

Personal Experiences of Grafting High Value Plants[©]

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There are many plants grown in the nursery trade for which modern propagation techniques by cuttings or micropropagation have not proved successful or economically viable. Grafting, although an expensive procedure, remains the most effective propagation method for these plants. Today there is a dearth of skilled propagators willing or able to graft and the technique is becoming confined to fewer nurseries than in the past. This paper describes the ethos and procedures used by the author in the production of grafted plants.

INTRODUCTION

Plants propagated by grafting are generally of higher value than cutting raised plants. They are however also more expensive to produce so profit levels are by no means necessarily higher. It is important to not only obtain high levels of take but also good grade-outs of saleable plants. The cost of failures has to be borne by the saleable plants, so if failures are too high then no profit is made. To succeed, one needs to have a love of grafting, a belief in one's ability, a dogged determination, and an ability to learn quickly by experience.

When I started my nursery I was fortunate to obtain a contract to grow one-year-old grafted trees in 1-L deep pots. So initially pot size was determined, they fitted into Dutch crates perfectly and I was able to obtain 2,000 of these crates second-hand at a good price so the handling system was determined.

I went for straight sided 4-m polytunnels as it would be possible to clad these on my own in perfect weather conditions if necessary. My previous experience in many different grafting situations enabled me to develop a system that suited me, the work load I had, and the fact I was not employing any help. I am gradually moving more production to 3-L product where you can add more value to the plants.

FACILITIES AND EQUIPMENT AT WITCH HAZEL NURSERY

The nursery has a container area of 900 m² which includes four 20×4 m (65×13 ft) tunnels clad with polythene; two 18×4 m tunnels clad with shade netting; and an outside container area 20×10 m with ground cover fabric. There is 2.8 ha of land devoted to stock plants and plant collections.

A simple handling system is used based on Dutch black plastic crates, both shallow and deep. Container sizes are selected that will fit precisely and comfortably in the crates:

- 9 cm square, 24 per tray.
- 9 cm square deep, 24 per tray.
- 1 L round deep, 15 per tray.
- 3 L, six per tray.
- 4 L deep, six per tray.
- 10 L, two per tray.

Other tools and materials used in grafting include a thermostatically controlled wax heater, secateurs, a grafting knife, 200 × 6 mm grafting strips, 150-gauge milky propagation polythene, and co-extruded white polythene bags.

PLANT MATERIAL

Scions

Two sources are used, my own stock plants and customers' growing crop. Whichever source, the material needs to be true to type, well-grown, of good girth, and healthy. I

collect graftwood in late December and place in co-extruded bags and store on a concrete floor in a cold barn, where it will keep in good condition for 2 months.

Rootstocks

The few subjects that are either expensive, not regularly available, or are unavailable are raised from seed on the nursery but the majority are bought in. It is important to have a good relationship with your rootstock supplier, with a mutual understanding of requirements as to stem girth and age of seedling. For example, a 1-year seedling of *Betula pendula* with 4 to 6 mm (5/32 to 15/64 in.) girth potted into a 1-L deep round pot will produce, a well established 6 to 8-mm (15/64 in. to 5/16 in.) stock for grafting by the following winter; but with *Hamamelis virginiana* in the same size container a 2-year seedling of 6 to 8-mm girth will be required to produce a well established rootstock, without much increase in girth, to graft the following summer.

TYPE OF GRAFT

I only use one type of graft, an apical whip graft, whether winter or summer grafting. The advantages of this graft are:

- No subsequent heading back of the rootstock is required.
- It forms a stronger cambial union, with callus formation over the cut on the rootstock.
- It is quicker and easier to carry out than side grafts.

The only disadvantage is that if the graft fails there are no further opportunities to use the rootstock for grafting again.

WINTER GRAFTING

I try to graft as many of the 25 genera I produce in the winter. I find I have more time then, with much less distraction from other nursery tasks. The completed grafts are dipped in molten paraffin wax, placed in shallow crates and stood on the floor in a polytunnel. The aim is for a slow take of the union at an ambient air temperature maintained at around 3 to 4°C (5.4°F to 7.2°F) higher than outside temperatures. When outside temperatures reach 10°C (50°F), I will ventilate the tunnel. Using this method the grafts do not break into growth much more than 2 or 3 weeks earlier than they would outside. I call this method "cold callusing."

At the time of grafting the rootstock medium should be just moist, application of water is carried out with great care until the grafts have made 20 to 30 cm of growth, after which water can be applied more liberally.

SUMMER GRAFTING

I only cut sufficient material first thing in the morning for that day's grafting. Material is kept moist in co-extruded bags in a cool place. Unlike winter grafting, the rootstocks are well watered before grafting. Scions that have large leaves are reduced in size. Completed grafts are placed in deep crates and stood down on the floor in a polytunnel. Milky polythene of 150 gauge is draped over the crates and tucked under the crates on all sides to ensure a near air tight seal. It can be quite hot and sunny during August and early September so a second layer of milky polythene is placed over the grafts which can easily be removed in dull weather. Polythene is completely removed in October. I only check on the grafts occasionally, finding it better to keep them tightly sealed.

GROWING ON

Timely desuckering should be carried out, ideally when shoots can be rubbed out rather than having to use secateurs to cut them. With the tree grafts, a 90-cm (35.4 in.) split cane is placed as close to the base of the rootstock as possible and growth tied in to the cane when it is about 20 cm (7.9 in.) long. With shrubs, scion growth is pinched to encourage a bushy plant.