RIRDC Completed Projects for 2006-2007 and Research in Progress as at June 2007

Wildflowers & Native Plants

September 2007

RIRDC Publication No 07/006
Foreword

The Wildflowers & Native Plants Research in Progress Report, June 2007, contains short summaries of continuing projects as well as those that were completed during 2006-2007. This program aims to provide R&D to support the development of a profitable, commercially focussed and sustainable Australian wildflower and plantation-grown Proteaceae industry.

The Program has four objectives to:

- understand, strengthen and develop markets
- improve existing products and develop new ones
- provide profitable and sustainable productions systems
- enhance the human capital of the industry

The complete report on all RIRDC programs is available at our website http://www.rirdc.gov.au

This report is the newest addition to our extensive catalogue of over 1600 research reports, videos and CD-Roms of projects supported by RIRDC. Please contact us for the latest publications catalogue or view it on our website:

- downloads at www.rirdc.gov.au/reports/Index.htm
- purchases at www.rirdc.gov.au/eshop

Peter O’Brien
Managing Director
Rural Industries Research and Development Corporation
## Contents

### 1.6 Wildflowers & Native Plants - Completed Projects

<table>
<thead>
<tr>
<th>Project No.</th>
<th>Project Title</th>
<th>Researcher</th>
<th>Phone</th>
<th>Organisation</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAN-235A</td>
<td>Flowers by Sea – Improving market access for Australian wildflowers</td>
<td>Dr Jenny Ekman</td>
<td>(02) 4348 1900</td>
<td>NSW Department of Primary Industries</td>
<td>1</td>
</tr>
<tr>
<td>DAN-234A</td>
<td>Flannel Flowers the Year Round: A model Production System</td>
<td>Dr Ross Worrall</td>
<td>(02) 4348 1900</td>
<td>NSW Department of Primary Industries</td>
<td>3</td>
</tr>
<tr>
<td>DAN-252A</td>
<td>Australian wildflower and native plants program R&amp;D plan review and new plan covering 2007-2012.</td>
<td>Ms Bettina Gollnow</td>
<td>(02) 4640 6437</td>
<td>NSW Department of Primary Industries</td>
<td>4</td>
</tr>
<tr>
<td>DAW-107A</td>
<td>Nutrient management of waxflower for quality and yield under adequate irrigation levels</td>
<td>Mr. Gerry Parlevliet</td>
<td>(08) 9368 3219</td>
<td>Department of Agriculture (WA)</td>
<td>6</td>
</tr>
<tr>
<td>UA-67J</td>
<td>Development of novel eucalypt hybrids</td>
<td>Prof Margaret Sedgley</td>
<td>(08) 8303 7249</td>
<td>The University of Adelaide</td>
<td>7</td>
</tr>
</tbody>
</table>

### 1.6 Wildflowers & Native Plants – Research in Progress

<table>
<thead>
<tr>
<th>Project No.</th>
<th>Project Title</th>
<th>Researcher</th>
<th>Phone</th>
<th>Organisation</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAN-231A</td>
<td>On-farm evaluation of grafted wildflowers for commercial cutflower production</td>
<td>Mr Jonathon Lidbetter</td>
<td>(02) 4348 1931</td>
<td>NSW Department of Primary Industries</td>
<td>11</td>
</tr>
<tr>
<td>DAW-111A</td>
<td>Maximising root quality of waxflower tube stock suitable for field planting</td>
<td>Dr. Kevin Seaton</td>
<td>(08) 9368 3244</td>
<td>Department of Agriculture (WA)</td>
<td>12</td>
</tr>
</tbody>
</table>
### Project Title:
**Flowers by Sea – Improving market access for Australian wildflowers**

