

## Propagation of Xerophytic Plants

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### INTRODUCTION

The nursery and landscaping industries are always looking for new and exciting plant species. There is great economic potential in relatively unknown Australian plants from which these industries could benefit. In my opinion native Australian plants have not been explored to their full potential.

I am in charge of the permanent pot collection at the Australian National Botanic Gardens. It comprises Australian native plants that are either difficult to grow in cultivation or have a conservation status. While these plants have proven difficult to grow in Canberra's heavy clay soils, they perform very well when containerised. The plants in the collection represent different ecological areas from within Australia, which include plants from temperate to arid environments. The plants in this collection are genetically identical to wild or naturally occurring plant populations.

In total the collection holds 378 different taxa. Included in the collection are small trees, shrubs, groundcovers, herbaceous perennials, tufted perennials, perennial herbs, bulbs, grasses, and semi-parasitic plants.

### PLANTS WITH HORTICULTURAL POTENTIAL

Many of the plants grown have spectacular characteristics which ensure their horticultural potential. The work program at the nursery allows for experimentation and trials to be conducted by the staff. The results of these activities may be of benefit to the horticultural industry, including the cut flower sector. Arid plants make up approximately one third of the collection which I maintain. I believe these plants in particular have enormous potential as they adapt to a variety of conditions and would make good feature specimens for low maintenance and rock gardens.

For example, *Haemodorum coccineum* or blood root is found growing in Queensland, the Northern Territory, and Western Australia, it is easily propagated by division of the rootstock or from seed. This plant requires a low level of maintenance, but would make a spectacular cut specimen because of its intense scarlet flowers on a 70-cm stem.

### XEROPHYTIC PLANT USE

With the current concern for water conservation, it is necessary to reconsider the type of plants grown and the type of landscape to use. In many areas of Australia dry periods can last for several months. In these areas local species or species of an arid or semi-arid origin are severely under-utilised. Plants that can tolerate low water conditions must also be able to adapt to changes in climate, root environment, and soil pH as well as many other factors affecting growth. For the Australian National Botanic Gardens this becomes relevant with the planned arid

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plant display. Termed xeriscaping, this is an exciting and new form of horticulture that will play a large role in the gardens of the future.

## PROPAGATION TECHNIQUES

The single most important factor in maintaining a healthy and aesthetic collection of containerised plants is propagation. Regular propagation, every 3 to 5 years depending on the species, maintains healthy and vigorous plants which have greater pest and disease resistance, better flower production, and improved strike rate when propagated.

When such a diverse collection of plants is to be maintained a wide range of propagation methods and techniques must be used.

## CUTTINGS

The most common method of propagation used on the collection is cuttings. The type of cuttings, hardwood, semi-hardwood, or softwood, vary between different species and the time of year that cuttings are taken. The preferred cutting type is softwood, though many species will respond better with semi-hardwood cuttings.

The cuttings are usually no more than 150 mm in length according to the species and amount of material available. Sterile conditions are maintained in all working areas and propagation instruments are treated with a chlorine-based sterilising agent prior to the commencement of propagation.

**Hormonal Treatments.** Various hormone treatments are used and these are discussed in a paper previously given by Carmen (1993).

**Other Treatments.** Other treatments or variable treatments exist for propagation. These include the use of fogging, mist, no or low humidity, and plastic-bag treatments. The use of these varies with plant species, e.g., plastic-bag treatments for difficult-to-propagate plants with tomentose foliage.

**Propagation Mix.** The propagation media is sterile and is comprised of 5 perlite : 1 peat (v/v). The high air-filled porosity of 35% and its good water holding capacity prove to be a suitable combination for the fog conditions.

## DIVISION

Division is an essential form of propagation used on the collection. Special considerations including time of year, type of plant, bottom heat, and pruning techniques all play important roles in the success of this method. The collection is highly diverse, many plants are easy to divide, e.g., *Mimulus prostratus*, while others like *Boyra nitida* require special attention to all the above factors and more, including careful monitoring and application of water.

## GRAFTING

Grafting is a useful technique for those plants that are difficult to propagate, e.g., *Grevillea plurijera*, or plants which are susceptible to root diseases, e.g., *Prostanthera* sp. An example where grafting has been used successfully on a difficult species is with *Eremophila* sp. using *Myoporum insulare* as the root stock. The success of this is largely due to the nature of the stock, which produces copious amounts of callus tissue in a short period of time. Another reason for grafting plants in this situation is size control or dwarfing. Many plants are too vigorous to be maintained in a pot

for a long period of time, they either become pot bound or regularly blow over in the wind due to being top-heavy.

### **CLONAL MATERIAL**

All of the above methods of propagation produce plants with an identical genetic make-up to the stock plant. This is desirable as it ensures the continuation and purity of the species from the wild population.

### **CONCLUSION**

The large number of different taxa from all over Australia make the collection very interesting and challenging to work with. I enjoy the responsibility of being in charge of such a collection as it gives the opportunity to use a wide variety of propagation techniques and to develop protocols for particular plant species.

### **LITERATURE CITED**

**Carmen, P.** 1993. The propagation of Australian native plants from cuttings at the Australian National Botanic Gardens (ANBG). *Comb. Proc. Intl. Plant Prop. Soc.* 43:60-63.