however there are strong affinities to *C. citrinus* in leaf and flower. It grows in most soils and climatic conditions. Responds well to pruning, and forms a densely foliaged shrub, useful as an ornamental or low screen. Propagate from cuttings. Photograph on cover.

The cultivars *C. 'Burgundy'*, *C. 'Mauve Mist'* and *C. 'Starlight'* were originally selected from seedlings of *C. 'Reeves Pink'*. These four cultivars all have similar foliage, and are very attractive when planted together or in selected combinations. Aust. Pl. 10:24 for full cultivar description.

***Callistemon* 'Rose Opal'** — see under *C. viminalis*

***Callistemon* 'Running River'** — see under *C. viminalis*

***Callistemon* 'Starlight'**

Cultivar — 2-4 m x 2-4 m

Nov-Jan; also sporadic

Medium shrub; leaves to 5 cm x 1.5 cm, lanceolate, glabrous when mature, ending in short slightly pungent point; flower-spikes to 10 cm x 6 cm, white, terminal, usually solitary.

This is stated to be a seedling of *C. 'Reeves Pink'*. It will grow in a wide range of soil and climatic conditions. Appreciates summer watering

and pruning after flowering. Useful for mingling with other dark flowered bottlebrushes. Propagate from cuttings.

***Callistemon* 'Violaceus'**

Cultivar — 3-5 m x 3-4 m

Oct-Dec; also sporadic

Much-branched medium to tall shrub; leaves to 6 cm x 1.25 cm, tapering both ends, many prominent oil glands, glands give impression of serrations on margin; flower-spikes to 12 cm x 7 cm, reddish-purple with gold anthers, terminal, solitary or in clusters, profuse.

A most decorative cultivar that tolerates a wide range of soil and climatic conditions. It usually grows as an upright, densely foliated shrub. It has affinities to *C. citrinus* in foliage, and to *C. pallidus* in flowering time and foliage, especially with its silky new growth. Propagate from cuttings.

Another cultivar sold as *C. 'Violaceus'* has obvious affinities with *C. macropunctatus*, and for more information see that species.

***Callistemon* 'Violet Clusters'**

Cultivar 2-3 m x 2-3 m

Nov-Jan; also sporadic

Similar to *C. 'Pink Clusters'* but differs with its terminal clusters of deep violet flower-spikes. Stated to be a seedling of *C. 'Reeves Pink'*.

***Callistemon* 'Western Glory'**

Cultivar — 2-4 m x 2-3 m

Oct-Dec; also sporadic

Medium shrub, upright, branched; leaves 4-7 cm x about 1 cm, lanceolate, ending in small sharp point, leathery, prominent central and marginal nerves, young growth covered in long hairs, glabrous when mature; flower-spikes to 12 cm x 5 cm, mauve-red, terminal, often in clusters, flowers densely arranged.

A recent introduction from Western Australia. This cultivar has close affinities to *C. citrinus*. There are similar forms of *C. citrinus* in cultivation which could result in confusion in identification. It is ornamental in flower, and will grow in most situations, with partial or full sun recommended. Propagate from cuttings.

Callistemon* 'Wild River' — see under *C. viminalis

***Callistemon* 'Wollumbin' — see under *C. viminalis* A.P. 10:24, cult. desc.**

***Callistemon* hybrid (*polandii* x '*Tinaroo*)'**

Qld — 2-4 m x 2-3 m

Aug-Oct

An upright shrub which is apparently a natural hybrid. It has short leaves and bears dense bright red brushes which have conspicuous golden stamens. These are borne in profusion and the plants are spectacular when in flower. It has proved to be hardy in cultivation and is well suited to tropical and subtropical regions. Propagate from cuttings.

***Callistemon* hybrid**

Cultivar — 2-4 m x 2-4 m

Nov-Jan; also sporadic

Medium shrub; branches pendulous, often to ground level; leaves lanceolate, glabrous when mature, ending in short pungent point; flower-spikes 10-15 cm x 6 cm, bright red, terminal, usually solitary.

Very showy, and adaptable to most soil and climatic conditions. Because of its growth habit it is ideally suited to planting near pools or waterways. Propagate from cuttings.

This callistemon has been sold as *C. species* 'Pendulous' and *C. citrinus* 'Weeping Form' but it has very few affinities to that species. It is more closely allied to *C. rigidus*.

***Callistemon* hybrid**

Cultivar — 3-5 m x 2-4 m

Sept-Nov; also sporadic

Medium to tall shrub; branchlets slender, many, new growth pinkish; leaves to 10 cm x 0.6 cm, lanceolate, slightly falcate, ending in fine slightly pungent point, light green, dense; flower-spikes to 10 cm x 2 cm, light pink, flowers in open arrangement, spikes often in clusters at ends of branchlets; capsules about 0.5 cm x 0.5 cm, not contracted at opening, scaly becoming glabrous.

An excellent bushy callistemon that can flower for many months. Will grow in most soils and does best in partial or full sun. Appreciates moisture. An ideal plant for windbreaks, screening, or informal hedges. Responds well to pruning. Propagate from cuttings, which can be slow to form roots. Some difficulty has been experienced in keeping cuttings alive during propagation.

This cultivar has originated in Victoria, but to date has not been officially named. It is probable that *C. paludosus* and/or *C. salignus* were involved as the parents.

Callistemon hybrid

Cultivar — 1-1.5 m x 1-1.5 m

Oct-Nov

Small shrub; leaves about 5 cm x 1 cm; flower-spikes to 10 cm x 5 cm, reddish fading to pink.

Parents of this man-made cultivar are stated to be *C. 'Harkness'* and *C. paludosus*. It is not widely grown, but a plant is recorded as being 9 years old and still retaining the dwarf growth habit. Tolerates light to medium frosts. Propagate from cuttings. ■

Callistemon And The Plant Family Myrtaceae

Notes by W. H. Payne

The group of plants known as *Callistemon* belong to a sub family group in the large plant family Myrtaceae. Much has already been recorded about this group of plants in previous issues and readers are referred especially to Issues 69, 70, 77 and 85.