<table>
<thead>
<tr>
<th>RIRDC Project No.:</th>
<th>DAN-235A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher:</td>
<td>Jenny Ekman</td>
</tr>
<tr>
<td>Organisation:</td>
<td>NSW Department of Primary Industries</td>
</tr>
<tr>
<td>Locked Bag 26,</td>
<td>GOSFORD NSW 2250</td>
</tr>
<tr>
<td>Phone:</td>
<td>(02) 4348 1900</td>
</tr>
<tr>
<td>Fax:</td>
<td>(02) 4348 1910</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:jenny.ekman@dpi.nsw.gov.au">jenny.ekman@dpi.nsw.gov.au</a></td>
</tr>
</tbody>
</table>

### Objectives
- To investigate whether some species of native cut flowers can be stored long enough to allow export to Japan by sea freight and still retain acceptable outturn quality and vase life.
- To test whether using sea freight to export Australian flowers and foliage to Japan is feasible and likely to offer significant cost savings.

### Background
The Australian native cut flower and foliage industry exports a significant proportion of its production to Japan. Such exports are entirely by air. Air transport is expensive, occasionally unavailable and offers little control of temperature and humidity. Using sea instead of air transport could reduce freight costs by up to 50%, a saving that would add directly to grower’s returns.

### Research
The first stage of the project involved a series of storage and vase life tests on various cut flower species. Tests investigated whether flowers still retained at least 7 days vase life after storage for 0 to 4 weeks. A number of treatments were also trialled to see if storability could be improved. These included pre-storage pulses, sprays, packaging methods and storage atmospheres. The second stage of the project used an actual shipment of flowers and foliages to Japan to assess outturn quality, the logistics of sea freight, and the costs / benefits incurred.

### Outcomes
The laboratory trials indicated that the best candidates for sea freight to Japan were Kangaroo paws and NSW Christmas bush. The initial quality of the plant material was the most important factor affecting storability. Postharvest treatments had smaller effects on postharvest storage life. Geraldton wax cv, My Sweet Sixteen and Protea Pink Ice could potentially have acceptable vase life after 2 weeks storage. Storage life of Pink Ice can be maximised by pulsing with a 3 or 6% glucose solution to reduce the onset of leaf blackening. *Backhousia myrtifolia*, *Eucalyptus cv.* Bronze Orange Red, Pink waxflower, *Protea eximia* cv. Duchess and White cassinia all had less than 7 days vase life after 2 weeks storage.

A number of issues were encountered during the trial shipment of flowers and foliage to Japan. These included inaccuracies with the phytosanitary certificate, inadequate labelling of cartons, difficulties accessing products required for quarantine inspection and presence of live insects in some cartons. In general, products in good condition initially retained their quality and were saleable in the Japanese market; products in fair condition deteriorated further during storage and were not saleable. Wet storage (compared to dry storage) improved outturn quality and vase life for kangaroo paws. No other benefits were observed for any of the packaging treatments applied.
It is physically possible to ship some species of flowers and foliage to Japan. Initial condition, storage temperature and relative humidity generally have more effect on outturn quality than postharvest treatments such as dips and pulses. Sea freight reduced the cost of export by 40% but may have decreased product value at auction by approximately 10%. Sea freight is potentially cost effective, especially for bulk, commodity type products, but this should be assessed on a case by case basis. Moreover, a number of supply chain issues must be addressed if sea freight is to be conducted effectively.


Ekman, J.H. When Banksias go boating – the feasibility of exporting flowers by sea. Australian Native Flower conference, Brisbane, May 2005


**Implications**

**Publications**
2. To improve existing products and develop new ones

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Flannel Flowers the Year Round: A model Production System</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIRDC Project No.:</td>
<td>DAN 234A</td>
</tr>
<tr>
<td>Researcher:</td>
<td>Dr. Ross Worrall</td>
</tr>
<tr>
<td>Organisation:</td>
<td>NSW Department of Primary Industries</td>
</tr>
<tr>
<td>Phone:</td>
<td>(02) 43481900</td>
</tr>
<tr>
<td>Fax:</td>
<td>(02) 43481910</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:ross.worrall@dpi.nsw.gov.au">ross.worrall@dpi.nsw.gov.au</a></td>
</tr>
</tbody>
</table>

**Objectives**

To promote the development of the Australian native flower industry by providing cultural and post harvest information and new varieties that will enable flannel flowers (*Actinotus helianthi*) and other Australian native cut flowers to be grown reliably in protected cultivation.

