

Grafting Australian Native Species

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Summary

Eremophila is a diverse genus mostly from the drier regions of inland Australia. This has presented several difficulties for propagators in the southern states with colder and wetter climate. Constructing microclimates is one way to overcome the issues of cultivation, but more success can be achieved if the plant is grafted onto one of two different *Myoporum* species. Similarly, the genus *Prostanthera* also has several species originating in drier, more arid climates and cultivation of these species in colder and wetter climates can also be achieved with grafting onto a more suitable rootstock. The

wider range of *Prostanthera* spp. are only just starting to become more widely known and the scope for cultivation of grafted plants is becoming larger as the less common species are being propagated. This paper introduces *Eremophila* and *Prostanthera* species as well as the rootstock genera of *Myoporum* and *Westringia*. The grafting techniques used, and best matches of rootstock and scion spp. that have been refined over the years, and maintaining grafted plants and their post-grafting best practices for handling are discussed.

INTRODUCTION

The genus *Eremophila* (Scrophulariaceae) is fascinating due to the sheer variety and diversity of species in the genus (Figs. 1, 2, 3). They are a very useful genus, with a

shape, size and flower colour to please nearly everyone. *E. gibbifolia* (Fig. 2) is in my top ten of favourite plants. It is a great plant to capture the interest of new students.