Callistemon Study Group and Study Project

A study group exists under the leadership of Mrs. D. Phelps, 17 Fourth Street, Loxton North, S.A., 5333 and readers are referred to Issue 77, page 26 for details of how we can help you or how you can help us.

Callistemon Pests Control

The control of pests on *Callistemon* is dealt with in Issue 85, page 27.

Calothamnus — We Need Your Help

Very closely related and often called One-sided-bottlebrush, the species of *Calothamnus* are described in Issue 85. I need reports by readers on experience with cultivation, colour slides and offers by readers to grow species and report results. An excellent genus for beginners, who will help-help me? — Editor.

Beaufortia, Eremaea, Regelia and Phymatocarpus Study Group

Brian Walters, Lot 32, Wilchard Road, Castlereagh, N.S.W., 2750, is leader of a study group on this group of species very closely related to *Callistemon*. He is anxious to hear from anyone who can help or wants help in the cultivation of these beautiful small shrubs. He has the following to say: ■

Pre-germination Of Seed

Notes from Brian Walters

Up until this year I used the egg carton method for pre-germination of seedlings. However, I haven't been all that happy with it as the cartons tend to deteriorate and fungus problems seem to develop.

This year I switched to using margarine containers with a moist paper towel in the bottom. The containers are placed in a warm position, the lid being tightly fitted. This worked quite well but some seedlings quickly became rooted in the paper and were damaged on being removed. I now use chopped, moist sphagnum moss in place of the towel.



Beaufortia squarrosa

Photography by F. W. Humphreys

A many-stemmed, not much branched, upright open shrub to one metre high, the flowers are in clusters to 3 cm wide and long, a bright orange-red to red in colour. All species of *Beaufortia* are outstanding ornamental shrubs. Belonging to the same family as *Callistemon*, they should be more widely grown. Why not enquire from the *Beaufortia* Study Group leader?

After germination, seedlings are placed into individual 35 mm tubes and put into a capillary bed. At this stage I use a potting mix of straight coarse sand. The pots and mix are previously soaked in a mixture of Terrazole fungicide plus Maxicrop before being placed in the capillary bed. Seedlings are potted up into 65 mm tubes containing sand plus peatmoss in 4:1 ratio plus a bit of blood and bone, when 50-75 mm high.

Editor's Note: The above method is quite a useful variation especially for small seed or large quantities of seed. See article in page 231. As Study Group leader of the *Beaufortia* Study Group, Brian is dealing with small seed in larger quantities and I requested the above comment. I used *Beaufortia* seed in my egg cartons and found them difficult to handle. I also found them difficult to grow on, but I can see his fungicide/fertiliser solution would give the seedlings a boost.

- L. A. S. Johnson and D. F. Blaxell, New Taxa and Combinations in *Eucalyptus* — 4.
J. A. Armstrong and Jocelyn M. Powell, *Neobyrsesia* (Rutaceae): a new Genus.
G. W. Carr (Botany Department, La Trobe University, Victoria), *Baeckea ramosissima* A.
Cunn. (Myrtaceae). A taxonomic and ecological study.
Betsy R. Jackes (Department of Botany, James Cook University of North Queensland)
and Jocelyn M. Powell, Additions to the Genus *Acrotriche* R. Br. (Epacridaceae).
Mary D. Tindale, Notes on Australian Taxa of *Acacia*, No. 6.
S. W. L. Jacobs and A. Williams, Notes on the Genus *Zostera* s. lat in New South Wales
K. L. Wilsch, Notes on some Australian species of Cyperaceae.

Eucalyptus

A new, very distinct species, *Eucalyptus olsenii*, is described for which a new Series *Olsenianae* has been erected within the subgenus *Monocalyptus*. Although it has close affinities to Series MAH *Capitellatae* (stringy barks) on the basis of seedling hair type, it differs in being essentially smooth barked throughout, showing no indication of "stringy" bark. In fruit shape it resembles members of MAK *obliquae*. This distinct species is known only from a few localities in the S. Tablelands of New South Wales and is named for Ian Olsen, the well-known Sydney bushwalker, who discovered it.

Neobyrsesia

A new genus, *Neobyrsesia*, is recognised in the family Rutaceae. Allied to genera in the sub-tribe *Boroniinae*, *Neobyrsesia* is distinguished from the other genera by the following combination of characters. Leaves simple and opposite; flowers 4-merous with persistent petals; stamens equal in number to the petals situated in front of the sepals and persistent; intrastaminal disc continuous and unlobed; carpels each with two collateral ovules; and explosive capsular fruits. This monotypic genus is endemic to the E. Alligator River area of the Northern Territory.

The only species, *Neobyrsesia suberosa*, is a weak-stemmed shrub to 30 cms high with simple, strongly discolorous leaves and mucronate at the tip. The flowers are inconspicuous, white and borne on an inflorescence shorter than the leaves.

Baeckea

The variability shown by *Baeckea ramosissima* in south-eastern Australia has led to the recognition of two subspecies.

Key to the subspecies

1. Flowers erect, corolla (5-)7-10(-15) mm diam., petals white to brilliant pink or mauve-purple. Floral trichomes 2-15, always present. Stamens 10 or rarely fewer subsp. *ramosissima* a.
- 1.* Flowers nodding, corolla 3-5 mm diam., petals white + tinged with red above or below. Floral trichomes few or absent. Stamens (3-)5-10 subsp. *prostrata* b.

B. ramosissima ssp. *ramosissima* is widely distributed in coastal and inland localities from northern New South Wales through Victoria to South Australia and Tasmania.

B. ramosissima ssp. *prostrata* occurs in southern coastal New South Wales, southern Victoria and northern and western Tasmania.

The geographical variation, ecology and biology of the two subspecies are discussed.