**Background**

There is a well established domestic and export market for flannel flower flowers but demand exceeds supply, especially with bush picking expected to be severely reduced in the future. However prior to this project they have proven to be unreliable in cultivation, difficult to propagate and supply was essentially limited to spring and early summer. The Flannel Flower Forum identified the major constraints limiting their year-round cultivation- especially lack of suitable varieties, cultural information, propagation and the effect of root diseases. Out of season flowers also command a significant premium. Overcoming production constraints will provide employment opportunities for regional Australia.

**Research**

Root diseases causing losses in commercial production were identified and effective control measures for use by commercial growers were developed. A high yielding, year-round flowering elite material with a long post harvest life was also developed. It was found that shading and growth regulators improved the stem length of flowering plants. The optimal level of fertilisers was determined. Contrary to previously published information it was found to be very responsive to fertilisers, especially nitrogen and phosphorus. A protocol was developed for germinating seed, greatly improving existing germination rates and percentages. New crops were also trialled to identify those with commercial potential.

**Outcomes**

The key impediments to cultivation to develop a commercially viable production system for flannel flowers were overcome i.e. (1) control of root diseases especially by improving growing medium aeration, (2) development of high yielding, year-round flowering elite material with a long post harvest life (3) increasing stem length using growth regulators and shading (4) improving cultural practices (5) improving propagation efficiency and (5) trialling of new crops to identify those with commercial potential. As a result of this project 15 growers are now producing flannel flower as a cut flower crop in protected cultivation. It also provides the opportunity to expand the industry by introduction of new crops in protected cultivation.

**Implications**

This project has shown that through overcoming impediments to cultivation and the development of new varieties that flannel flower in protected cultivation is a profitable new product for the Australian native cut flower industry. Other products also show this potential. It will also assist in curtailing environmentally harmful practices associated with bush-picking.

**Publications**


**Project Title:** Australian wildflower and native plants program R&D plan review and new plan covering 2007-2012.

<table>
<thead>
<tr>
<th>RIRDC Project No.:</th>
<th>DAN 252A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher:</td>
<td>Bettina Gollnow</td>
</tr>
<tr>
<td>Organisation:</td>
<td>NSW Department of Primary Industries</td>
</tr>
<tr>
<td>Phone:</td>
<td>02 4640 6437</td>
</tr>
<tr>
<td>Fax:</td>
<td>02 4640 6300</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:bettina.gollnow@dpi.nsw.gov.au">bettina.gollnow@dpi.nsw.gov.au</a></td>
</tr>
</tbody>
</table>

**Objectives**

- To engage a broad range of industry stakeholders in the review of the 2000-2005 R&D plan for the Wildflowers and Native Plants Program. At the same time, to involve stakeholders in the development of a new 5-year R&D plan (covering 2007-2012).
- To assess the successful adoption of new crops or products by the commercial industry and review the adoption of new technologies and management practices developed through RIRDC funded research. This objective aimed to evaluate extension and adoption pathways.
- To prepare a draft 5 year plan from the results of the industry survey and validate this as the new 5 year R&D plan (covering 2007-2012), with key industry stakeholders, primarily via a national meeting held in conjunction with the DAFF funded Industry Partnerships Program (IPP).

**Background**

The RIRDC Wildflower and Native Plants Program 5 year R&D plan expired in 2005. It supported a significant number of diverse research projects around the country.

There was a strategic opportunity to gather inputs from industry to review the previous 5 year plan and determine the directions for the new 5 year plan, as a linked project to the DAFF funded Industry Partnerships Program (IPP). Both programs stood to benefit from this link as there is much common ground.

