

VOICE: What is the rate of Captan application for liverwort control?

ROSS MERKER: We use 4.4 oz Captan + 4 oz of a spreader-sticker (Wex) per gal., and drenching with that — put on with a back-pack sprayer.

VOICE: What about the snow-load on your A-frame greenhouses; and what are the dimensions?

ROGER MACKANESS: We get lots of snow, up to 6-ft., where we are, at 1000 ft., and at the mouth of the Columbia River Gorge. The A-frames are equilateral triangles, 10x10x10 ft. Quonset hut greenhouses will collapse under the snow but the A-frames will hold. In the houses we walk in a trench in the middle, with the 3 ft. benches on the ground on either side. There is very little cubic feet of space in the houses to heat in winter or cool in summer.

VOICE: Ross, do you need to use any bottom heat in your direct sticking method?

ROSS MERKER: None whatsoever; we stick the cuttings in May, June, and July. One of the purposes of this method is to get away from the heat bill.

## **PROPAGATION OF FRUIT TREES AT VAN WELL NURSERY**

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Fruit tree production numbers are difficult to ascertain as most nurseries do not readily divulge the number of trees grown and sold.

We can figure out that fruit trees in the Pacific Northwest are a big business. Based on the 1% certification fee, there appears to be 2,500,000 fruit trees sold by nurseries in the State of Washington each year. Many people do not realize what it takes to grow a saleable tree. My plan is to give you a quick overview of this process.

Based on our production, apple trees are the most popular trees grown, followed by pears, cherries, peaches and the rest of the stone fruits. Apples are, by far, the species grown in the largest numbers. I would suspect that all nurseries in the Pacific Northwest would have somewhat the same ratios.

The rootstocks for all fruit trees are started from seed, or are produced by clonal propagation. Limited number of seedlings and clones are being reproduced through tissue culture.

We have planted some tissue-cultured seedlings in the past and will continue to use them on an experimental basis to see what develops. One big problem is the cost.

At the present time most pome fruit nursery trees take three years to develop from seed while most stone fruit trees take two years to develop a tree. The seeds to start the seedlings are planted in either the spring or fall. In the case of pome fruits, seeds are planted in seed beds and grown one year and then transplanted into the nursery row for propagation. With stone fruits the seeds are planted directly in the nursery row and budded in the row without being transplanted. The exception is cherry seedlings which are handled as the pome fruits.

Starting about the end of July and going to the first of September nurseries do their budding. This is an active time in the nursery and a time that requires much care in order to produce the correct selections of cultivars that are true-to-name and meet the standards of the Fruit Tree Certification program of the state.

All nurseries maintain cultivar blocks called scion orchards. These blocks are inspected by the state and also indexed to insure that the trees are clean of known viruses. Washington certification rules include a 5% tolerance for indexed and certified stock.

Budding is the main propagation process used by nurseries in the state. We use the "T" budding method, although some nurseries use "chip" budding. We have experimented with "chip" budding for the last five years and have not seen any improvement over "T" budding. In "T" budding we expect 60 to 85% stands on stone fruits and 90 to 95% stands with pome fruits.

In the following spring all seedlings are cut back to the bud and the bud is developed into a nursery tree by constant suckering and limbing.

During the fall of the second year we are ready to dig our trees. This occurs about the first week of November. Before we can dig, all leaves must be removed. If the leaves were brought into storage mold would develop that would be harmful to the trees when stored.

Some nurseries remove leaves by using chemicals. We do not — all of our leaves are removed by hand. Leaf removal usually starts about the last week of October. Dr. Fenton Larsen, of Washington State University, has published a research paper showing that early removal of leaves may stop or delay the tree from going into dormancy.

The trees are dug in the fall before the ground freezes and put into storage where they are protected from winter weather. In storage the humidity is kept high to keep the trees from drying out.

During the winter months — December through February — the trees are graded according to specific standards set forth by the State of Washington Department of Agriculture, and by the American Association of Nurserymen.

Following the grading and warehousing of the trees, comes the sales and shipping season. During the month of April over 50% of the trees we have in storage are shipped or delivered. Shipping and storing the trees is another important link in the chain from the seed to the planting of the tree in the orchard.

All of the different steps of production and delivery of fruit trees requires careful and organized effort by all who are involved in the fruit tree nursery business.

## **BUDDING HEIGHT AND ORCHARD PLANTING DEPTH FOR MALLING APPLE ROOTSTOCKS**

CARL PERLEBERG

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The budding height on the dwarfing Malling apple rootstocks are presently 6 in above ground level, but budding height for apple seedlings are still at about 2 inches above the soil line. Let us describe the history of the Malling budding heights and how and why it changed.

In the 1950's when the dwarfing Malling rootstocks were first used in the United States many of the nurseries budded these new rootstocks at the same height as the seedlings — two inches. It was discovered soon in orchard plantings that these low-budded, high-planted Malling trees tended to lean badly. The budding height was increased in the 1960's to a maximum of 10 to 12 in. so that the plants could be planted at least 6 in. deeper at the orchard site thereby, hopefully, stabilizing the tree and always keeping the bud union out of the ground 4 to 6 in. to prevent scion rooting.

In the last 10 years the budding height has been lowered back down to 6 or 7 in. above the ground. This height of budding works very well with either a sled type mechanical planter or a 24 in. augered hole. Most mechanical planters travel at a 15 in. depth. The total vertical length of the root-