

FRIDAY AFTERNOON SESSION

December 10, 1965

The session convened at 1:15 p.m. in the Cleveland Room, Sheraton-Cleveland Hotel. Mr. Thomas Pinney, Jr. was moderator.

MODERATOR PINNEY: Our first speaker this afternoon is Mr. Robert C. Simpson from Vincennes, Indiana.

CRABAPPLE PROPAGATION BY CUTTINGS, GRAFTING, AND BUDDING

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Cuttings

Propagation by cuttings is the preferred method only under certain conditions. Use of hardwood cuttings has generally given poor results. Softwood cuttings under mist have given satisfactory rooting with certain varieties. Where field space is limited and misting facilities already available this method may be desirable. It is suitable where understocks are not readily available or where propagation is decided upon after the season is too far advanced to secure and line out understocks. Also it is the best method should it be desired to grow certain selections on their own roots.

Disadvantages of this method are that a longer time is required to produce a tree suitable for field or landscape planting. It is generally less expensive to propagate in large quantities by budding or grafting. Little is known about the variation in rooting response of the large number of crabapple varieties being grown.

Grafting

Grafting methods have changed little over the years. Usually this method of propagation is utilized in order to give profitable employment to experienced help at a time when little other work is possible. Grafting is useful for production of small one year liners where larger trees are not desired, or where time is all important in producing crabapple plants and size is secondary.

Grafting permits economy in use of understocks if this is important. Straight root seedlings are used, the root is cut into several sections and each short section is used with a relatively long scion. This method has been used to secure own rooted scion selections. Scion rooting is hastened by a copper or other non-rusting band around the graft, just above the union. As the graft enlarges with growth the band progressively girdles the root stock, thus encouraging own rooting of the scion selection.

Grafting has the following disadvantages:

- (1) A longer time is generally required to produce a tree the size of one produced by budding.
- (2) Root systems of grafts are not as heavy or well branched as those from budded trees, and are a year younger on a one year graft than on a one year budded tree.
- (3) The tops of one year grafted trees, grown on in the field for another year or two, generally are not as straight and well branched as a one year budded tree of the same size.
- (4) There is an added danger of knot or gall infection at the graft union. Use of grafting tape with complete sealing of the cut surfaces has reduced occurrence of wound overgrowth and pathological galls.

Budding

Budding is generally the preferred method of propagation for the crabapples, as well as for fruit trees. Advantages are:

- (1) Usually this is the simplest and easiest method.
- (2) It can be the least costly operation. One experienced man with the help of two grade or highschool boys (or girls) should be able to bud at least 100 trees an hour. One is needed to clean away and wipe each tree, the other to tie the trees as budded.
- (3) Much larger one or two year trees are possible from budding.
- (4) It is possible to produce a better formed top and heavier rooted tree by budding. With grafting, a one year top is produced on a two year root system which has been retarded by the removal of the seedling top. With piece root grafts the seedling root system is greatly reduced. With budded trees, the understock is planted and grown a full season before being cut back to the bud the second spring.
- (5) If scion wood is limited, a tree may be produced from each good bud whereas the normal graft requires a scion piece of at least three buds.

Consideration In Production

Certain considerations apply equally to budding or grafting although the following may apply primarily to budding.

First, understocks must be selected and ordered. Although commercial apple understocks are generally available, hopa and dolgo seedlings may be available. These are favored in the north central states because of their hardiness. Baccata seedlings are sometimes available, and occasionally zumi seedlings. Malling or Malling-Merton dwarfing understocks have sometimes been used.

Commercial apple seedlings are produced on the west coast. The seed is secured from the cider mills and usually consists of Jonathan and Delicious seed. This stock is carefully grown by firms who specialize in production of understocks. These seedlings are well grown and carefully graded, and are relatively

uniform. The $\frac{1}{4}$ inch grade is better for budding stock, the No. 1 probably better for grafting. Branch rooted seedlings are superior for budding or whole root grafting. Straight root seedlings permit securing more than one graft per tree, although usually this is short sighted economy.