Strategic and commercially applicable R&D is critical to underpin industry efforts to lift Australia’s image as a supplier of new, innovative and high quality products in local and world markets. This will assist existing enterprises to be more profitable and will attract new investment. The RIRDC R&D plan is the point of reference for industry and researchers to use in developing new research and development projects.

**Research**

The research aimed to review the previous R&D plan and develop a new plan in conjunction with the IPP 2007 Wildflower industry summit. An extensive communication plan was developed to alert stakeholders about the opportunity for them to be involved in this project. The national survey gathered information about the wildflowers and native plants industry through participating stakeholders, collected feedback about the outputs and outcomes of the 2000-2005 R&D plan and identified areas of greatest need for future R&D. The survey also assessed the uptake of RIRDC funded R&D projects by the various stakeholder groups and how researchers develop project concepts with the industry. The national workshop allowed a cross section of industry stakeholders to prioritise the information gathered through the survey and interact with each other to debate some of the key issues. The discussion also aimed to identify the barriers to R&D achieving maximum benefits for investors and the industry. Information was also gathered by personally interviewing a selection of industry stakeholders. These inputs were used to review the 2000-2005 R&D plan and to develop the new 5 year plan to span the years 2007 to 2012.
Outcomes

A broad section of industry stakeholders were made aware of and became involved in reviewing the 2000-2005 R&D plan and developing a new 5-year plan to address industry priorities. Industry inputs were gathered through a national survey, a one-day national workshop, presentations at three state industry events and individual interviews. A strategic review of the industry and of the previous 5 year plan was prepared for RIRDC and the industry to use as a resource. A successful national R&D workshop was conducted to review recent R&D and set directions for the new 5 year plan. It was viewed as a positive experience by all 37 stakeholders who participated. It was recommended that another workshop be hosted by RIRDC part way through the life of the new R&D plan. A new R&D plan to underpin future R&D projects has been drafted and incorporates comments from a wide range of stakeholders, estimated to represent up to 20% of the industry. Some of the barriers restricting access to and uptake of R&D outcomes have been identified. Articles in industry media (newsletters, magazines, websites) have raised awareness of R&D and of the RIRDC industry program, and will promote the key areas of focus for R&D from now until 2012.

Implications

The draft 5 year R&D plan 2007-2012 sets clear objectives for the industry and will assist the newly formed national industry body, Wildflowers Australia Ltd to focus on a number of key issues. The identified strategies and targets reflect current and future needs identified by industry stakeholders during this project. The nominated targets will be met through a mix of outcomes still flowing from the 2000-2006 R&D program and by industry support of several new proposed projects. The results of completed R&D will be enhanced through the adoption of the recommendations made. These include a more diverse communication process to stakeholders.

Publications

Bettina Gollnow: Leading the wildflower industry forwards – your chance to help develop the next five year industry R&D plan. Australian Flower Industry issue # 14, March 2007, pp 36-37.


RIRDC Wildflowers and Native Plants Program 5 year R&D Plan 2007-2012
Project Title: Nutrient management of waxflower for quality and yield under adequate irrigation levels

<table>
<thead>
<tr>
<th>RIRDC Project No.:</th>
<th>DAV-107A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher:</td>
<td>Kevin Seaton</td>
</tr>
<tr>
<td>Organisation:</td>
<td>Western Australian Department of Agriculture and Food</td>
</tr>
<tr>
<td></td>
<td>Bentley Delivery Centre WA 6983.</td>
</tr>
<tr>
<td>Phone:</td>
<td>08 9368 3244</td>
</tr>
<tr>
<td>Fax:</td>
<td>08 9 368 2958</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:kseaton@agric.gov.wa.au">kseaton@agric.gov.wa.au</a></td>
</tr>
</tbody>
</table>

Objectives

To develop a strategy for managing nutrients and irrigation in waxflowers to maximise growth and flower quality, base on nutrient levels, knowledge of deficiency and toxicity symptoms and growth response relationships grower access to the best available knowledge.

