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HARDY FRAMEWORK TREES

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Winter damage to fruit trees usually occurs on trunks and crotches first. The trunks and crotches are the weak spots. Hardy frameworks reinforce these spots.

Nothing is more discouraging to an apple grower than for a freeze to peel the bark from the trunk or the framework crotches of a young tree ready to start bearing. That's why Washington apple growers, in the colder areas particularly, are interested in hardy framework trees. The trunk of an apple tree is a narrow channel through which vital food elements pass in going from the top to the roots and vice versa. It connects the top and the roots, neither of which can survive without the other.

The trunk is not only a very vital part of the tree but it also is highly susceptible to winter injury. Unfortunately, the trunk and framework crotches are more susceptible than any other part of the tree. Because of this peculiar combination of importance and susceptibility, many apple trees have come up to good bearing age only to be cut down or seriously damaged by a severe freeze.

Many Washington apple growers who have had this bitter experience are girding themselves against such disaster. As they make new plantings they are using trees whose trunks and crotches are tough enough to take the cold.

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Washington apple growers have been hot and cold about using hardy framework trees. Immediately following the 1955 freeze they were quite sure hardy framework trees were a must. At that time, those growers who suffered serious damage felt that hardy frameworks would have prevented much of the injury.

No one knows just how much protection can be expected from hardy frameworks, but it seems certain that enough protection may be gained to more than justify the extra cost of using hardy framework trees for new plantings in the colder areas at least.

Varieties to Use

There are many varieties which are hardier than Delicious and the other major commercial varieties grown in Washington. Unfortunately, research evidence does not separate three or four of these hardy varieties as being by far better than any other. We, therefore, can only list promising varieties along with their important varietal characteristics. The varieties are listed here in order of preference as nearly as possible with available information.

Antonovka - very hardy; tree structure excellent (produces wide angles)
Haralson - very hardy; tree structure good; possibly slight dwarfing
Hawkeye - very hardy; tree structure good; slightly susceptible to fire blight
Beacon - hardy; tree structure good; susceptible to fire blight
McIntosh - not as hardy as any of the above but hardier than Delicious
Red Astrachan - very hardy; tree structure excellent

When you think of protecting trees from winter injury you think first of the crotches and the trunk. Only in the colder areas, where extremely low temperatures sometimes occur without adequate snow cover, do you fear root damage. In such areas, using hardy roots as well as hardy frameworks may be desirable. More information is needed about hardy roots, but certain crab seedlings and seedlings from strictly hardy parents are hardier than commonly used seedlings.

Hardy framework trees as produced by nurseries are comparable with trees of commercial varieties. They are, for the most part, one-year whips and should be double headed the same as any other one-year-old tree. The orchardist himself does the topworking, starting either the first or second summer, depending upon the growth.

Top-working the Hardy Framework Tree

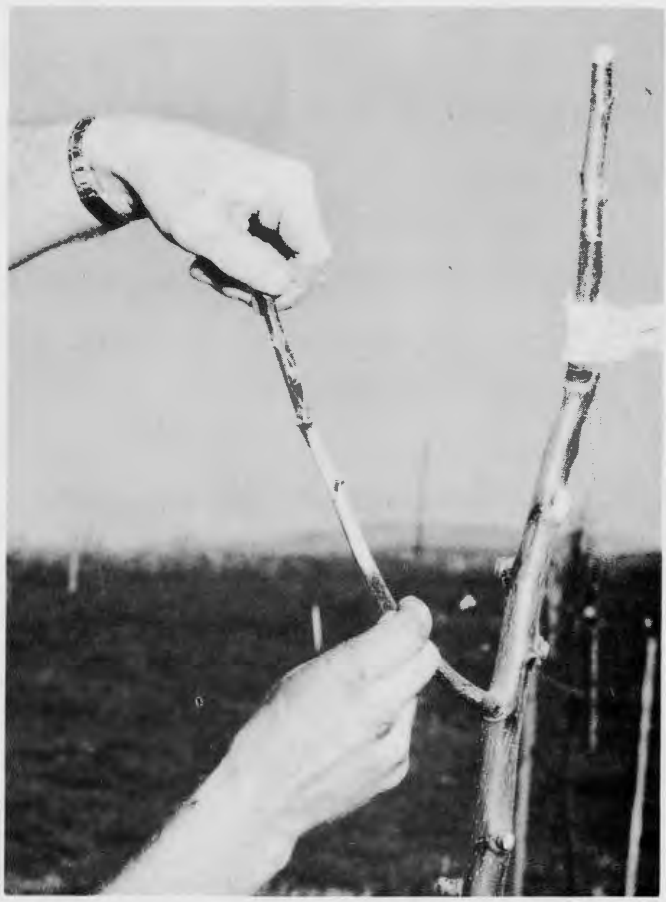
Top-working may be done by budding or grafting. Both are fast and neither need delay production more than possibly one season.