Acrotriche

A new species, *Acrotriche plurilocularis* is described from the south-west of Western Australia. It closely resembles the narrow-leaved form of *A. cordata* but can be distinguished from the latter by the narrower leaves and less prominent venation, the presence of small papillae between the veins, and in being single-stemmed.

The species formerly known as *Monotoca baileyana*, from north-east Queensland, is now recognised as *Acrotriche baileyana*.

A key to the species of *Acrotriche* is provided, accommodating *A. plurilocularis* and *A. baileyana*.

New locality records are given for *A. aggregata* and *A. patula*.

At last the first of a series of 40 volumes to record the entire flora of Australia. The first volume available contains the introductory material and is an invaluable reference to the floristic regions of Australia. Available from the Editor, Australian Plants \$12.50 (hard cover issue) plus \$1.50 post.

Zostera

Three species of eel grass are recognised as occurring along the New South Wales coast and their distribution is outlined.

Z. capricorni is found below high tide in estuaries and bays all along the New South Wales coast and into Queensland and Victoria.

Z. muelleri is common on the south coast of New South Wales extending at least as far north as Sussex Inlet. Unlike *Z. capricorni*, it prefers inlets and estuaries with restricted access to the sea, and consequently it is uncommon to find the two species growing together.

Heterozostera tasmanica is found along the southern coastline of Australia with only one known living occurrence in New South Wales at Jervis Bay on the south coast.

Anatomical comparisons between the rhizome and the leaf and stem of these three species is made to aid the identification of specimens which is frequently difficult, particularly with incomplete specimens.

Cyperaceae

Four new species are described. *Baumea johnsonii* is confined to the central coast ranges and central tablelands of New South Wales. It is closely related to *B. gunnii*, *B. muelleri* and *B. nuda* but differs in having scabrous leaves and culms. A key is provided to distinguish these species of *Baumea*.

1. Leaves flattened, 1.5-2.5 mm wide.
2. Leaves and culms scabrous. Leaf sheaths reddish. Nut 2.5-3.5 mm long, shortly stipitate *B. johnsonii*
- 2.* Leaves and culms not scabrous, leaf sheaths stramineous. Nut 3.0-3.5 mm long, with elongate stipe *B. muelleri*
- 1.* Leaves reduced to sheaths or terete (0.5-1.5 mm diam.).
3. Leaves long, terete or $\pm$ bisulcate, c. 0.5 mm diam. Nut c. 2 mm long, with elongate stipe *B. nuda*
- 3.* Leaves reduced to sheaths or long terete and then c. 1.5 mm diam. Nut 2.5-3.5 mm long. Stout plants with leaves (when developed) as long as the inflorescence *B. gunnii*

Bulbostylis burbridgeae is a very distinct species with squarrose spikelets and more or less oblong glumes, unlike any other known Australian or Malesian species. It is found in the Fortescue District of Western Australia.

Cyperus portae-tartari is found on the sandstone ridges at the northern end of the Queensland-Northern Territory border and in Arnhem Land.

Cyperus viscidulus is known from the Northern Territory and the Kimberley region of Western Australia. It is most closely related to *Cyperus ixiocarpus* but differs in having shorter spikelets with the glumes more closely packed on the rachilla. The glumes are also smaller and lack a prominent mucro.

Two new combinations are published. The little-collected species formerly known as *Baumea australia* becomes *Gahnia australis*, whereas *Gahnia polyphylla* is recognised as being synonymous with *Schoenus drummondii* and consequently must now be known as *Gahnia drummondii*. A revised key is provided to the species of *Gahnia* section *Microstachyae*, to which both *G. australis* and *G. drummondii* belong.

Cyperus lhotskyanus is reinstated after the study of the Type specimen showed it to be identical to the species hitherto known as *C. rutilans*, and *Lepidosperma exsul* is relegated to synonymy under *Tricostularia neesii*.

Cyperus compactus, widespread in S.E. Asia, is recorded for the first time in Australia. Collections have been made from Ingham in Queensland and from the Northern Territory. A key is provided to the Australian species of *Bulbostylis* and *B. eustachii* is synonymised under *B. barbata*.



Acacia cheelii

A shrub to small tree typical of the species with flowers in long spikes 4-5 cm long and "leaves" somewhat leathery 10-17 cm x 12-25 mm with five parallel veins. The botanists assure us that these "leaves" are in fact small branchlets, flattened and often broad to resemble leaves.

Acacia

Six new species of *Acacia* from eastern Australia are described.

Acacia constablei occurs on the south coast of New South Wales near Narrabarba, where it forms dense whipstick-like scrubs. It is closely allied to *A. mearnsii* but the latter species is an erect, spreading tree to 15 m and flowers in early summer, whereas *A. constablei* flowers from June to August.

Acacia covenyi is a shrub or tree 1.5-7.5 m high with bluish foliage and bright yellow flowers in racemes at least as long as the phyllodes. It occurs in the Bendethera district and east of Kybean in the Southern Tablelands. It is allied to *A. barringtonensis*.

Acacia kydrensis is a shrub 1 m high with smooth grey bark and phyllodes with red margins. The only collections of this species have been from the Kydra Reefs district of the Southern Tablelands in New South Wales.

Acacia floydii is an erect phyllodinous shrub or small tree. It closely resembles *A. betchei* but differs in having cream-coloured flowers and fewer flowers in each head. *A. floydii* occurs on the granite plateau east of Ten-Tenfield.

Acacia costiniana is found in the Tinderry Mountains of the Southern Tablelands. A close relative of *A. lucasii*, it differs in the pendulous habit of the branches, the phyllodes being markedly asymmetrical at the base and sparsely clothed on both surfaces with short, white appressed hairs. Both species are characterised by straight-sided, dark red-brown legumes which have a dense, villous vestiture unlike any other species from New South Wales.

Acacia georgensis is a shrub or tree 3-10 m high found on Dr. George Mountain near Bega. It is closely allied to *A. cheelii* but can be distinguished by the corrugated bark towards the base of the trunk, the pale yellow inflorescences and the scurfy legumes without white hairs towards the base.