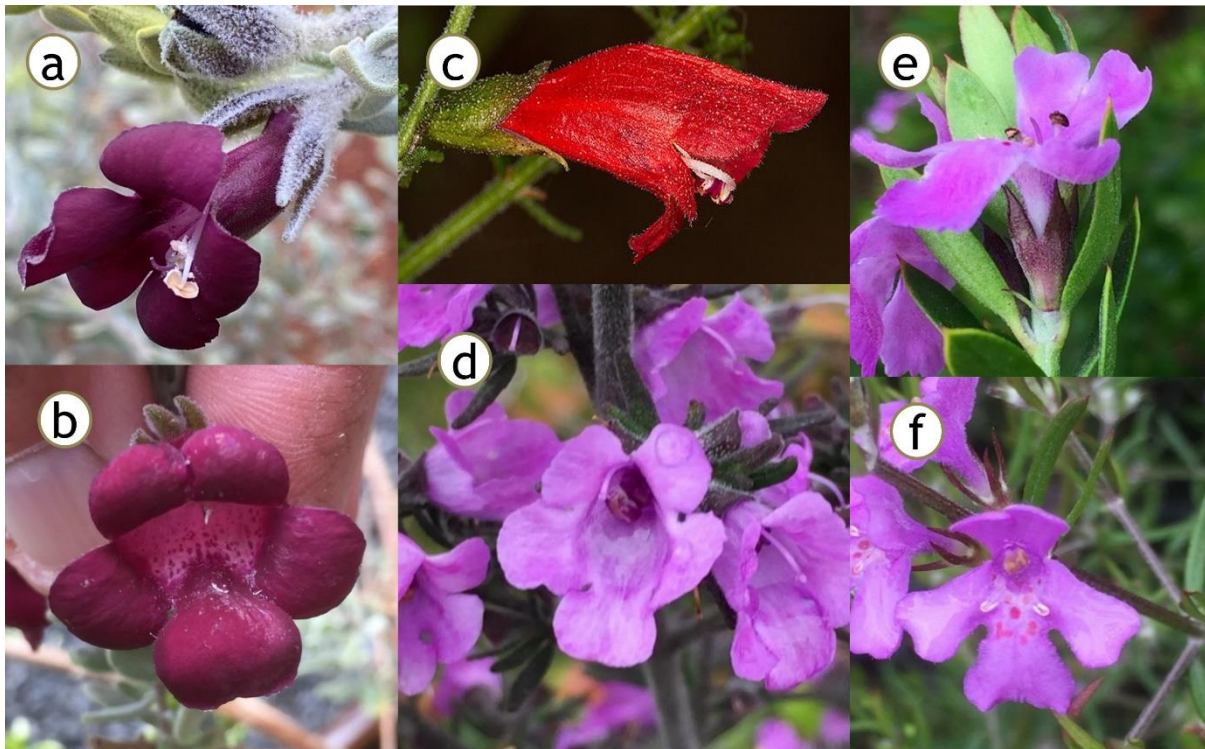


Figure 1. The contrasting flower structure among species used at TAFE, Geelong to teach students the basic principles of identifying plant families, genera and species. In this example, *Eremophila* has five calyx parts and a notch between top petals (a and b), Genus *Prostanthera* has two calyx parts and a gap between two top petals that separates only half-way up (c) and *Westringia* with five calyx parts, but the five petals are fused at the base (d-f).

Prostanthera (Lamiaceae) is another fascinating genus with many Australian natives (Fig. 1). They grow in almost every situation and have a big range of flower colours and leaf textures. Not to mention the amazing range of aromas. *Prostanthera* spp. have that in abundance. *Prostanthera magnifica* has purple flowers that can attract attention in any flower show.



Figure 2. *Eremophila gibbifolia* is among my ten favourite plants. It can attract immediate attention of students in the classroom.

The genus *Westringia* gets a mention here mainly because of its use as rootstocks, but there are a number of species and cultivars that are great additions to any garden. I like using these three to help teach students the need for good observation techniques to tell different species apart (**Fig. 1**).

Grafting For Survival

The main reason we need to graft certain species of both *Eremophila* and *Prostanthera*, is to help them survive the wetter conditions of the winters here in Geelong in particular and southern Victoria and South Australia all the way to Southern New South Wales in general.

All of these plants dislike ‘wet feet’, and the Geelong winters can not only be wet but have constant coastal drizzle, which keeps the foliage damp and eventually leads to rot. While a lot of the species can survive if kept in pots, cultivation on the ground, even in raised beds, needs a bit of assistance. Some of the popular *Eremophila* spp are shown in **Figures 2 and 3**.

Myoporum is the genus to use for grafting *Eremophila*, with *M. insulare* and *M. montanum* being the two most reliable (**Fig. 4**). My personal preference is to use *M. montanum* as the end sizes of both the rootstock and the scion are roughly the same.