Background

Little detailed information exists on the nutrient requirements of new waxflower hybrids, their irrigation requirements or effects of salinity. Preliminary discussions with growers in the industry indicated a need for nutrient work to provide a concrete foundation for proper nutrient management practices for waxflower, particularly for new waxflower hybrids. It also emphasised a need to develop systems that took into account the importance of adequate irrigation.

Research

Deficiency symptoms were determined for 5 macro nutrients (N, P, K, Ca, Mg) and 7 trace elements (Fe, Mn, Zn, Cu, B, Co, Mo). Fertiliser formulations based on pot and field trials were packaged to growers for in field use. These were evaluated in terms of correcting nutrient deficiency symptoms and leaf tissue analysis. Delivery symptoms were developed to fit within irrigation systems to optimise yield. Nutrient trials were run on growers’ properties under adequate irrigation using banks of tensiometers. A series of workshops were held across Australia to relate finding of project to industry.

Outcomes

Applying the correct balance of nutrients in small frequent dose (rather in single large dose, which is common in the industry) increased stem yields by 30 to 40%. Waxflowers responded to improved nutrient application, especially the newer Pearl flower hybrids. Growers are now using these techniques with some applying tailored fertiliser program according to crop growth phases. Stem yield and quality has substantially improved

Industry interest in the project is high with many requests for information and help to develop programs for their particular farm situation.

Implications

This project has shown that the use of a correct balance of nutrients delivered in an effective way in an environment of adequate irrigation can increase yields compared to existing practices. Consequently, the industry is able to profitably produce high yielding high value waxflowers for export. And gain the benefits of these new varieties.

Publications


## Objectives
To finalise optimal clonal propagation methods for selected superior eucalypt varieties from UA-52A and to continue with selection of superior varieties for both the floriculture and nursery & garden industries; with a focus on bright colours, such as reds and pinks, and a range of varieties for year round production, including summer months.

To undertake Plant Breeders Rights trials for the selected varieties for the purposes of PBR registration.

To develop a Business Plan to attract investment for long-term eucalypt breeding.

## Background
An earlier RIRDC Project UA-52A (Breeding of eucalypt bud and flower lines) lead to the selection of 13 superior varieties of ornamental eucalypt, as well as methodologies for selection and clonal propagation, and information on production systems and postharvest treatments. The next step to commercial release of these varieties was Plant Breeders Rights registration and variety testing.

## Research
Selection of varieties resumed using criteria reported in RIRDC Publication No 04/163, focussing on bright flowers and summer flowering.

Different species were tested as rootstocks: *E. camaldulensis*, *E. stricklandii*, *E. caesia* ssp. *caesia*, *E. caesia* ssp. *magna*, *E. gillii* and *E. calophylla*. Selected varieties were coppiced in late summer 2006 to produce juvenile material to maximise outcomes in the final 12 months of the project.

The UPOV test guidelines for Eucalypts were studied in anticipation of PBR trials.

A Business Plan was developed to seek long-term funding.

## Outcomes
A further 23 varieties were selected, during this project resulting in a total of 36 varieties under development. Selected varieties came from Types 1, 2, 3 and 4, and most have red flowers in later Spring and Summer and glaucous leaves. These varieties underwent testing for clonal propagation by grafting and cuttings.

*E. camaldulensis* was rejected as a rootstock due to incompatibility. Closely related species showed more promise, with successful propagation of most varieties being achieved in the last six months of the project. Coppicing of the selected varieties produced juvenile material for cuttings, however trials were inconclusive.

PBR trials and variety testing were not completed due to insufficient time and material.
**Implications**

The demand for new varieties of ornamental eucalypts for the Australian floriculture and nursery & garden industries has continued to drive research into this area. The potential for new varieties in these market sectors is high, given the demand for the few varieties currently available. The ongoing water restrictions, while affecting overall sales in the Australian Nursery & Garden Industry, have opened the door for water-miser native plant varieties in the home garden.