Even today, the Sturt's Desert Pea is regarded as difficult and relatively few people attempt to grow it. Yet given a well drained bed in a sunny and partially protected position, it gives few problems and is undoubtedly a most rewarding subject. Probably the most comprehensive account of the cultivation requirements of the Desert Pea was given by Frank Bridgeman in an article in *Australian Plants* of September 1962 in which he described his experiences of 19 years of growing the plant; what he said then is still relevant today. He placed particular emphasis on the soil which should "be deep without a sticky clay subsoil", drainage and a sunny locality; the texture of the soil is less important than its depth and it should be neutral. He also believed that for healthy plants, it was necessary to ensure that nitrogen fixing (*Rhizobium*) bacteria were present.

In our experience, raised garden beds are quite satisfactory and there is no need to adopt extreme measures such as growing in upturned pipes, drums, etc. A layer of crushed scoria (or clean gravel or coarse sand) is very useful as a mulch, both up against the rootstock and for some distance around it. This helps to minimise rain splash and reduces the possibility of fungal attack by collar rot, a problem which the stems can suffer when in contact with damp soil for extended periods.

For germination, the seeds can be nicked if required and soaked in water until roots develop (generally about 2 days). However, it appears that a lot of commercial seed is already permeable and requires only a soak in warm water to germinate. The pre-germinated seeds are best sown in situ (though bait very well for snails and slugs). Seedlings can be transplanted when small though care is needed and it is better to grow them in a deep container. A plant 1 cm high can have 5-10 cms of roots which should not be disturbed in planting. Once established, the plants will come away very quickly, and we have measured growth rates of 2 cm/day at the tips of trails of healthy specimens. Plants grown from seeds in September-October in Southern Victoria will flower in January-February and continue until about May when they usually die. They rarely survive a winter and even then seldom flower in their second year. However, as they are so easy to grow, they are best treated as annuals. More recently, there has been considerable interest in grafting the Desert Pea, as described on page 228. ■

CULTIVATION REPORTS FROM OTHER READERS

To supplement reports in previous issues of *Australian Plants*, especially Vol. 1, Issue 12 and Vol. 6:279, readers have sent the following reports —

Sturt's Desert Pea at Rupertswood, Sydney, N.S.W. by P. C. Brady

I have had success growing this plant from cuttings, using both powder and solutions of hormones. I place the cuttings (which may be "half-hardened" or almost mature) under a bell jar, with no mist, for a week or so; taking the jar off at night—then I place them out under glass for the rest of the period and mist occasionally. Usually 90% strike occurs after 3 weeks in late summer. These cuttings then grow happily through winter (in the glasshouse or frame) giving early flowering pot plants.

In order to keep them alive outdoors in pots I use a very rapidly draining mixture of perlite, orchid compost (large bark pieces, charcoal and some peat) coarse river sand with small gravel, and about ¼ coarse shell grit. With this mixture in 30 cm pots, the plants stay alive for a long period and flower well. I water every day or so depending on weather and place the pots in the glasshouse when rainy humid weather occurs. This treatment usually prevents root rot—at least for most of summer enabling me to retain plants over winter. Any plants which succumb in late summer are used for cuttings.

All attempts to grow the plants in the soil—even in built-up concrete rubble beds—results in death of the plant at or after flowering.

Sturt's Desert Pea at Campbelltown, S.A.

by Ron Hayward

My soil is mostly deep and dark as is common in the Torrens Valley. For *Clianthus formosus* I selected a spot where some river sand had been tipped years ago and where there were plenty of stones.

I always find germination very easy. I give each seed a slight nick with the point of a very sharp pocket knife. Then I drop them in a cup of cold water till they sprout. Most do in 24 hours.

Last year I used commercial seed and did not plant till October as I was away in early spring. Contrary to the writings of some, I find I must keep the seedlings very moist till they get a hold. In my garden even mature plants need water at least once a week through the summer. My guess is that the roots do not spread in the heavier soil as they do when growing in the interior.

This season I had a wonderful display of flowers from January till May with a flower or two persisting till the end of May.

Cold, wet conditions and frost kill the plants in Adelaide's winter. This year I have one small plant still alive. It was planted in December and showed extremely slow growth.

I believe commercial seed often comes from the Port Hedland district of W.A. where frosts and cold wet conditions do not persist. In the north of South Australia seed germinates naturally in the autumn or early winter and plants flower in early spring, indicating that they stand severe frosts. Next year I intend trying seed from such areas to see if plants will withstand Adelaide winters.

I would be interested to know of others who have experimented with seed from areas of severe frost.

Sturt's Desert Pea at Scott's Head, N.S.W.

by Paul Hicks

We bought the seed in W.A. in October, at 50 cents a packet, and sowed it in a loam, sand, vermiculite mixture (very unscientific, no measured quantities) in about 3 pots which we kept in polythene bags on a south-facing porch. Eventually some germinated in each pot and I planted out one pot with about 3-4 seedlings in a dreadful bit of dry, barren soil where nothing previously would grow.

The seedlings were watered generously and went like a bomb. By February there were hundreds of flowers and my neighbour was so proud of it, he might have raised them himself. We were hoping for a good lot of seed as pods were forming but following a couple of days of very heavy rain the whole mass of foliage and flowers just collapsed and died.

The other seedlings were planted in equally unpromising soil without disturbance but they just died.

Beginner's or fool's luck maybe but gee they were a glorious show and we were very proud of them.

Sturt's Desert Pea in Armidale, N.S.W.

by H. L. Bell

Here at Armidale we may expect the hose to be frozen solid for at least a quarter of the year, so most people assume that *Clianthus formosus* is unsuitable for our climate.

The main problem is that seedlings are difficult to transplant, so if you want the species out in the open, where it flowers best, the plant has to be outside for at least one winter. The alternatives are to grow in pots, or against a wall. I have also tried growing seedlings in 'jiffy' pots and then planting out, complete in pot, in spring. The results have been poor, with little growth and no flowering.

