Amelanchier lamarckii 'Ballerina'
Rhododendron (*Azalea*) (*viscosa*-hybrid) 'Jolie Madame'
Buddleia davidii 'Nanho Blue'
Caragana arborescens 'Walker'
Cercis canadensis 'Forest Pansy'
Cornus nuttallii 'Monarch'
C. nuttallii 'Ascona'
Clematis tangutica 'Aureolin'
Cotoneaster (*dammeri* hybrid) 'Eichholz'
Cedrus deodara 'Golden Horizon'
Elaeagnus pungens 'Goldrim'
Genista pilosa 'Goldilocks'
G. tinctoria 'Golden Plate'
Hamamelis intermedia 'Diane'
Hedera colchica 'Sulpher Heart'
Hydrangea arborescens 'Annabelle'
Magnolia 'Susan'
Mahonia aquifolium 'Smaragd'
Malus 'Red Sentinel'
Pieris japonica 'Debutante'
P. japonica 'Red Mill'
Populus balsamifera (Syn.: *P. candicans*) 'Aurora'
Potentilla fruticosa 'Red Ace'
P. fruticosa 'Royal Flush'
P. fruticosa 'Goldstar'
Spiraea japonica 'Shirobana'
S. nipponica 'June Bride'
Ulmus elegantissima 'Jacq. Hillier'
Viburnum plicatum 'Cascade'
Wisteria floribunda 'Issai Perfect'
Dicentra 'Luxuriant'
Hosta 'Royal Standard'
H. sieboldiana 'Frances Williams'

GROWING CERTAIN AUSTRALIAN NATIVE SHRUBS AND TREES FROM SOFTWOOD CUTTINGS

EDWARD J. BUNKER

Redlands Greenhouses
Redland Bay, Queensland, Australia

All of us know that many plants in our gardens are hard to propagate, and yet are very desirable. Amongst this group of plants are many of the Australian native shrubs. Selections of our Australian native plants have been made by enthusiasts and nurserymen and some hybridization has been carried out. Also some hybridization has happened in gardens. Many of these plants in flower are very spectacular but many of them are very hard to propagate in commercial quantities.

This paper is aimed mainly at rooting cuttings in the genera *Grevillea*, *Melaleuca*, *Callistemon* and *Leptospermum*, but I will finish with one or two observations and thoughts on micro cuttings of some foliage plants.

Of course it goes without saying that without the right cutting wood from parent stock, one has very little chance of getting good results. In work carried out in our nursery over the last ten years, we have developed some techniques in managing stock plants and getting very good results in the rooting of plants in these genera. However, we still have some exceptions in very hard-to-root cultivars.

It is essential to use juvenile cuttings and juvenility needs to be induced and maintained in stock plants to have any

success at all. We currently have planted out, in stock areas, many of the cultivars we are using. We maintain about two acres of these now. We find that we have to prune them regularly on about a four-month rotation to get the cuttings we require. The stock bushes are allowed to grow to a reasonably mature stage initially, during which time we take cuttings whenever required. When the bushes begin to harden off we prune severely, cutting the plant back to about ⅓ of its original size.

In the genus *Grevillea* and, in particular, the three cultivars — 'Sandra Gordon', 'Robyn Gordon' and 'Misty Pink', we find that we have plants that won't stop flowering. With 'Robyn Gordon' and 'Misty Pink', there are masses of flower buds produced on each and every terminal. 'Sandra Gordon', in winter — from the end of April till the middle of October (in Australia), does nothing but flower on every growth. With 'Sandra Gordon' we find it easier to do all of our propagation in the warmer months and, in particular, just prior to flowering. The rooting results we have with 'Sandra Gordon' vary from around about 40 to 80 percent. In propagating 'Misty Pink' and 'Robyn Gordon', we are getting close to all cuttings planted growing on.

We like to replant our stock plants every three years, and we keep them pruned so that every fourth month the bush is pruned back severely. In between we go through on a monthly basis and remove all buds. *Grevillea* 'Misty Pink' is grown from short cuttings about three inches in length from very soft material. The bush itself grows to about eight feet and we shorten it back in our major prunings by about half; some of the branches being cut are as thick as a broom handle. Depending on the time of year, about six weeks after pruning, cuttings are ready to take and from a mature bush we can harvest about fifty cuttings every two to three weeks.

In the stock area we maintain very low fertility and spray regularly for mites and leaf spot (*Verucisporum proteacarum*). Spraying is done on a monthly basis with a regular spraying schedule.