Budding

Summer budding

July and August are budding months. During this period of the first and/or second growing season is a good time for budding hardy framework trees. The branches for budding should be large enough to permit placing the buds 12 to 18 inches from the trunk. Placing the bud well out on the branch ensures hardy wood in and somewhat beyond the crotches. You of course can place the buds out even farther, but placing them out no more than 12 to 18 inches may result in twisting as the branch starts to bear. Twisting of course can be avoided by training the resulting branch.

Select for budding only those branches that are suitable for leaders. You may want to bud an extra branch or two, although it is better to place two buds on one leader than to bud two different branches, if you want to do some extra budding. When placing two buds on a branch, place both on the same side and one about four inches above the other.



Buds placed on lower side of branch encourage the branch to spread. Buds placed on upper side, on the other hand, grow upright and are hard to train.

If the stubbing method of training is to be used, the top leader need not be budded. By this method of training, the top leader is temporary. It is not allowed to come into fruiting.

June budding

Although late summer is the conventional and preferred time for budding, you can bud in June also. Buds set in June start growing one to several weeks later and may make a terminal growth of one to three feet that season.

Dormant budding

There is also what is called dormant budding. For dormant budding, you collect budwood and keep it fresh and dormant until the bark on the tree to be budded slips. The bark starts to slip as the first leaves come out. For dormant budding, use the same techniques as for summer budding. Dormant buds start growing later than buds set the previous summer, so they make less growth the first season. This kind of dormant budding is not in general use, but it does make it possible to extend the budding season.

The position of the bud on the stock

Where you put the bud on the branch is very important. As pointed out earlier, it should be well out from the trunk (12 to 18 inches). The exact location of the bud on the branch is important, too. Buds placed on the upper side usually make a very upright growth. The resulting shoots sometimes are difficult to train and often require special training to develop tree spread. Buds placed on the lower side, on the other hand, are forced to grow outward. This is true of buds placed on the right or left side although to a less extent. Placing the bud on the bottom or on one side of the branch, therefore, is preferable to placing it on the upper side.

Cutting off the budded branch beyond the bud

The budded branch must be cut off beyond the bud. Cutting it off here forces the resulting shoot into one to several feet of growth; whereas, failing to cut it off may result in little or no growth. When and where to cut varies with the type of budding, but eventually you cut the branch off at or slightly above the "T" (the point of the cross cut you make as you prepare the opening for the bud). When cutting the branch off, be sure your shears are very sharp.

When cutting off branch beyong bud, leave a short stub to protect the bud and new shoot. Cutting too close to bud causes it to dry out and birds sometimes break off unprotected new shoots.

It is customary to cut off summer budded branches the following spring, either before or as soon as the buds start to swell.

In any event wait until you can tell whether or not the bud has taken. Branches on which the bud failed may be whip-grafted or budded with dormant buds or in June or the following summer. Those to be rebudded need not be cut off although cutting them off will force some good one year old wood in which to bud.

