

you use is quite important; in fact, we use two, one for summer and one for fall budding.

HUGH STEVENSON: Mr. Howard's buds all seem to be completely covered but some of those that you showed were not covered; do you cover your buds?

AL BREMER: We cover the apples but we don't cover the cherries; if you put tension on the cherry buds it destroys them.

## MANUAL GRAFTING VERSUS MACHINE GRAFTING

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Machine grafting has been with us for a long time. From a historical standpoint, M.G. Kains in his book, "Plant Propagation", refers to machine grafting techniques; this book was written in 1916. Robert Garner refers to grafting machines in his classic text, "The Grafter's Handbook". He probably puts his finger on the situation today when he states "grafting machines are more commonly used for vines than for other subjects". He then goes on to state why. Hartmann and Kester also treat the subject in their book, "Plant Propagation: Principles and Practices."

Over a period of time our company has tried a number of grafting machines. The latest one we have tried is the Wahler Graft-Star unit, making what is popularly referred to as the Omega graft. With this unit we were able to produce 5500 grafts in an 8 hour day with a skilled operator. Using an unskilled operator a production level of 3300 grafts per day was reached. This would compare with a 1600-1800 average that we would expect to have made per 8 hour day by a skilled grafter. These grafts were wrapped in the usual manner and placed in grafting boxes for callusing.

We noticed that a browning or oxidation of the machine-cut cambium tissue takes place rather rapidly using this system. My personal feeling is this later reflects on the type of graft stands we secured using this method. It also appears that due to the bruising of the tissue during grafting, an additional several days have to be added to the callusing time.

Our results are as follows:

<u>Apple Cultivar</u>	<u>Grafts Made</u>	<u>Graft Stand</u>	<u>Percent Stand</u>
'Starkrimson'	7,500 Machine Grafts	3,745	49.99%
'Spur Golden'	7,500 Machine Grafts	3,802	50.66%
'Starkrimson'	14,000 Hand Bench Grafts	9,592	68.5 %
'Spur Golden'	14,500 Hand Bench Grafts	9,849	67.9 %

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