**Publications**


Eight industry presentations by Dr Kate Delaporte, including a special review on of research to Eucalypt industry players at the Centre for Native Floriculture, University of Queensland, Gatton Campus Qld (30th May 2005), and as an invited speaker to the Australian Springtime Flora Festival, Gosford, NSW, on 9th September 2006, for the ANFPG.
## Project Title:

### Market development and commercial production of five native foliage products

**RIRDC Project No.:** DAQ-324A  
**Researcher:** Joanna Srhoj  
**Organisation:** Department of Primary Industries & Fisheries  
**PO Box 1054**  
**MAREEBA QLD 4880**  
**Phone:** 07 4048 4600  
**Fax:** 07 4092 3593  
**Email:** jsmanagement@bigpond.com

### Objectives

1. To raise awareness of the five foliage products in the domestic market as a strategy to increase sales.  
2. To improve the consistency and quality of product delivered to market through the development of product specifications based on domestic market research.  
3. To provide improved and more detailed agronomic, market and economic information to industry relevant to both tropical and subtropical growing areas.  
4. To facilitate an increase in industry size and capability in tropical and subtropical growing areas.  
5. To assess the susceptibility of the five foliage species to root knot nematode and *Phytophthora cinnamomi*.  
6. To deliver grower education and training through workshops and meetings to encourage industry collaboration.

### Background

Two previous RIRDC funded research projects (DAQ-262A and DAQ-299A) have evaluated the potential of north Queensland native foliage species for the cut flower and foliage industry. Five native foliages were selected on the basis of vase life, market acceptance, vigour, resistance to pest and disease and yield for further commercialisation. *Stenocarpus* ‘Forest Lace’, *Stenocarpus* ‘Forest Gem’, *Lomatia fraxinifolia*, *Athertonia diversifolia* and *Grevillea baileyana* were included in this project which aims to facilitate the development of a native foliage industry in north Queensland and other parts of subtropical Australia.

### Research

The research has involved the following key activities:

1. Consumer trials to raise awareness of the products  
2. Market research with wholesalers  
3. Two field trials based in north Queensland (Southedge and Yungaburra) and one based in southern Queensland (Cleveland)  
4. Nematode resistance screening on all five species  
5. Phytophthora resistance screening on all five species  
6. Grower education and training

### Outcomes

All five foliage species show potential for commercialisation with *Stenocarpus* ‘Forest Gem’ and *Stenocarpus* ‘Forest Lace’ leading the process. Market research has revealed that all five products have a place in modern retail floristry; however the challenge for industry will be marketing and production of a high marketable yield per plant. All five species show resistance to nematodes and *Phytophthora* when compared to susceptible hosts. Data on yield, pests and diseases, nutrition, grading and packaging, marketing and economics has been collected from field trials and included in information kits. Retail florists have shown a keen interest in all five products.
### Implications

1. Retail florists have indicated that they would regularly use all products if readily available.
2. Retail florists have indicated expected prices, preferred stem lengths and rated the versatility of each product.
3. Industry needs to standardise quality and bunch sizes.
4. All five species demonstrate resistance to nematodes and Phytophthora when compared to susceptible controls.
5. Improving marketable yield for all species is a priority.

### Publications

2. To improve existing products and develop new ones

**Project Title:** On-farm evaluation of grafted wildflowers for commercial cutflower production

<table>
<thead>
<tr>
<th>RIRDC Project No.:</th>
<th>DAN-231A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date:</td>
<td>01/09/2004</td>
</tr>
<tr>
<td>Finish Date:</td>
<td>30/05/2009</td>
</tr>
<tr>
<td>Researcher:</td>
<td>Mr Jonathon Lidbetter</td>
</tr>
<tr>
<td>Organisation:</td>
<td>NSW Department of Primary Industries</td>
</tr>
<tr>
<td>Phone:</td>
<td>(02) 4348 1931</td>
</tr>
<tr>
<td>Fax:</td>
<td>(02) 4348 1910</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:jonathan.lidbetter@agric.nsw.gov.au">jonathan.lidbetter@agric.nsw.gov.au</a></td>
</tr>
</tbody>
</table>