Plants in pots have flowered well but mysteriously die suddenly. I had believed that over-watering was the problem but now think that overheating of the roots was the cause, as deaths are all in summer. Best results have been from seeds sown in an up-ended terra-cotta pipe, set against a west-facing wall. One plant commenced flowering in December and flowered non-

stop until the following October, the temperature at that spot reaching -7° on several occasions. Sometimes the plant would be covered in frost, but by the time the sun reached the spot (about 11 a.m.) the frost had melted. Seeds set by this plant were fertile.

This seems the key to survival in frost climates, for other species as well as *Clianthus*. Provided the sun can be kept off until the frost has melted, the ill effects can be minimized. Two of the Sturt's Peas out in the garden, although they failed to flower, were unharmed by frost, being shaded by large bushes until about 10 a.m.

Sturt's Desert Pea at Ouyen, Victoria 3490

by Jocelyn M. Lindner

We first grew *Clianthus formosus* when we started our garden in 1972 and have had healthy plants each year since, except for 1976.

Success in germination from 1972-1977 was achieved by pouring boiling water onto seed in a cup and leaving overnight. Three seeds were planted in a number of spots in the garden and covered lightly with soil (our soil is, at the best, a light sandy loam and would be alkaline) and then covered with a light layer of lawn clippings. This is kept moist. Germination usually occurred in 3-4 days. The healthiest plant only was left in each spot. Except in 1972, the seeds were planted in late October or early November (in 1972 it was early January) and they flowered in early May. Our healthy plants grow to two metres across in an open situation.

In 1976 we only had one plant survive and this was stunted and miserable. We made the mistake that year of planting near other natives and have since realised that previously the odd small plants had been surviving near other trees or shrubs.

In 1978 and 79, germination was achieved by filling a two litre milk carton with our normal soil, putting the seed on top, covering with soil, pressing the whole down firmly, pouring on boiling water, and then giving a light covering of lawn clippings. When seeds germinated the bottom of the carton was cut out and the contents slid out into a permanent position. This is a good way of starting off plants for friends.

We find it best to protect plants during early stages, with a bag tree guard or open-ended 4 gallon drum. They are kept damp during this stage. Last year, when the rainfall was below average, the plants got a really good soaking every 2-3 weeks. We use bore water for garden purposes but this has a detrimental effect on some plants. One in four plants survive for two years but this depends on the severity of frosts.

Sturt's Desert Pea at Ocean Grove, Victoria

by Doug McKenzie

I have a number of Sturt's Desert Pea growing in large pots or hanging baskets, the oldest being two years old. I have found the most important factors in keeping these plants alive is to shelter them from rain in winter when the leaves and stems do not dry out quickly after rain, and to give them plenty of sun. Plants flowered this year (one of our wettest on record) right through the winter. The plants were hung or placed under an overhanging eave on the north side of our house where they had close to full sun, yet protection from drizzle and rain. Plants can be kept for a long time in the one pot by pruning back and regular fertilizing. The plant on page 197 is in a 60 cm basket lined with plastic with holes punched in the bottom for drainage. The potting mix is peat moss/sand/soil and is fertilized with half strength liquid fertilizer (Aquasol or Thrive) every 2 or 3 weeks from September to May.

Red spider can be a real problem on plants, particularly in late summer and autumn. This pest can rapidly build up in numbers and severely affect a plant's vigour so that flowering ceases and the plant stops growing. If a plant looks unhealthy, with green leaves mottled with yellow or cream spots, look for tiny dots on the undersurface. These red spiders and their eggs are easily controlled by spraying under the leaves with a miticide. I have found Kelthane to be an excellent control. ■

Grafted Desert Peas

by Doug McKenzie, Ocean Grove, Victoria

The advantage of grafting lies in providing a plant with a new root system; it does nothing to solve the problems to which the above ground part of a plant is prone. Many of the problems in growing Sturt's Desert Pea (*Clianthus formosus*) in the cooler and wetter parts of Australia are solved by grafting it onto *Clianthus puniceus*, the New Zealand Glory Pea. Grafted plants are still affected by such pests as snails, red spider and caterpillars and diseases such as botrytis (grey mould) or frost damage. Grafting does however, help in solving the problems which occur at or below ground level such as collar or root rot.

The root system of *C. puniceus* is that of a truly perennial plant. It is slow to develop but much longer lived, it adapts to seasonal variations in moisture content of the soil and it has considerable powers of rejuvenation and regrowth if damaged. On the other hand, the root system of *C. formosus* is much less tolerant of seasonal changes in soil moisture and resents any disturbance. It grows rapidly and under ideal conditions reaches maximum size in a matter of months, but dies soon after.

Grafted plants perform much better as container plants in colder climates. The root system is very adaptable with no problems at repotting time. It seems to tolerate moderately rich potting soils which can be kept reasonably moist, and does not mind being confined in a container. When the plant becomes leggy and sparse in foliage, it can be rejuvenated by cutting back the long trails to within 15 to 20 cm of the main stem, knocking away perhaps a half or more of the old soil and roots, and repotting it in fresh soil in the same, or preferably a smaller container. New fresh white roots soon fill the pot and the plant can be potted on when fresh trails have grown out from the callus area or from the old stems. This should be done when conditions for growth are good — not in the coldest winter months. I am not sure how many times this can be done, but I have one plant which is beginning its third 'revival' using this technique. It also solves the problem of repotting a huge plant which inevitably has several branches torn off when repotting. Plants which have been planted in the garden, and grown quite large have been pruned back, lifted with a small ball of roots, potted into a container of suitable size and grown on progressively in larger pots.

A potted plant can be moved according to season. At the height of summer, a grafted plant will tolerate full sun after it has reached perhaps 25 cm in height, but it will flower quite well in broken sun or in a position where it is in sun for just half the day. During the colder months it needs all the sun it can get, as well as protection from rain which may keep the foliage wet for long periods and lead to botrytis. I have found the ideal position in winter to be under the eaves on the north side of the house which also protects the plant from the cold winds from the south-west and affords protection from frost. Under these conditions flowering occurs off and on just about all year. See colour plate on page 197.