Some budders like to make two cuts to avoid dieback and checking that otherwise sometimes kills the bud. They first cut the branch three or four inches above the bud and do this in the early spring or when the buds start to swell. Then two or three weeks later they make the final cut at the top of the "T".

When doing June budding, it is customary to partially break off the branch three or four inches above the bud. Do this just as

soon as you finish wrapping the bud. Then in about two weeks, cut off the branch at the top of the "T".

When doing dormant budding, give the bud a week or ten days to set before cutting off the branch. Cut it off in two or more stages, making the first cut eight to ten inches beyond the bud. Then in about two weeks after the bud has started to grow, shorten the branch still further. If at this time there are vigorous shoots that seem to be competing with the bud, remove them. Cutting these with a knife or shears is preferable to tearing them off because cutting makes a smaller wound. These shoots need not be cut close. Finally, when the shoot resulting from the bud is one to several inches long, cut the branch at the top of the "T".

Removing unwanted buds from budded branch

In the area between the bud and the trunk there are several buds originating from the stock. These buds or their resulting shoots must be eliminated sometime. Those on

Shoots arising between bud and trunk may stunt the bud. Cut off those on the top side of the budded branch.

the upper side of the branch, if left alone, often stunt the bud shoot. When they are about two inches long, remove them from the upper side. Again, cutting is preferable to tearing.

Unwanted buds beyond newly set buds

Cutting off the branch at the "T" in the spring as is the common practice eliminates all unwanted end buds, but it also exposes the bud shoot to the danger of being broken off. Birds sometimes alight on the shoot when it is still very tender. To avoid this danger you can leave a three or four inch stub temporarily and remove the shoots from the upper side, especially before cutting the stub off. Allowing all shoots on the stub to grow stunts the bud.

Grafting

You of course can whip-graft the hardy framework tree. The best time for doing this whip-grafting is in the early spring as or before the buds start to swell. Hot weather sometimes scalds late grafts. This grafting may be done the first or second spring after planting, depending upon the size of the branches to be grafted. These branches should be at least 1/4 inch in diameter. The scions need not be more than two buds long if scion wood is scarce.

Training these whip grafts differs somewhat from training grafts generally in that here you want to develop a scaffold branch without branching near the point of the graft. To avoid branching select the shoot that seems to be going in the right general direction and cut off the others or at least the competing ones. Do this when the shoots on the graft are about two inches long. Small shoots are not objectionable and can be removed later.

The procedure for removing buds and shoots below the graft is the same as removing them from budded branches.

Training the budded or grafted tree

When pruning the top-worked tree, retain more than just the budded branches. Extra branches encourage tree spread and help the tree to harden off.

The tree, being top-worked, has many unwanted branches that eventually must come off. Should you take them off in the early spring or later during the summer? Should you strip the tree of all except the budded branches or grafted branches in the spring, or should you simply stub part of the unwanted branches for the first season? These and still other practices are being followed with success. The procedure suggested here is offered as a possibility and not as an established recommendation.

Since the buds and grafts were placed well out (12 to 18 inches from trunk) on selected framework branches, you probably should take out some of them. They should not compete seriously with the buds and grafts, but keeping those that will help to spread the new framework branches seems to be worthwhile.

Follow up during the summer and pinch off or eliminate shoots that threaten to compete seriously with the buds and grafts. Shoots on the upper side of the budded or grafted branch are especially objectionable. You probably should go over the trees a couple of times during the summer.

This practice of stubbing and retaining, temporarily, some of the unwanted branches has some distinct advantages. It encourages tree spread and it tends to avoid over-stimulation. Stripping the tree down to nothing but the top-worked branches in the spring on the other hand, may stimulate late fall growth. Cultural practices that encourage the trees to harden off in the fall are most desirable on these young trees as you top-work them.

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