

## Top Wedge Grafting *Eremophilas*®

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### INTRODUCTION

The Australian National Botanic Gardens (ANBG) in Canberra holds the largest collection of Australian plants in Australia, and its goals are to promote the study of and culture of Australian plants. Plant collections are held for a range of purposes including ex situ conservation, education, and display.

Canberra has a temperate climate with a temperature range from -6 °C to 40 °C, making it possible to grow a wide range of Australian plants species.

However, the soil is largely clay, which means that many species in the genus *Eremophila*, which grow naturally in sandy, well drained soils, are more difficult to establish unless grafted on to a suitable rootstock.

The ANBG holds 53 *Eremophila* species, many of which make excellent display plants. The flowers are usually bright and well displayed, often appearing en masse, but there are often one or two flowers on the plants throughout the year. Some, like *E. racemosa*, have the unusual characteristic of having a range of distinct colours as the flowers develop — orange to red to pink — all of which can be present at the same time. The leaf colour and form is often as distinct as the flowers, and there is almost always a strong colour contrast between the foliage and flowers. The nectar in *Eremophila* flowers has a high calorific content, which makes it very attractive to nectar feeding birds. *Eremophilas* come in all forms from ground covers to shrubs to small trees. *Eremophila* plants grow quickly, and while many may persist for 20–30 years, many are often short lived.

### PROPAGATION

Most *eremophilas* can be propagated easily from cuttings, but their roots are susceptible to fungal diseases. When grafted on to a vigorous, disease-resistant rootstock such as *Myoporum* species like *Myoporum insulare* they can be grown successfully in a wide range of soils and situations.

*Eremophilas* often have very hairy leaves, and almost all species are susceptible to attack from the fungus *Botrytis cinerea* in the moist humid situations of the propagation house. The post preparation treatment described in this paper helps overcome the problem of scion rotting in the propagation house.

**Rootstock.** *Myoporum insulare* is very compatible for grafting *eremophilas* and makes an excellent rootstock. It is a large, quick growing shrub which occurs naturally on coastal headlands in South Australia and Victoria. The particular *M. insulare* clone used by staff at the ANBG was originally collected from Port Lincoln in South Australia. It develops long, firm straight stems of varying thickness which are easy to match with the different *Eremophila* species. The stems are easy to handle and manipulate and cut with a razor blade. The rooting percentage is close to 100% within 2–3 weeks during most of the year. Staff prefer to use cutting grafts because the plant material can be collected at the same time, the stems are easier to work with and placing rooted stocks in potting mix in the propagation house attracts fungus gnats.

**Grafting Technique.** Staff at the ANBG generally use top wedge grafts to graft *eremophilas*.

- A piece of stock material approximately 100 mm long is selected, and the lower leaves are removed, leaving three or four on the stem.
- A cut approximately 5–10 mm long is made into the top of the stock.
- The scion material should be semi-firm and the same thickness as the stock so that the cambium layers can be matched.
- The scion should be 60–80 mm long with the same number of leaves as a standard cutting.
- The lower portion of the stem is cut into a wedge shape 5–10 mm long and inserted into the cut in the top of the stock.
- The joint is then completely wrapped with a stretchable tape such as Parafilm® or florist tape. The stem of the completed graft stem is then re-cut and dipped in a suitable rooting hormone.

### POST PREPARATION POLY-TUBE TREATMENT.

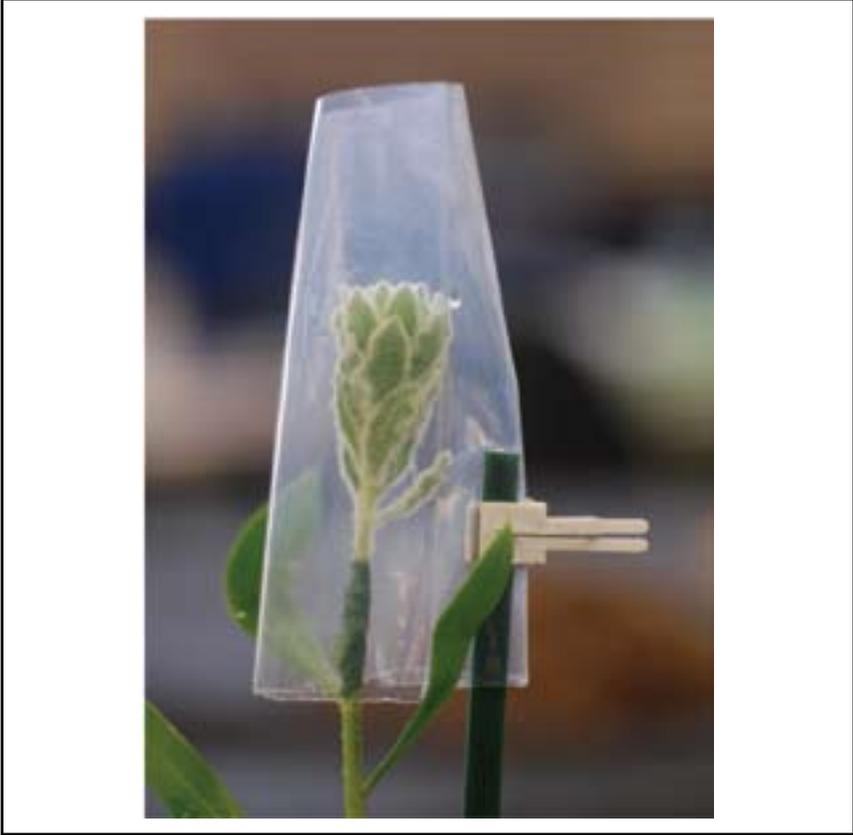
**Background.** Staff at the ANBG nursery has been grafting Australian plants since the mid-1970s with varying success. Emphasis has been largely placed on providing vigorous, disease-resistant rootstocks with cross genera species, for example, using *Westringia* rootstocks for *Prostanthera* species and *Myoporum* rootstocks for *Eremophila* species.