Hopa seedlings tend to be more variable in size and vigor. The large percentage of seedlings with red wood and bronze leaves may lead to mixtures where similar type varieties are being grown. Too often a shoot from the root-stock is mistaken for the scion variety.

Baccata seedlings also are quite variable in size and vigor and produce a less desirable root system characterized by fewer and larger roots tending to strong horizontal growth. For the three seasons used, the varieties on baccata understock made 12 to 14 inches more growth in height, on the average.

Dolgo seedlings are said to be satisfactory.

Zumi seedlings are seldom available. Crabapples tried on this stock were not noticeably different above ground. The root systems, however, were typically heavier than apple understocks, with many more fine roots, and a more horizontal orientation. The difference was so marked it was not difficult to distinguish trees on this root stock.

Malling or Malling-Merton understocks are for production of dwarf fruit trees. They have also been used to a limited extent for dwarfing crabapples. This would seem of questionable merit as many of the Asiatic species of crabapple serve as indicators for a variety of latent viruses. If these species or varieties of these species were grafted or budded onto virus infected understocks, the results would not be satisfactory. Virus has been rather wide spread in vegetatively produced clonal root stocks.

Treatment of seedlings prior to planting is important. Careful pruning will assure a better branched root system, with less breakage at digging time. Powdery mildew may be a serious problem on the seedlings during the first season as the apple is highly susceptible. Several sprays may be necessary for control of this one disease. The recommendation for control is to dip the seedling tops in dormant strength liquid lime sulfur, then include sulfur in the first two or three sprays. Later eradicator sprays require much more costly materials.

Seedlings for budding should be kept growing vigorously. Fertilizers to be effective should be applied prior to planting or very early in the first growing season.

A soil treatment of Dioldren or similar material for control of soil insects prior to planting may be of great value. Such treatment followed by BHC in the spray program, has eliminated woolly aphids as a problem. Furthermore, the control of soil insects has practically eliminated incidence of root knots, hairy root and root rots.

The budding process with crabapples is simple and resultant stands should be high. A few varieties have been more diffi-

cult. Among these are Dorothea, Katherine, Sargent and a few others. Baccata understocks have given better results with the first two varieties in some cases.

Best results normally are secured where scion wood is of such size and vigor that buds can be removed free of wood beneath the shield. This is done by making a rather deep cut beneath the bud, and a second cross cut just through the bark. The bud shield may be separated from the scion by a slight pinching action. This makes possible the union of cambium layers of stock and of the entire bud shield. Where a silver of wood is left beneath the bud, satisfactory union may or may not take place, depending upon the skill of the budder and the variety of crabapple.

Where bush form trees are desired or in the case of varieties giving poorer stands, double budding may be helpful. By budding a row normally and then rebudding, preferably on another day, setting the second bud on the opposite side of the tree, the stand can be improved.

Buds placed on the south side of the understock break dormancy earlier in the spring and thus have a longer growing season. Buds placed on the side toward prevailing winds, normally westerly, are less subject to separation from understock by wind and rain. Also they tend to produce a more upright main stem.

Removal of the seedling portion above the bud should be done just as the bud breaks dormancy. The cut should be made at a 45 degree angle $\frac{1}{8}$ to $\frac{1}{4}$ inch above the bud, with the bud at the high point of the cut. A few varieties are reluctant to break dormancy unless and until the top is cut back.

Proper attention to removal of shoots from the understock, staking, tipping, and early removal of lower scion side branches are all necessary for production of a well shaped tree. Some varieties do not respond to tipping and seldom can be induced to produce a branched tree until the second year. Response to tipping is strongly influenced by time of year, possibly a combination of photoperiod and temperature. In the latitude of southern Indiana it is possible to produce a shapely well branched crabapple from a bud in one growing season.

Under most conditions a better crabapple tree may be produced more quickly and at less cost by budding as compared with propagation by cutting or grafting.

MODERATOR PINNEY: If you have any questions put them in the question box for tonight. Thank you very much, Mr. Simpson. Our next speaker will talk to us on the rooting of broad leaved evergreens, primarily *Rhododendron* cultivars and species. Mr. Richard Vanderbilt.