One plant grew outside last summer and autumn in a pot, was put in a glassed-in sun room during the winter (and flowered right through the coldest months), was hardened off in the spring and planted out in the garden where it is flowering now through summer and autumn.

Clianthus formosus — A grafted plant — Opposite

The initial graft started on 22.6.80 may be seen in the illustration in the lower left hand corner, in a pot and under a glass jar. Above this is the plant after 6 weeks and to the left, the plant 18 weeks from time of grafting. Growth is particularly rapid after 10-12 weeks and the plant may be seen flowering some months after. Plants may be allowed to grow prostrate as shown with the form with the black boss on the flower, or they may be supported upright as shown for the all red form in the top left.



The Grafting Technique:

Wedge Grafting at the Cotyledon Stage

This method has been described in detail in several books and papers. The main drawback however, is in its requiring an experienced, extremely dextrous person with excellent eyesight. After grafting over 700 plants using this method I have become quite deft in making good clean cuts and accurately positioning and tying the tiny stems of the 2 or 3 day old seedlings and can achieve a success rate of over 75%.

Seedlings of *Clianthus puniceus* should be quite young (10 to 20 days old) with long thin hypocotyls induced by 'drawing' the plants in half filled germination pots where they will grow long, straight and thin up to the light. This produces a seedling the stem of which is rather small in diameter to match the hypocotyl of the Sturt's Pea seedlings and also allows a graft to be done well clear of the soil surface. The *Clianthus formosus* seedlings, no more than 3 or 4 days old are cut leaving about 7 or 8 mm of hypocotyl below the cotyledons, trimmed with a new sterilised razor blade to a wedge and very accurately positioned in a similar split between the cotyledons of *C. puniceus*. After tying, taking great care not to crush the soft stem tissue, the tiny grafts are placed under mini glass houses of small glass or plastic tumblers, and placed in semi-shade in a glasshouse.

These covers are changed each morning after the overnight build up of moisture on the glass. After about 7 or 8 days the plastic tumbler is gradually raised off the plant for the following 7 days, then the young plant is kept in a shaded part of the glasshouse and gradually hardened off to full light for a further 3 to 4 weeks. After removing the tape, the plants are put outside and hardened off to outdoor conditions. Flowering occurs in 3 to 5 months from the time of grafting.

This method can be used at most times of the year, but the management of the young grafts is very difficult during the hottest and coldest months. The soil is sprayed several times with PREVICUR or DEXON before and after grafting to minimise damping off which can be a real problem when the plants are kept under high humidity.

Other Methods of Grafting

I have had success with several conventional methods of grafting on *Clianthus* species. The main key to success of detached scion methods of grafting (wedge grafts and whip and tongue grafts) appears to be the vigour of the scion. At all times when scions which consisted of short, mature stem sections with mature leaves and dormant buds were used, the graft failed. Successes have all been with actively growing side shoots or the terminal shoot of a young plant. Older stems tend to be pithy in the centre and although they may live for some time after grafting, the dormant buds never seem to develop. On unwrapping, the centre of the stem has collapsed.

When younger terminal shoots are used, the stem is firmer in the centre and actively lengthening. Probably the best scions are the terminal shoots of young seedling Sturt's Peas which have relatively long stem sections between leaf nodes and the leaves have relatively few leaflets.

I have used side shoots of 15-20 mm in length induced by pruning the end of the larger trails of more mature flowering plants. These however, usually are quite large in diameter and the unopened leaves tend to have a large number of leaflets which soon open out to quite a large leaf which presents problems in avoiding desiccation in the early stages before the graft becomes efficient. Nevertheless, this method enables the propagation of grafted plants from particular colour, size or form.

All grafts have been done as quickly as possible to avoid too much weeping or drying of cut surfaces. After grafting, the plants have been kept under fairly high humidity. (I have used glass tumblers or plastic bags — completely enclosed for about 10 days and gradually lifted over the following 10 days). Union seems to begin to take place in 2-3 weeks and I keep young grafted plants in a fairly humid position in my unheated glass-house under a bench for at least 2 to 3 weeks after the glass or plastic cover has been completely lifted. The plastic wrapping tape is removed about 4 to 5 weeks after grafting and plants are gradually hardened off. ■

WILDFLOWERS

FROM SEED

Part 4 by W. H. Payne

Previous parts in this series described how I successfully germinated the seed of 70 species of wildflowers. I decided to carry out a series of trials to confirm the advice given in previous issues over the years. While the experts may laugh at my crude methods I decided to keep to procedures that were simple and did not require special facilities such as glass houses, hot boxes, etc. As such trials are of little value if carried out on only a few packets of seed and an indiscriminate range of species, I confined the initial trial to species of the pea-flowered plant families, the principal subject of a number of issues of this volume. The objective is to encourage hundreds of readers to carry out similar trials throughout Australia and to study different practices in cultivation of the plants produced.

This is an exciting way to directly assist in the preservation of the Australian Flora and add to the beauty of your garden as well. Now is the time to gather or purchase seed for planting next April. What group of plants will you try? We can supply any advice you need.

So Where Are All The Plants?

Seventy packets of seed would produce over a thousand plants! Alas, I have to report failure. As there were in fact over a thousand plants and I did have success in their germination to tiny seedlings, I had to use a method that made the job as easy as possible. Each seed after pre-germination in the egg boxes was planted in a small plastic 3 cm pot. The 13 commercial propagation trays used and available commercially, each held 72 pots. As described a sheet metal tray was made to enable three trays to be capillary watered at a time and this meant rotating them with 10 trays out of water at a time. While I was away on holidays a storm came and wrecked the crude covers I had over the trays of pots and wind and sun dried out the seedlings — disaster.