In May 2005, at the I.P.P.S. Australian Region meeting in Mildura, Allen Gilbert presented a paper on grafting apples using a clear plastic tube and later gave away samples. It was with these samples and the subsequent purchase of a 600-m roll that the technique was developed. In the period between Sept. and Dec. 2005, 53 species of *Eremophila* were grafted using the post preparation polytube treatment (Fig. 1).

#### **Description of Process.**

- Prior to sticking in the rooting medium, the graft stem is inserted into a piece of hollow polythene plastic tubing that is 50 mm in diameter and approximately 100 mm long.
- This plastic tube is placed above the leaves of the stock; there should be approximately 15–20 mm of tubing above the top leaves of the scion.
- The graft stem with plastic tube is then inserted in the propagation medium to a depth so that the leaves of the stock are 5–10 mm above the surface of the medium.
- A plastic stake is then inserted down through the tube and into the propagation medium approximately 25 mm from the graft stem.
- A plastic grafting clip is then used to hold the plastic tube to the stake.
- A small amount of water is then sprayed into the top of the tube so that the water runs down the sides.

The purpose of the plastic tubing is to create a separate microclimate for each scion during the period when the graft union is developing in a mist propagation environment. The plastic tubing collects a film of water droplets on its inner surface but the leaves remain largely dry and are less susceptible to *B. cinerea* infection. Care is taken to ensure that the leaves are not in direct contact with the plastic tubing.



**Figure 1.** *Eremophila subfloccosa* grafted on to *Myoporum insulare*. Photo: Joe McAuliffe.

### RESULTS OF USE WITH *EREMOPHILA* SPECIES

Prior to the development of this treatment, the percentage of successful grafts was usually between 20%–50% at best. Results with 30 of the 53 *Eremophila* species were significantly improved in the range of 50%–100% (overall 438 successful grafts from 645 = 68%). The *Eremophila* species in this category are *behriana*, *bignoniiflora* × *polyclada*, *bowmanii* subsp. *bowmanii*, *christophori*, *crassifolia*, *dalryana*, *divaricata* subsp. *divaricata*, *drummondii*, *forrestii* subsp. *forrestii*, *glabra*, *inflata*, *ionantha*, *latrobei* subsp. *latrobei*, *longifolia*, *mackinlayi* subsp. *spathulata*, *maculata* var. *brevifolia*, *maculata*, *microtheca*, *nivea*, *oppositifolia*, *polyclada*, *racemosa*, *resinosa*, *saligna*, *serrulata*, *strongylophylla*, *subfloccosa*, *veneta*, *weldii*, and *youngii*. The results for other species, which have proven difficult to successfully graft in the past, were also improved but not quite as dramatically.

### COMMENTS/DISCUSSION

- In many ways this is a progress report, with work continuing to increase the number of taxa tried using the poly-tube treatment.

- There were up to eight staff working on the grafting program during this period, and with almost one thousand grafts prepared, it is possible that the skill levels of those staff improved significantly and consequently influenced the results.
- Time of year does not seem to have influenced the result, although grafting is usually carried out during the winter and spring rather than summer/autumn when temperatures are hotter and it is more difficult control moisture levels in the propagation houses.
- Although *M. insulare* appears to be compatible with a wide range of *Eremophila* species it cannot be assumed that this is correct. Another rootstock may have to be tried with the difficult-to-graft *Eremophila* species to test this.

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