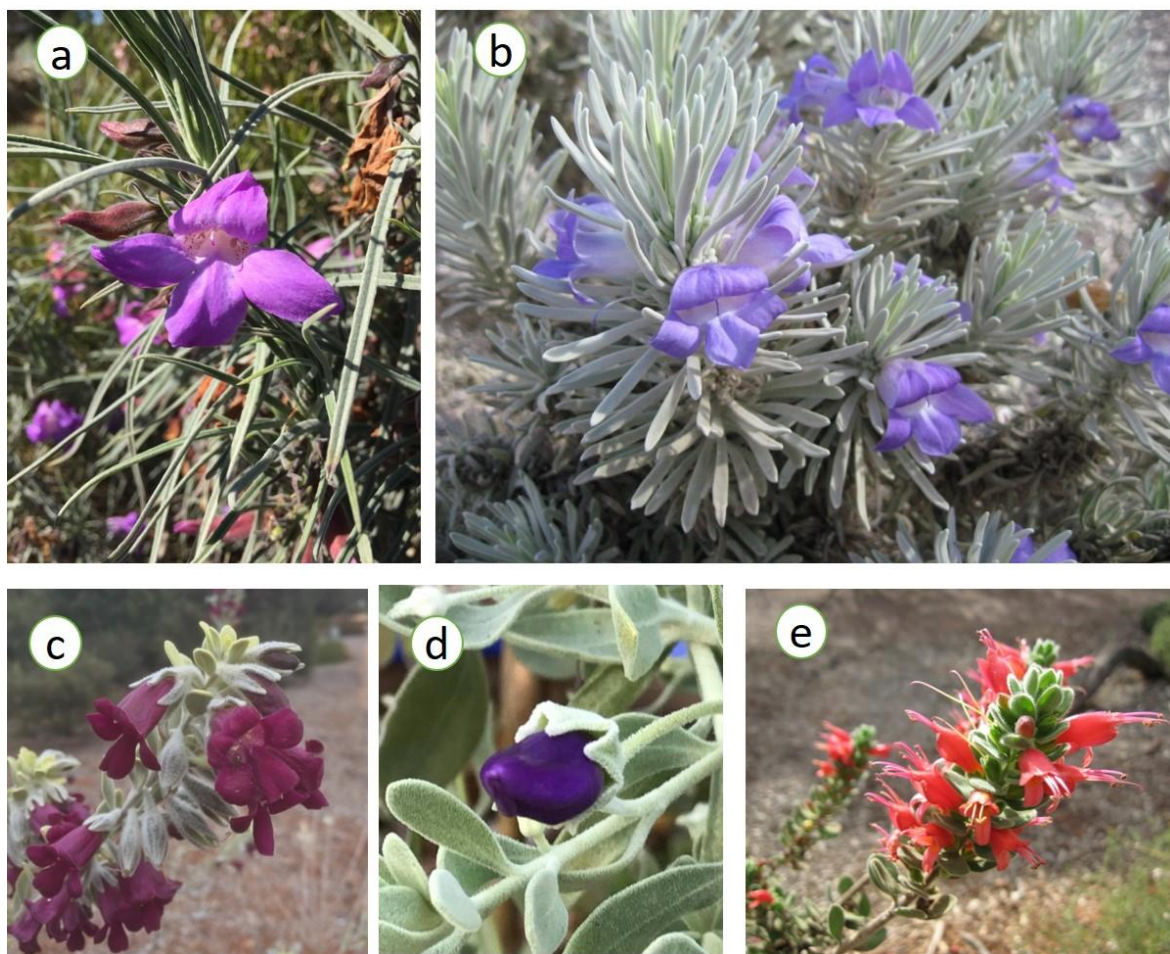


Figure 3. Some of the popular *Eremophila* spp. *E. foliosissima* (a), *E. fasciata* (b), *E. muleriana* (c), *E. macdonellii* (d) and *E. splendens* (e)