The Second Try Was More Successful

I started all over again in June, 1981. However a number of valuable lessons were learned, these being:

1. Seed Preparation

The boiling water treatment of seed before placing in the egg cartons as described, was a success. Using cartons for three rows of eggs, I had three methods under trial:

- 1.1 Really boiling water was poured directly onto the seed in cups and the seed allowed to soak for a week.
- 1.2 Hot but not boiling water poured onto seed in a cup.
- 1.3 A quantity of seed has the outer coat cut with a sharp blade and then soaked in warm water in a cup.

While method 1.3 was successful on seed I did not damage too much by my clumsy attempts to cut the hard outer coat, it was a time consuming difficult task especially with the smaller seed and not worth the effort.

Method 1.2 was generally a failure with much lower germination than method 1.1 with really boiling water. Concern has been expressed that this will cook the seed. With my 1981 trial I used boiling water only with excellent results on practically all species. Those seed that rotted were more likely dead rather than boiled.

2. Pre-germination Of Seed

The egg carton method was most successful in both the 1980 and 1981 trials. It was of no value to record germination times as seed in the one batch, germinated in periods of a few days to three months. The larger seed seemed to germinate more quickly but the occurrences were not consistent enough to reach a conclusion. The egg boxes get a little limp after a few weeks but the seed is easily transferred to fresh boxes. There were odd occurrences of the growth of a fungus but this appeared to be associated with a rotted seed which was removed, or the good seed washed and transferred to a fresh carton. It is important to inspect the boxes every few days as should the new shoot from a germinating seed enter the egg

carton wall, it is usually damaged and lost trying to remove it. It is a fascinating way to grow seeds if they are large enough to handle. I used a small stick, wet on the end, to transfer my germinating seed to a pot.

To test the theory that the egg cartons were not necessary for pre-germination of seed, I used two methods in the 1981 trial, half the seed was placed into the cartons after removal from the cup of previously boiled water and the other half sown directly into pots of coarse sand. The results achieved by first pre-germinating in the egg cartons, very greatly exceeded those with direct sowing.

3. The 1980 Trials

The 1980 trials used five different materials in the 3 cm pots into which the pre-germinated seed was sown.

- 3.1 A fine sand generally available for concreting — poor results.
- 3.2 Pure perlite. Results were not good. I may have packed the perlite in too tightly as roots did not readily penetrate. This could be a possible medium for certain types of seed.
- 3.3 A mixture of 3.1 and 3.2 above — poor results.
- 3.4 A coarse sand I went to some trouble to collect — OK.
- 3.5 A washed river sand generally sold for concreting. After rewashing by thrusting a hose in a bucket of sand and letting the water spill over until it was clear I got a reasonably coarse sand that proved excellent. This was good news as it is readily available by the tonne and was used exclusively in the 1981 trial.

4. Watering Germinating Seed

Watering of young seedlings is critical. Capillary watering, i.e. letting the pots stand in a tray of water allowing the water to go upward by capillary action in the coarse sand, gives the best results. The small seedling is not knocked over by a jet of water when watering from above, the upper roots are not disturbed or washed out and the roots tend to grow down to the water. Some people go to some trouble to automatically maintain the water level by special trays with inverted bottles of water. These are excellent in some cases but for this application I found that with a large tray, I could reasonably maintain the water level by topping-up once a week or longer outside hot periods.

I made two more sheet metal trays that held four seed trays containing 72 pots in each. They were 15 cm deep allowing good clearance between a covering of glass on top (made of assorted sheets) and the pots sitting in the bottom. With the trays I already had, I was able to have 11 seed trays of 792 small pots permanently standing in 2 cm of water (not 20 cm as mentioned on page 137). My seed germination in the egg cartons was nearly 100% so more space was needed. I can get 25 — 3 cm pots into each large ice cream carton and ended up with 13 cartons full of pots, each in a plastic bag with the opening folded under such that the weight of the carton held it air tight. A piece of fencing wire humped up from corner to corner held the plastic up to shed off water.

I was able to have two weeks away in September and when I came back all the small seedlings looked well and demanding bigger pots. They had not been touched for the whole period.

Just a word of warning. I was successful with pots standing in water in a tray with glass over the top because I did it in Sydney in winter, June, July, August. Later in the year or in warmer climate, fungal attack in the form of damp-off would have meant failure. In September I covered the glass with a shade sheet. In October the glass is removed and a thick shade sheet is necessary. If you have the time the best way is to stand the pots in shallow water for one hour per day to water them and be sure they do not dry out between watering. You will have to find out what suits your circumstances, but with a little trouble you can develop a successful method.

The next section will be growing on these seedlings.

A Curious and Diverse Flora

A 60-minute film on the Australian vegetation, produced by the C.S.I.R.O. The film has been extremely well presented with a minimum of scientific names, in fact hardly any, but with a wealth of scientific information served in such a delightful and simple way that it is ideal for people of all ages. The photography is excellent, resisting a tendency to magnified still shots so often seen in the past, all scenes being presented in perspective and "alive". The dialogue is entertaining and extremely well informed and instructive. The 16mm film will cost \$750.00 or a 3/4 inch V-matic (PAL) video-cassette, \$280.00. This should be in all film reference libraries and widely shown.

Australian Wildflower Seed Suppliers

Nindethana Seed Service — Largest selection of native seed in Australia. Nindethana, Narrikup, W.A. 6326. Available in 50c pks. gram lots or kgs. Send 24c stamp for free catalogue.

H. Grant — 2 Sandra Pl., Dubbo, 2830. West N.S.W. a speciality. Two stamps for a catalogue posted.

Wildflower Nurseries in New South Wales

Bundara Native Nursery — 37 Carters Road, Dural, Sydney, 2158. Tel. 651-1962. Specialising in *Grevillea*. Open weekends. Weekdays please ring first.

Cranebrook Native Nursery — R23 Cranebrook Road, Cranebrook, N.S.W. Tel. (047) 77-4256. Four miles north of Penrith, between Tadmore and Taylor Roads. Open 10.00 a.m.-6 p.m. Closed Sundays.

Denovans Nursery — 188 Marco Ave., Panania, 2213. Tel. 77-8891.

