

# The Commercial Development of Australian Native Ornamental Plants

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## INTRODUCTION

It has been estimated that Australia has up to 30,000 native plant species, a large proportion of which is not in general cultivation. Currently there is some commercial interest in selection and development of native plants for three main markets: cut flower production, pot plant production, garden and landscape planting.

## CUT FLOWERS

Considerable development of new plant selections has occurred in this area. A major export market has been developed for a number of genera over the last 20 years, following work of researchers in the state Departments of Agriculture, commercial producers, and enthusiastic amateurs. Funding has been largely provided by the Rural Industries Research and Development Corporation (RIRDC), which is a Federal Government body set up to make most effective use of research and development funds.

Plantation production of native cut flowers is a relatively recent development in Australia. Harvesting of stems from the native bush has been the main source of many native flowers, however, public opinion has built up against this practice on environmental grounds. This has provided a major stimulus to the establishment of commercial field plantations.

**Geraldton Waxflower.** *Chamelaucium uncinatum* and a number of related species are tall-growing evergreen shrubs native to the southern part of Western Australia. They have been widely exploited for cut flower production, initially from bush-harvested material, but more recently selected flowering forms have been cultivated in plantations in many states. Most selected flowering forms have been selected from natural stands in Western Australia.

During the 1980s New South Wales Department of Agriculture (NSWDA) undertook a breeding programme on *Chamelaucium* resulting in a number of hybrids, some of which were tall growing types suited to cut flower production and some more compact forms which have potential as flowering pot lines. The Department sold the marketing rights to the commercial sector and these hybrids are now coming into cultivation.

There are a number of plantations near Gatton College and, in the heavy soils of southeast Queensland, *Phytophthora cinnamomi* is a serious problem. Some of the NSWDA hybrids are exhibiting strong field tolerance to this pathogen and at Gatton College we are currently researching grafting techniques for sensitive cultivars using these more tolerant hybrids as rootstocks. Side veneer grafts and side veneer cutting grafts have given more than 90% success rates.

**Rice Flower.** *Ozothamnus diosmifolius* (syn. *Helichrysum diosmifolium*) has been bush-picked in eastern Australia over the last 20 years. The Queensland Department of Primary Industries (QDPI), Redlands Research Station, has now selected a range of types with white or pink flowers. Private growers have also been active in selecting improved forms. Graham and Ester Cook of Helidon, Queensland, have selected an improved white and an improved pink form which have now been protected by plant breeders' rights (PBR).

In developing a commercial industry a number of problems were encountered by QDPI. The plant's cultural requirements were not well understood, propagation techniques had to be improved, and postharvest requirements determined. Research to tackle these problems was begun in 1992 and there is funding until at least 1997. Trials have been established to document yields, longevity, and pest and disease problems. Yields can be high (10 to 50 stems per plant per year) but 10% to 20% plant losses per year are not uncommon due to root congestion, root-knot nematode, and phytophthora root rot.

A 10- to 12-week flowering season is possible with newer strains and good choice of planting location. Vase life is excellent. Some problems have been experienced with post-harvest foliage blackening if stored at high temperatures. Propagation by conventional softwood tip cuttings is satisfactory. QDPI has received provisional PBR protection for a selection named 'Redlands Sandra' and a growing and marketing brochure has been released.

**Kangaroo Paw.** The genus *Anigozanthos* is native to the southwest of Western Australia and is widely used as a garden perennial and as a cut flower. There have been many selected forms introduced into the trade in Western Australia, especially long stemmed types for cut flower use.

The "Bush Gems" series were bred by Merv Turner, a nurseryman from Victoria, and a number of named colour forms are widely used. *Anigozanthos manglesia* 'Bush Dawn' is a vibrant yellow form and 'Bush Sunset' is a deep red selection.

A selection of naturally dwarf kangaroo paws has been developed by New South Wales Department of Agriculture at the Gosford Research Station. These dwarf forms were developed using embryo rescue techniques in tissue culture and are particularly suited to flowering pot plant production. A wide range of colour forms are available in this series. The plants are fast-growing and will flower in 12 to 14 weeks from tissue culture.

**Banksia.** Professor Margaret Sedgley of the University of Adelaide has been involved for some years in the development of improved cultivars of *Banksia* for ornamental horticulture use—especially the cut flower industry. The programme has involved the development of a range of characters, including bloom number, quality and colour, and disease tolerance of the plant. *Banksia* species under investigation include *coccinea*, *hookeriana*, *menziesii*, and *prionotes*.

A selection of *B. hookeriana* has been registered under the cultivar name 'Waite Orange'. It is believed to be an interspecific hybrid between *B. hookeriana* and *B. prionotes* and it is a very vigorous grower with a much higher yield of blooms than either parent.