**Objectives**

- Prove the benefits of grafted plants in the wildflower industry though valid on-farm financial data on the establishment of grafted perennial crops and potential cost/ benefit.
- Foster the production of new product lines on farm in a profitable and sustainable manner.
- Improve the viability of some currently difficult to grow or low yielding product lines and expand their suitability to a greater area within Australia.
- Improve the efficiency of Australian flower growers by creating greater yield certainty and avoiding plant losses or costly repeat applications of fungicides to control root diseases.
- Evaluate new graft combinations at a number of sites around Australia.

**Current Progress**

Grafted plants from over 40 different graft combinations from 11 genera have been planted at 12 sites in NSW, Victoria and WA. Weather extremes have seen some sites with limited water and others with over 600mm rain in a single month. Assessment over such a wide range of sites has facilitated the fast-tracking of the selection process.

Commercially harvestable stems have been picked from most species within 12-18 months of planting and sold locally or on the export market. Some plants are showing clear economic returns at this early stage. Flowering stems have already been harvested from plants in the genera *Eucalyptus (Corymbia)*, *Chamelaucium*, *Eremophila*, *Geleznowia*, *Boronia*, *Pimelea*, *Darwinia* and *Banksia*.

A significant number of new varieties and even species (including *Regelia velutina* and *Verticordia grandis*) are becoming available and are progressively being added to the selection available for growers in the project.

Considerable differences in results are being observed between sites leading to re-evaluation of rootstock selection for some sites. New rootstock lines continue to be selected to fill identified gaps or overcome problems as they occur. Development of clonal propagation techniques for *Corymbia* by the forestry industry is an opportunity we will explore further for rootstock development.
**Project Title:** Maximising root quality of waxflower tube stock suitable for field planting

<table>
<thead>
<tr>
<th>RIRDC Project No.:</th>
<th>DAW-111A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Date:</td>
<td>01/10/2003</td>
</tr>
<tr>
<td>Finish Date:</td>
<td>30/09/2006</td>
</tr>
<tr>
<td>Researcher:</td>
<td>Dr. Kevin Seaton</td>
</tr>
<tr>
<td>Organisation:</td>
<td>Department of Agriculture (WA)</td>
</tr>
<tr>
<td>Phone:</td>
<td>(08) 9368 3244</td>
</tr>
<tr>
<td>Fax:</td>
<td>(08) 9367 2625</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:kseaton@agric.wa.gov.au">kseaton@agric.wa.gov.au</a></td>
</tr>
</tbody>
</table>

**Objectives**

To develop a method for propagating waxflower plants including new hybrids to eliminate root spiralling and consequent root failure following planting out in the field through:

- Determine the characteristics of a propagation tube to prevent root spiralling.
- Changes in nursery practice to better manage tube stock during propagation
- Developing protocols for better management of plants pre planting out
- Developing protocol for field establishment
- Developing information products

**Current Progress**

The occurrence of root spiralling or root knotting has been established, in many cases, as the cause waxflower plant failure. This effect is most apparent towards the end of summer when evaporative demand is high. Laboratory trials testing out waxflower growing in propagation tubes with different configurations have confirmed the frequent occurrence of root spiralling. Several field trials testing the long term performance of plants propagated using different methods are nearing completion. One of these trials includes a large 300 plant field trial planted on a grower’s property. This trial included a range of plant material commercially propagated using different tube designs and conditions. Also a trial using grafted root stocks was planted to determine effect of root stock vigour on subsequent plant growth and root development. Final assessment of these trials will take place this season. Guide lines are being prepared on best practice during propagation, tube stock management following propagation and plant establishment in the field. Field days and demonstrations on “Container and planting techniques for waxflower” at the 2006 Waxflower Conference WADAF have extended the message of the importance of having quality planting stock for successful establishment of waxflower plantations. A farmnote is being prepared on container management of waxflower.