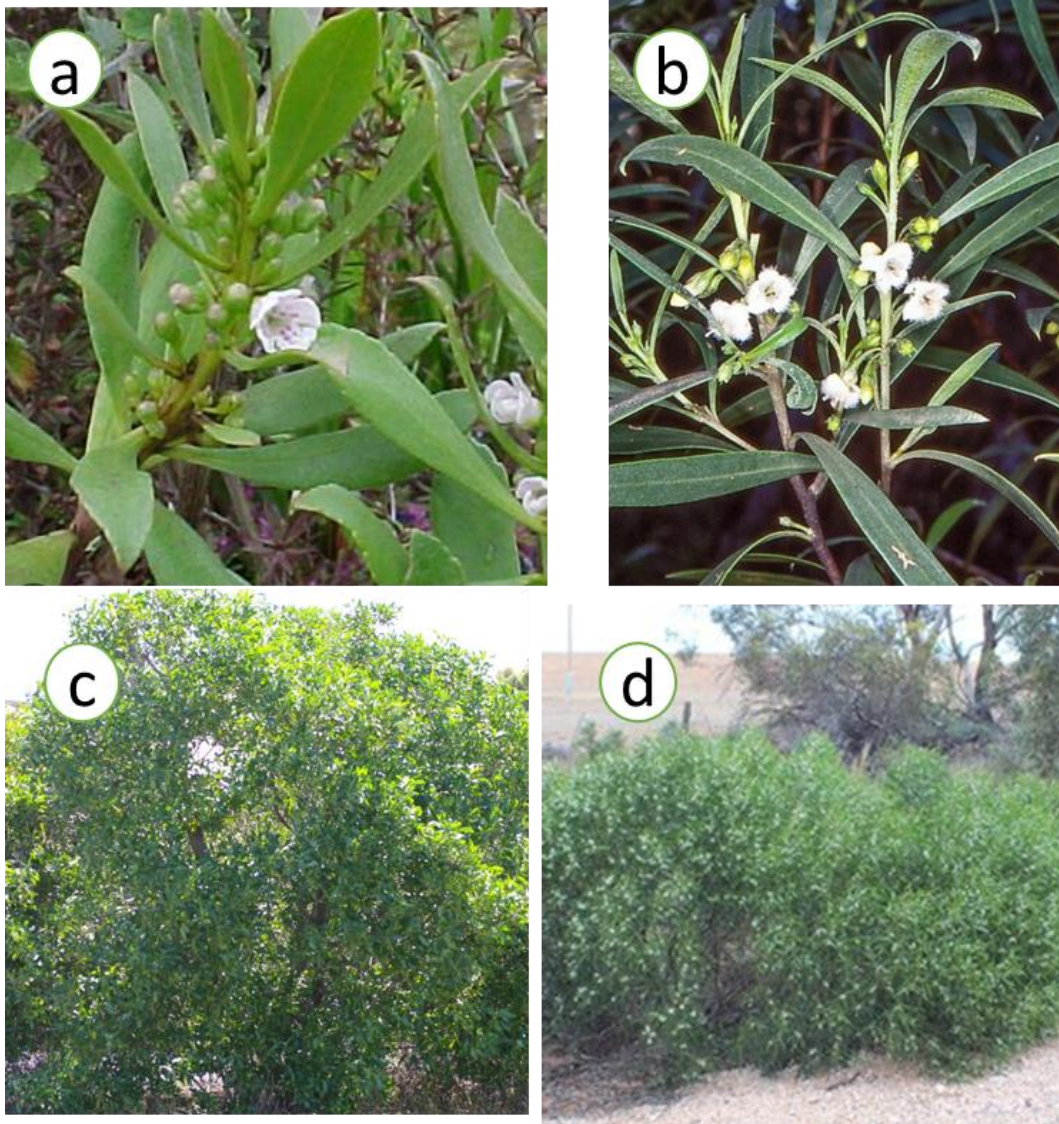


Figure 4. *Myoporum* is used as rootstock for grafting *Eremophila* spp. (a, c) *Myoporum insulare* (b, d) *M. montanum*, the more compatible species in terms of stem size.

For *Prostanthera*, (popular species shown in **Fig. 5**) I have stopped using *Westringia* ‘Wynyabbie Gem’ as a rootstock as it also dies under wet conditions and have swapped to *Prostanthera scutellaroides*, which seems to have a greater tolerance for damp conditions (**Fig. 6**).

Incompatibilities are mostly based around the end sizes of both the rootstock and the scion. **Figure 7** shows the unequal growth, but it hasn’t necessarily meant the end of the plant. These examples have still lived for a number of years, so if you can stand the slightly ugly look, you still get the benefits of a stronger plant.



Figure 5. Some of the popular *Prostanthera* spp. *P. striatifolia* (a), *P. teretifolia* (b), *P. ovalifolia* (c) and *P. calycina* (d). Photo credit Miriam Ford.



Figure 6. The two species used as rootstocks for grafting *Prostanthera* spp. (a) *Prostanthera scutellaroides* (b) *Westringia* 'Wynyabbie Gem'. The former is more tolerant of 'wet feet' and hence preferred for grafting.



Figure 7. Size of scion and rootstock can result in incompatibilities, but some grafted plants survive for long (Photo credit Amanda Shade, Kings Park Botanic Gardens, WA).

Rootstock Preparation, Cleft Graft, Parafilm and Tying the Graft Union and Planting

In the rootstock plant to be used, create a normal sized cutting, but leave 2-3cm above the top leaf for the graft site (**Fig. 8 a-c**). Scions should have a maximum of 3 or 4 nodes, and the leaves should be cut in half to help reduce moisture loss. Cut the bottom of the scion to a wedge to expose the vascular tissues on each side. (**Fig. 8 d-e**). It must be a wedge, not a point. If you cut to a point, you will have removed all the vascular tissues. Thereafter, cut a slit in the middle of the rootstock to 3mm longer than the wedge of the chosen scion. Then gently slide the scion into the wedge until all the exposed tissues are inside the slit.