The intent of this programme is that once superior cultivars have been selected, major commercial gains will be derived from the establishment of flowering plantations of clonal material. This will require the development of vegetative

propagation techniques to propagate the clonal selections. Work is underway on *B. hookeriana*, *B. prionotes*, and 'Waite Orange' to develop techniques for propagation by cuttings.

The time span of root formation in *Banksia* cuttings has been very long with some clones taking up to 1 year to develop roots. Professor Sedgley's group is also pursuing the potential for the use of tissue culture in the commercial propagation of *Banksia* clones.

**Waratah.** *Telopea speciosissima* is the New South Wales floral emblem and it has been grown for some time as a woody plantation cut flower crop there. A number of improved forms have been selected, including a white cultivar which was recently introduced to the trade. The structure of the flower is highly unusual and there is a strong demand. It has been widely grown in New Zealand as a cut flower crop for export, to the chagrin of the Australian cut flower industry.

**Koala Fern.** *Caustis blakei* is a sedge which is indigenous to southeast Queensland and northeast New South Wales in open woodlands. It is extensively bush harvested for its feathery stems which are popular as cut foliage in flower arrangements. It can be used in the fresh green state, or it can be dried and dyed a number of bright colours. Vegetative propagation has not been successful and we must rely on seed. Unfortunately fruit set is very low, for every 100 flowers only eight or nine fruits are set. Gatton College is currently undertaking a research project which examines factors influencing fruit set as well as developing a commercial tissue culture propagation process for *Caustis* so that it can be cultivated as a plantation crop.

**Geebung.** *Persoonia virgata* is another bush-harvested species used for floral arrangements. It is a member of the Proteaceae with single yellow axillary flowers. The seed has a hard woody endocarp which acts as a barrier to germination. Work is under way at Gatton College to improve its propagation performance which would make larger quantities available for commercial plantations. Aspects of seed, cutting, and tissue-culture propagation are being examined. At present seed appears to be most promising and good germination is being achieved with removal of the fruit and the woody endocarp.

**Christmas Bell.** *Blandfordia grandiflora* flowers from November to February. It is a rhizomatous member of the Liliaceae and indigenous over much of central and southern New South Wales. It is in demand as a cut flower and some growers in New South Wales are now exporting it to Japan. Work has been carried out at the University of Sydney to gain an understanding of the factors which regulate its flowering. The two main factors involved in floral initiation appear to be rhizome size and vernalisation.

## POT PLANTS

Breeding and selection of annuals and perennials has been carried out both by state Departments of Agriculture researchers and commercial producers, with many projects being funded by the Horticultural Research and Development Corporation, using funds collected through a grower levy.

**Brachycome Daisy.** In 1989 Plant Growers Australia in Melbourne started a *Brachycome* breeding programme with government assistance. The aims were to

produce a range of cold hardy *Brachycome* cultivars; to increase the range of plant and foliage forms; to increase the range of flower colours, in particular yellow; and to produce plants that could be protected under PBR and earn royalties for Australia.

So far seven cultivars have been protected and released in Australia. Trials have been carried out in several countries and plants will be released in Europe, U.S.A., Canada, New Zealand, South Africa, and Japan in the near future.

*Brachycome* 'Lemon Drops' and 'Lemon Twist' add a totally new colour to the previous range of mauves, pinks, and white. 'Pink Haze' is a hardier pink-flowered cultivar than previously available. 'Happy Face' is the most outstanding of the series and has large cerise flowers and interesting foliage. It has also proved hardy in cold areas of Australia. To date, royalties of over \$20,000 from 'Happy Face' have been donated to World Vision to help needy children.

**Other Native Daisies.** A large selection programme, supported by the HRDC, with native daisies was carried out at Queensland's Redlands Research Station. An extensive selection programme has identified several species with horticultural potential, many of which can be produced in flower within 14 weeks from sowing. The project also investigated germination requirements and environmental influences, including photoperiod, on growth and flowering. Some of the more promising types identified during this project include:

***Acroclinium roseum* (syns. *Rhodanthe chlorocephala* ssp. *rosea* and *Helipterum roseum*).** Annual "paper daisy" with long flowering stalks highly suited as a cut flower and for massed border displays. Germinates easily but woolly seed is problematic in automated seeding machinery. Flowering promoted by long days.

***Helipterum floribundum* (syn. *Rhodanthe floribunda*).** Annual, although short-lived perennials may occur in cultivation. Germination can be difficult. Soaking seeds in gibberellic acid is beneficial. Flowering is promoted by long days and cool nights during early stages of growth. Suitable as a hanging basket plant.

