

These counts were taken in June and are total counts so losses due to low spots, poor soil drainage, poor planting technique, mechanical damage, etc. are all included in the totals.

A completed apple graft costs approximately 16¢ ready for planting. Of this less than 2¢ is labor for making the graft, thus labor used for grafting represents only 12% of the cost of the finished graft. With such differences between stands, the need for more total grafts to be made, extra planting costs, extra land costs and all the subsequent following costs, we don't feel the machine grafting approach holds promise at this time. We will try again and continue our tests but it will continue to be a very modest test program for us.

BEN DAVIS: Jim we ran a test much as you did. We made about 25,000 grafts and the trees are being harvested this fall. We got about a 25% take with the Omega grafter and 90-95% take with hand grafting. As you indicate, the grafts cost about 16¢ but with those losses we don't feel we can afford the machine grafting.

## **POLY TENT VERSUS OPEN BENCH GRAFTING**

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Grafting of various types of ornamentals has been a practice of propagators for hundreds of years. The types of graft and how they are handled has differed according to the personal preference of the propagator for whatever his reasons.

Considering that we all know the basics of grafting I would like to talk about how, with the use of plastic, we can improve our percentage of success and at the same time lower the time and effort it takes to care for the grafts once they are placed in the grafting bench.

The practice most commonly used by propagators is the open bench and sweat box type of grafting. Whether or not you cover your bench, getting the peat moss at the right moisture content, covering the union on the graft, syringing, draining the glass, rolling back the paper, all these can be eliminated by using the poly tent method.

The poly tent method involves building a frame of wood or wire over the grafting bench. The height and the length of the tent depends on what you graft and how many. A desirable

height is 30 inches above the bench. This will give ample room to reach in and stand the grafts up.

You can also put grafts in a flat and then completely cover the flat with poly. This is a good method to use when space is limited because the flats can be put anywhere in the house where there is room.

When top grafting larger plants another method is to put an inflated poly bag over each graft with a ball of wet sphagnum moss below the union. Seal the poly bag below the moss and put the plants anywhere on the floor where there is room.

One big advantage of grafting in poly tents is that you can double and triple stack the pots in the bench, in the flat or on the floor. This way you can get 2 to 3 times as many grafts in the same amount of bench space as when using the open bench or sweat box method. If you double or tripple stack the pots remember you must have space in some greenhouse to space out the grafts once they are removed from the tent. No wax is used on the unions at any time.

Once the frame is constructed, about 3 inches of wet peat moss is put in the bench, plastic is put over the frame and sealed air tight on three sides leaving the fourth side open until all the grafts are in the tent. The grafts are just stood upright on the peat moss. No covering of the union is used.

When the tent is full it is sealed air tight and no additional care is needed for the next 3 to 4 weeks. Clear plastic (4 or 6 mil) is used so that you can see into the tent and observe what is going on at all times without opening it.

Two points of caution: One — the frame should be constructed in an oval or if you use a rectangular frame the top should be of "A" frame construction. This will allow the moisture-droplets that form to run off the sides into the peat and not on the grafts. Second — grafted woody deciduous plants should be kept separate from the evergreen and conifer grafts because the makeup time may differ. Evergreen conifers and broadleaf grafts are removed from the tent once the callus at the base of the scion is full (usually 4 weeks). Woody deciduous plants are removed from the tent when the leaf bud has broken and the leaf is showing about 1/4 inch long. This is very important. If the deciduous grafts are not aired at this time the leaves will "cook" and your scions will die. They must be aired at this time regardless of size of the scion callus. I have never experienced a situation where the scion was not callused enough to sustain the life of the plant when the leaf was this far advanced and the graft aired.

When the grafts have callused the poly at the base of the tent is loosened to allow air to enter the tent. It is kept loose for

3 days after which time you can remove the grafts from the tent or you can remove the plastic covering the grafts; either way the grafts must now be spaced out slightly. The grafts are now given the normal care that you would give any other plant growing in your greenhouse.

CHARLES McCLOUD: What are your temperature ranges during the various grafting operations?

LENNY SAVELLA: The understocks are brought in from a holding house which usually ranges from 45 to 50°F and when they are grafted they go into the grafting house at a temperature of 76°F and we try to hold this temperature.

CHARLES McCLOUD: What about the temperatures in your tent, on a bright sunny day does the temperature go way up?

LENNY SAVELLA: Yes it may. I forgot to mention this in my talk, but on a bright sunny day it is very important that you put some kind of shading over the top of your tent.

JOE CESARINI: Can you graft lower and cover the union with the peatmoss in the poly tent?

LENNY SAVELLA: No, you can't do that Joe. What I'm trying to do is design a system which requires the least amount of labor, care and attention possible. This method is 100% fool-proof. I make the union, stand it up in the tent, the union doesn't have to be covered or waxed and this considerably reduces labor.

## **DWARF ROOTSTOCKS — PROPAGATION AND USAGE**

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Rootstocks, especially for fruit crops, is an old subject with renewed interest. For example, 25 years ago there was very little interest in dwarf apple trees compared to current use of up to 90 percent in commercial orchards. There are practical reasons for this, such as: smaller trees are easier to manage, production per unit of land is higher than the old system, fruit quality is improved and management costs are less. This report is an update on rootstocks and their application for controlling tree size and for increased yields.