Forest Native Nursery — 9 Namba Road, Duffy's Forest. Tel. (02) 450-1785. We specialise in a wide range of native plants. Catalogue \$4.50 posted. Open 7 days.

Floralands — Parry's Nurseries Pty. Ltd. Kariong via Gosford, 2250. Tel. (043) 40-1142. Preservation by cultivation. Send. \$1.50 for descriptive catalogue.

Kentlyn Native Plant — 96c George's River Rd., Campbelltown, 2560. Tel. (046) 25-1583. Open 7 days.

Sylvan Nursery — Portsmouth Road, Erina. Large range. Open weekends. Mon.-Fri. Please ring first (043) 67-7417.

Wirrimbirra Native Nursery — Hume Hwy. between Bargo and Tahmoor E. side 2574 (3 km N from Freeway entry). Wide range including unusual plants. Tel. (046) 84-1112.

Wirreanda Nursery — end of Wirreanda Rd., Ingleside, 2101. Tel. (02) 450-1400. Over 20,000 advanced and semi-advanced native trees, shrubs, ferns and indoor plants. Public and trade welcome. Open 7 days. Send S.A.E. for list.

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Belbra Nursery — Box 12, Halls Gap, 3881. In the heart of the Grampians. Large range of Australian natives. Closed Wednesday only.

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BOOKS ON WILDFLOWERS

This is a mail order service of books, the price including a discount of 10% plus postage. You may be able to buy the following books a little cheaper and some groups in the society are offering certain books at a bigger discount so if you want to shop around after reading my reviews, then do so. However the service we offer will be convenient and any small profit made is reinvested in the production of Australian Plants. You may pay a little more through this service but the donation will be well used.

Solanum in Australia by D. E. Symon

This revision of the Genus *Solanum* in Australia is available from The Director, Adelaide Botanic Gardens, North Terrace, Adelaide, S.A. 5000, for \$18.00 plus \$2.00 postage. A very well presented book of 368 pages (25 x 18 cm.), it describes the 125 species with simple keys for identification and with illustration by 133 line drawings. *Solanum* is in the potato family, but many Australian species are grown for their flowers, usually blue to purple and to 6 cm. across. An invaluable reference for botanists and students and all those seriously interested in the Australian Flora.

Acacias Of Australia by Marion Simmons

\$32 plus \$2.00 post

The bulk of this 326-page (26 x 18 cm.) book comprises an accurate sketch of each of 150 species of *Acacia* on the right hand pages, with full page descriptions of the species illustrated opposite giving distribution, habit, foliage, flowers, pods, seed, identification and a section of interesting comments. These are supported by 54 excellent colour plates by John Simmons presented to give a good guide to the actual plant and its features. A further feature is a section by Les Pedley on the classification of *Acacia*.

Australian Plants for the Atherton Tableland

Produced by the Tableland Branch of the Society, this small 30-page book is a credit to those concerned. Some 300 species including 95 trees, 105 shrubs and 35 rockery and ground plants as well as climbing plants, ferns and palms, are described together with their natural distribution and hints for propagation and cultivation under tablelands conditions. It is groups such as this who are collecting information on plants that will grow in their area, or how to succeed with cultivation in their area, that are the backbone of the Society.

Based on further years' experience, a more ambitious colour illustrated book appears inevitable for this area. Available for \$2.00 plus 25c postage from S.G.A.P. — Tableland Group, 14 Herberton Road, Atherton 4883.

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"Native Plants Of Queensland" by Keith Williams	\$32.00
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"Flora of South Australia", Black — Part 1,	\$20.00. Parts 2-3 and 4 each	\$9.00
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"North Australian Plants," Harmer	\$8.00
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VOLUME No. 3. Issues 21-28, bound with "Catalogue of Cultivated Australian Plants".

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PUBLISHING SECTION FOR SOCIETY—Produced as a non-profit venture.

Managing Editor: W. H. Payne, assisted by P. D. Leak, B. Kennedy and B. Burnham. Do not telephone or call at private home. Enquiries by mail only.

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A substantial increase in price is necessary for us to survive. Your continued support will be appreciated.

SAVE OUR FLORA FROM EXTINCTION



Teloepa mongaensis — Playing Host to a Noisy Friar Bird

"Foliage Birds", a book by George Adams, available from the Editor for \$35.00, displays this scene on a large 33 x 23 cm colour plate. This large page size book of 112 pages illustrates 50 species of birds commonly found in naturally occurring trees in eastern Australia. Just as these birds are dependent on our flora, so is the future survival of man.

The Australian Flora Foundation

This was proclaimed on the 14th August, 1981, at the University of Sydney by Dr. Lloyd Evans, President of the Australian Academy Of Science, and supported by Neville Wran, Premier of New South Wales. The reception was sponsored by Meadow-Lea Margarine, with a major contribution by the National Parks and Wildlife Service of New South Wales. The Society (N.S.W. Region) has been responsible for the promotion, including costs to this date, and has donated \$1,000.00.

The objective of the Foundation is "to foster research into biology and cultivation of the Australian Flora". Basic and applied research is vital for the survival of the Australian Flora in the wild and its development for horticulture in botanical gardens, parks and gardens. The Foundation provides an opportunity for government, the professional scientist, the business community and the general public to collaborate in a national emergency.

A national emergency? Is this over-dramatising the position?

I am convinced that now is the critical time if most of the surviving Australian flora is to be saved. I am hoping that the concerned citizens of Australia will show their alarm by becoming a sponsor-member of the Foundation by sending a donation of \$25.00. Never before, or I feel in the future, will such an amount be so important, will have so much impact, will carry such a message, will get so much done. Rallies and demonstrations, petitions and meetings, letters to Members and the Press, all have their place in our democratic society and by all means do this if you wish, but a show of support by a \$25.00 donation will impress much more.

For the love of the Australian Flora, the Australian way of life, act now by sending \$25.00 to The Australian Flora Foundation, C/- The Editor, Australian Plants.