Parafilm™ is a laboratory tape that has a waxy coating and is used like cling wrap to cover beakers etc. and can be sourced from laboratory suppliers or online marketplaces. Cut a 1cm wide strip of Parafilm from the roll. This one strip will stretch enough for 3 or 4 grafts. Peel the

backing off the strip and hold it between your fingers to warm it up a bit. Then stretch out the first third of the strip to about 3cm. Start by rolling the Parafilm around the very bottom of the slit, go around once and let it stick to itself. Continue up the graft in 5mm increments, keeping a slight tension on the Parafilm.

Working upwards closes the wedge on the scion material, making for good contact of the tissues inside the graft union. Go to at least 5mm above the top of the graft to seal off the wound, and then go back down about halfway before breaking or cutting the Parafilm. Roll the end until it sticks to itself.

The aim is to have the wound nice and tight. This keeps the two lots of vascular systems in contact with each other, hopefully making the healing process quicker. It is also necessary to have the union waterproof, as the presence of water may encourage the wrong types of tissue to form. The stages of establishment of a cleft graft are shown in **Fig. 9**.



Figure 8. Preparation of rootstock (a – c) and scion (d-e) for grafting. Wedge shaped cut in the scion shown in (e).



Figure 9. The stages of making the cleft graft. a) Sliding the wedge of the scion to the slit made in the rootstock, b) Starting the wrapping process with Parafilm from the bottom of the wound and c) complete coverage of the wound with Parafilm, ensuring water repellence and good contact of vascular tissues of the scion and the root stock.

It is important to keep the stems moist while keeping the tops dry. Dip the cutting in hormone and plant in cutting pots. To induce rooting IBA 4000 powder can be used and for planting Perlite and Peat moss mix with a ratio of 4 Perlite to 1 Peat Moss is recommended. Capillary pots can keep the tops of grafts dry, as they are watered from the bottom. Pots used for capillary watering have extra holes on the base of the pot, this enables the media inside the pot to have good contact with the mat underneath, allowing water to move from the mat into the pot via capillary action. The capillary mat is made from a hydrophilic material that holds water and allows it to move up into the pot that is placed on it. The material is usually a synthetic material that will last for a number of years.

Water the grafts making sure not to wet the tops. It is best if the foliage stays dry, so use a small watering top to aim between the cuttings. Small bottle tops are ideal or drill out the lid of a soft drink bottle with 1mm drill bit. Providing increased humidity is important, but it is also necessary to keep the foliage dry. Various types of domes are available for this purpose.

Managing the Grafted Plants

It is common practice to have small plastic bags over the grafts of Grevilleas, but the furry foliage of *Eremophila* makes this problematic. This type of foliage has the potential to rot when kept wet by the contact with the plastic. Any growth from the

CONCLUSION

Grafting *Eremophila* and *Prostanthera* onto rootstock that are more adapted to the wetter conditions of Geelong and similar

environments allows higher survival and better growth of the plants on soil. rootstock should be removed, but the original leaves from your cutting should be left behind. These leaves continue to supply energy to the scion and should not be removed until the top growth is the size of a tennis ball. Watch out for shoots off the side of the slit used to form your graft, these must be removed straight away and can be cut flush with the stem. Perlite attached to the roots can be left at the time of potting. Potting the grafts is similar to a normal cutting; one must be careful not to handle the top of the graft so as not to stress the new union. Leave the Parafilm on, it will fall off itself later. Use 60mm tubes or 75mm. An *Eremophila* graft ready for transplanting is shown in **Fig. 10**.



Figure 10. Grafted *Eremophila* ready for planting out.

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