***Schoenia filifolia* ssp. *filifolia* (syn. *Helipterum filifolium*).** Short-lived perennial in warmer zones. Long-day plant requiring cool temperatures during the early stages of growth for floral display. Suitable for hanging baskets.

***Hyalosperma cotula*.** Small annual paper daisy. Seeds require treatment at 50C for 2 to 3 months for germination. In the wild this plant germinates after bushfires, may respond to smoke treatments. Suitable as a miniature flowering potted plant.

***Lawrencella rosea*.** This paper daisy tends to be perennial, forming short twiggy bushes. Short days required for production of intense pink flowers.

***Brachycome halophila*.** Soft-petalled flower similar shape to *Cineraria*. Annual with potential as bedding plant. Day-neutral flowering.

**Mulla Mulla.** The genus *Ptilotus* contains over 80 species, several of which have great potential for use as flowering pot plants. It belongs to the Amaranthaceae and the inflorescence is a feathery head of bract-like florets. *Ptilotus exaltatus* has larger and more colourful spikes than most other species and is receiving greater attention as a cultivated plant. Flowering plants of *P. exaltatus* in pots won a

“Flower of the Year” award in Europe in 1993 and this has stimulated commercial interest in its development within Australia.

Seed germination is very variable but can be improved by scarification to remove the perianth. Propagation by cuttings is limited because of the small number of vegetative stems produced by most species. Tissue culture is now well developed.

**Sturts Desert Pea.** *Clianthus formosus* (syn. *Swainsona formosus*) is one of the most spectacular of Australia's wildflowers. The species has been widely grown as a garden plant but tends to be rather short-lived in cultivation.

There are various structural forms in cultivation, ranging from prostrate ground covers to upright bushy types. Selections have been made of types suitable as a flowering pot line, a hanging basket plant, and a cut flower crop. A number of different flower colours have been selected, which provides greater interest in this species.

### GARDEN AND LANDSCAPE

Little government funding has been available for research and development involving native woody species and most of the development and selection of improved forms has been carried out by commercial growers and enthusiastic amateurs. The establishment of the Plant Breeders Rights scheme in Australia during the latter part of the 1980s has been a major incentive for growers and breeders to introduce new plants.

**Grevillea.** There are some 250 species of *Grevillea*. It is a member of the Proteaceae and widely used as a garden shrub in Australia. In Queensland a range of tropical and subtropical hybrid forms with large terminal inflorescences have been selected. *Grevillea* ‘Robyn Gordon’ is a low-growing shrubby type about 1 m high. It is a hybrid between *G. banksii* and *G. bipinnatifida* and the original cross occurred in the garden of Mr. David Gordon of Glenmorgan in Queensland. ‘Robyn Gordon’ is a very free-flowering form with brilliant red flowers and it will flower almost continuously in warmer areas of Australia.

*Grevillea* ‘Sandra Gordon’ is another hybrid developed by David Gordon. The parents of this selection are *G. sessilis* and *G. pteridifolia*. This is a much taller growing shrub to about 4 m with bright yellow flowers.

A wide range of other selected forms of *Grevillea* for cultivation in the warmer parts of Australia include: ‘Honey Gem’, with large orange-yellow flowers; ‘Honey Wonder’, a selected form of the previous type with variegated foliage; ‘Pink Surprise’, a tall growing type with bright pink flowers; ‘Majestic’, reddish-pink flowers; ‘Superb’, reddish-orange flowers; ‘Sylvia’, red flowers; ‘Golden Yul-lo’, a recently introduced form with golden yellow flowers; and ‘Crimson Yul-lo’, a yet to be released form with crimson red flowers.

**Hardenbergia.** *Hardenbergia violacea* is a native climbing plant with a rampant and straggling growth habit. The selection ‘Bushy Blue’ originated as a chance seedling in a nursery in California. It has compact growth and develops as a low, bushy shrub. It is extremely free flowering for an extended period over winter and early spring.

**Golden Penda.** *Xanthostemon chrysanthus* a large shrub or small tree from the rainforests of north Queensland. It was brought into cultivation by Fairhill

Nursery, Yandina, Queensland. Initially it was propagated by seed and the lack of availability of seed restricted its availability. It can now be propagated by cuttings which has increased availability. Golden penda was selected by the Queensland Nursery Industry Association as its major plant release during the 1988 World Expo in Brisbane under the name 'Expo Gold'.

The range of native plants covered in this paper is only a small sample of the selection and development work under way in Australia on native plants. Over the next 10 to 20 years we will see a range of exciting newer plants come into cultivation which will extend the range of Australian native plants with commercial appeal.

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