Grafting Australian Native Plants — 30 Years of Progress©

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INTRODUCTION

In the mid 1970s, the renowned botanist/horticulturalist David L. Jones introduced me to the concept of grafting native trees. Around this time, David successfully grafted the phytophthora sensitive *Hakea francisiana* onto the hardy eastern Australian rootstock *H. salicifolia* (Beardsell et al., 1982). Also around this time Ron Barrow and Bill Molyneux of Australflora Nursery, grafted a selection of red flowering gum, *Corymbia ficifolia* (syn. *Eucalyptus ficifolia*) onto *C. maculata* (syn. *E. maculata*), *C. calophylla* (syn. *E. calophylla*), and *C. gummifera* (syn. *E. gummifera*).

A number of other successful grafting programs were completed from the late 1970s onwards. These included grafting several hard-to-grow plants onto more hardy rootstocks, e.g., arid zone *Eremophila* sp. grafted onto *Myoporum* sp. and *Prostanthera* sp. onto *Westringia fruticosa* by the Australian National Botanic Gardens (Dawson, 1996), and Stirling Range *Darwinia* sp. onto *D. citriodora* by Doug McKenzie in Victoria (McKenzie, 1996). Dawson (1996) provides an excellent review of much of the earlier work on grafting Australian plants. Merv Hodge in Queensland also did pioneering work on grafting of *Grevillea* and other genera. Ray Kerr, David Myers, Annette Hallpike, and myself at the then Horticultural Research Institute did grafting experiments with a wide range of native plants in the early 1980s. Although the success rates were often low, we did establish grafted plants of *Allocasuarina torulosa* clones, *Thryptomene calycina* (onto *T. saxicola*), *Tristaniopsis laurina*, *C. ficifolia*, *Banksia canei*, *G. barklayana, Lophostemon confertus*, *Eucalyptus sideroxylon* (variegated clone), *Brachychiton* sp. and *H. francisiana* (Beardsell et al., 1982; Meyers et al., 1993; Meyers, 1993).

Much of the success in grafting Australian plants has been the suitability of hardy eastern members of genera, which can be used as rootstocks for related difficult-to-grow species from Western Australia and elsewhere. However there has also been a need to develop grafting methods for species, which cannot be propagated by cuttings. There are many recognised outstanding specimens of *Eucalyptus*, *Corymbia*, *Angophora*, and *Lophostemon confertus* in this category. Consequently from 1993–1996, Michelle Bankier and I at the Institute for Horticultural Development did grafting trials with a range of *Eucalyptus* sp., *C. citriodora,* and *A. costata.* Grafting success was further improved on most species, however commercial success rates were not achieved. In addition, we were unable to successfully graft an outstanding clone of *A. costata*. In 1998, Fon Ryan successfully grafted this species (Ryan et al., 2000).

Between 1997 and 2003, I continued trials using completely new methods of rootstock and scion manipulation, and achieved 100% success rate on *E. leucoxylon* subsp. *megalocarpa, E. melliodor*, *E. sideroxylon,* and weeping standard trees of *B. integrifolia.* Most previous grafting programs on Australian plants centred on cleft or wedge grafts, which is a crude method. I believe that many of the poor graft unions observed in earlier work were due to the poor matching of cleft grafts.

COMPACT GRAFTED TREES

An unforeseen benefit of grafting Australian trees has been consistently observed compact growth. In some cases, this has been due to rootstock effects. For example, *C. maculata*, which forms compatible graft unions with *C. ficifolia* clones, appears to reduce height and vigour by approximately half compared to *C. calophylla* rootstocks.

Similarly self-pollinated seedling rootstocks of *E. leucoxylon* subspecies *megalocarpa* dwarf the parent clone. Grafting per se onto outcrossed seedling rootstocks at least in *C. citriodora* also appears to reduce vigorous extension growth, which is characteristic of the juvenile phase in this species, and also increases the angle between lateral branches and the main stem which may lead to structurally sounder trees. Early flowering is also a feature of grafted trees such as *C. ficifolia* and *E. leucoxylon* clones.

There are a large number of successfully grafted plants of a wide range of Australian trees and shrubs now known to be greater than 20 years of age. These include selections of *C. ficifolia*, *Lophostemon confertus*, *B. canei*, and *H. francisiana*. Earlier rumours of long-term graft incompatibility in Australian plants seem unfounded as long as rootstocks are closely related to scions. While much more work is to be done, especially on different scion/rootstock combinations to alter size and vigour, we are on the verge of a revolution in Australian landscapes using clonally propagated elite native trees, and the unpredictable and unacceptable seedling variation will become a thing of the past (Beardsell et al., 1993; 1994).

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