I would now like to go into more detail with one cultivar that we have perfected. *Grevillea* 'Robyn Gordon' is one of the more desirable of the cultivars available in the genus *Grevillea*. It grows in most areas of Australia very well and flowers all the year round. It is a sterile hybrid; the only way to make more plants is by cuttings. Plants flower at a very early age, and we have to remove these flowers in the first instance as soon as they are large enough to handle. We do this by going through manually with a pair of secateurs, and taking them off

just above the growing eyes. Cuttings shoot away very quickly, some of them flowering but most being vegetative shoots only.

We take the cutting about four inches long, and we always make sure we take these in the first hours of the morning before the heat of the day. Once we have collected a hundred cuttings, we drop them into a drum containing two gallons of water, into which we have put half a cup of refined sugar. The cuttings are placed in the solution while the propagating staff collects another hundred cuttings — this is for probably about five minutes. The cuttings are turned over when they are placed in the solution, so that they all get nicely wet. When the propagating staff comes back with the next hundred cuttings, they remove the ones that have been soaking and wrap them in clean newspaper, making sure that plenty of moisture is enclosed with the cuttings. The cuttings are arranged on the paper so that they are not bent when they are wrapped up; they are then wrapped fairly firmly into a parcel, and excess moisture is drained out of the bundle from one end. They are then placed in a large box until the next stage.

Once all the cuttings are taken, the staff then takes them to the workroom and unwraps the bundles and trims the cuttings. The tips are taken off, and the leaves are shortened back considerably, so that only about ⅓ of the leaf area is left. We cut all the cuttings between the nodes, not at a node; nodal cuttings tend to over-callus. These cuttings are then rewrapped in the same paper, as it is by now very moist and impregnated with the sugar solution.

It has been fairly widely known in Australia for many years, that a sugar solution to dip these very immature, soft cuttings in, makes a tremendous difference in the way they maintain on the mist benches. We think that the cuttings absorb some of the solution through their leaves, and it tends to make them more turgid, and they stand up much better. We are so confident of this theory that we use it on all of our native plant material that has to be grown from such young immature tip growth and, through tests we have carried out, I would say that it makes a difference of about 25% in our results.

The cuttings are planted in trays of perlite and peat, a 50-50 mixture, the only addition being 1 kg of dolomite (magnesium carbonate) to each cubic yard. Cuttings are dipped in a 1 to 2 second dip of 4 grams per litre of indole-3-butyric acid and water, and then planted in individual pots. Heated benches are then used on which to place the cuttings. Bottom heat is held between 70° and 80° F, with a thermostat control. The cuttings are kept on these benches, under mist, for about two

weeks. The mist is controlled by a balance-arm or a time clock; each way seems to be good, as far as we have found out.

We find that cuttings are rooted and off the bench in about 2 to 3 weeks, and again it depends on the time of the year — winter taking requires a little longer. We have found most *Grevillea* cuttings callus quite quickly — in 7 to 10 days — but, if the cutting material is not right, or they are kept too wet, or the light is not just right, they will continue to callus until the cutting pot is full of callus, but the cuttings won't root. However, if everything is right and the plants are removed from the heat and mist the moment small roots begin to appear, they will continue to root and there are sufficient roots to make the plant grow into a viable and desirable sale item.

Calistemon and *Melaleuca* are much easier to get on with. Very, very tiny cuttings are still used, and treated in the same way, but they root much better, and easier.

I mentioned earlier that I would briefly go into some results of work being done on very young foliage plants, immediately after they have been established in the nursery media, after being taken from tissue culture jars. Quite a number of trees have been handled this way; the example that I will take is *Ficus lyrata*, but the same system applies to numerous others. When these are taken from tissue culture jars they are fortunate if they are ½" long. Once they are established and growing away in the potting medium, with a nice little tip on them, we can take these tiny cuttings from the small plant, and roots will develop very, very quickly. The original plant shoots away again, and often they will break with two or three heads. Those cuttings can again be removed, and they root as well. *Ficus lyrata* has been a difficult plant to handle in volume from large cutting material, taken from trees or container stock, but in this way many thousands of them can be built up in a comparatively short space of time, and grown on to very nice plants. In all cases where we have tried taking these micro cuttings from plants originating as tissue-cultured material, we have had very good success. We wonder whether by research in this field many of the difficult to grow plants in the nursery industry may not be able to be handled more easily in large volumes.

While many of the details mentioned in this paper are basic, I feel that many practicing propagators have very little knowledge or idea on how to maintain stock beds, and it is about time we made sure that this section of nursery practice came fully under the control of our propagators. For best results, it is imperative. Putting it into practice is not so easy.