



Training and Pruning Sweet Cherry Trees for Mechanical Harvesting

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Success in mechanical harvesting of sweet cherries often depends as much on the way trees have been trained and pruned as on the harvest machinery used, crop load, or degree of fruit maturity. A multidirectional shaking force, usually applied to the trunk, must be transmitted to the fruit spurs throughout the tree. Shaking force is lost in excessively flexible limbs, especially those that arise at a wide angle from stout, stiff limbs, or long vertically hanging limbs.

Usually the upper and inner portions of the tree are harvested more easily than the outer and lower portions. The ideal tree has a few long, tapered scaffold limbs, which are mostly upright and evenly branched. Pruning for hand harvesting, which favors development of the outer and lower limbs, reduces the efficiency of mechanical harvesting.

Early training of trees to be low and extensively branched makes them difficult to harvest by machine. In general, the pruning methods for developing low, wide-spreading trees to be hand harvested are opposite to those best for development of trees for efficient mechanical harvesting.

Pruning may be done in the summer after harvest or during the dormant season. Summer pruning stimulates less new growth than winter pruning and may have a devitalizing effect. It reduces the hazard of postpruning bacterial infection. Pruning in fall is hazardous since it increases susceptibility to freeze damage.

Training young trees

In order to facilitate trunk shaking, the lowest limb should originate about 2.5 to 3 feet above ground level. Head

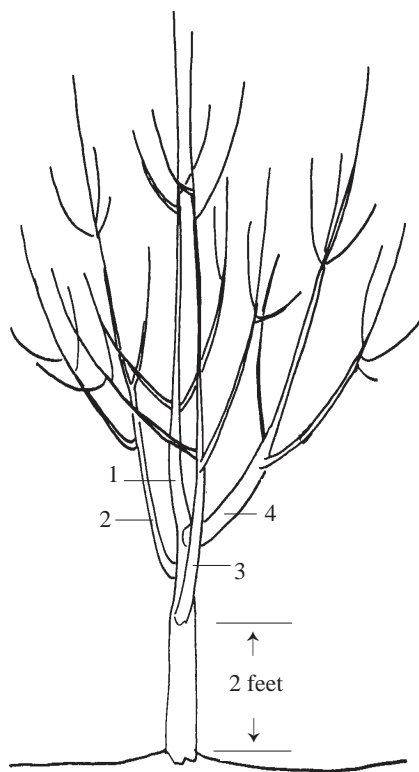


Figure 1.—An ideal four-leader sweet cherry tree trained for mechanical harvesting.

trees planted as whips to 3.5 feet at planting time and remove all shoots that develop below 2.5 feet. Limbs on branched nursery trees located more than 2.5 feet above ground level may be retained but should be cut about halfway back to balance the top with the roots.

Trees with the lowest limb originating much more than 3 feet above ground are likely to lean in the wind. With trees headed excessively high, it may not be possible to develop sufficient shaking amplitude for removal of fruit with a trunk shaker.

Allow from three to four main scaffold limbs to develop above the 2.5 foot level (Figure 1). If there are more than four main scaffold limbs, some will be small and will not transmit shaking force well. More than four primary scaffold limbs will interfere with the development of strong secondary limbs reasonably close to the point of heading.

With trees that are limb-budded or grafted in the orchard, it is best to aim for four main scaffold limbs because quite often one of the grafts or buds does not succeed. If you aim for only three limbs, a number of trees will have two equal-sized main scaffold limbs. Trees with only two main limbs are highly susceptible to splitting with a heavy crop load.

If the trees become too large for trunk shaking, it may be necessary to harvest with a limb shaker.

An ideal tree for limb shaking has only three main scaffold limbs. These should be upright and with 2 feet or more between the trunk and the lowest secondary scaffold limb. Where practical, avoid using shoots with narrow angles with the trunk.

The basic idea is to develop primary, secondary, and tertiary scaffold limbs that are upright and that diminish in diameter gradually from base to apex. For this reason, there should be no equal forks in main scaffold limbs. Since heading often results in equal forks, head sparingly, only where additional branching is highly desirable.

Branching at intervals of 3 to 4 feet on primary or secondary scaffold limbs

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is desirable. Removal of the terminal inch or two of annual growth when it is 3 to 4 feet long in the dormant season will assure branching.

Head upright shoots that are longer than 3 feet to about 3 feet in length. Head the outer shoot of roughly equal forks harder than the inner so that one side will become dominant. Remove secondary shoots that arise within 1.5 to 2 feet of the base of the main scaffold limbs.

Always prune to favor stiff upright limbs. Excessive pruning in the nonbearing years will delay and reduce cropping. Prune for training purposes in the first 2 or 3 years after planting and then do little or no pruning until after the trees are in full production.

Corrective pruning of mature trees

In mature sweet cherry orchards that have been pruned for hand harvest, there usually are too many low limbs (Figure 2). All limbs drooping to 4 or 5 feet of the ground should be cut back or removed in the winter. Remove all limbs that interfere with placement of the shaker head.

Remove all relatively small and limber main scaffold limbs. Do not leave stubs that eventually will provide entrance for wood-rotting fungi. Do not make flush cuts. Cut to, but not through, the branch collar. The collar can be found next to the raised bark ridge at each crotch.

In summer, soon after the orchard has been harvested, prune off those portions of limbs from which the fruit was not removed by shaking.

Long, willowy, or drooping limbs that originate above the lower portion of main scaffold limbs should be shortened to stiffen them so that they will transmit more of the shaking action. Since this will be a big job in some orchards, it should be done gradually.

Pruning the ends of old limbs will encourage new upright growth farther inside the tree. Often so many inner spurs have died that almost all of the remaining fruiting wood is on the outer portions of the limbs. Thus, if too much is pruned off at first, there will be an excessive reduction in fruit yield. Depending on their number, some drooping limbs high in the tree may be removed entirely.

If the tree has been recently topped, thin the upright shoots originating near the cut to one strong one. Head it at 3 to 4 feet above the topping cut to stimulate branching.

Gradually remove excess scaffold limbs and those that cross over others until each major scaffold limb with its system of secondary and tertiary limbs occupies a distinct sector of the tree.

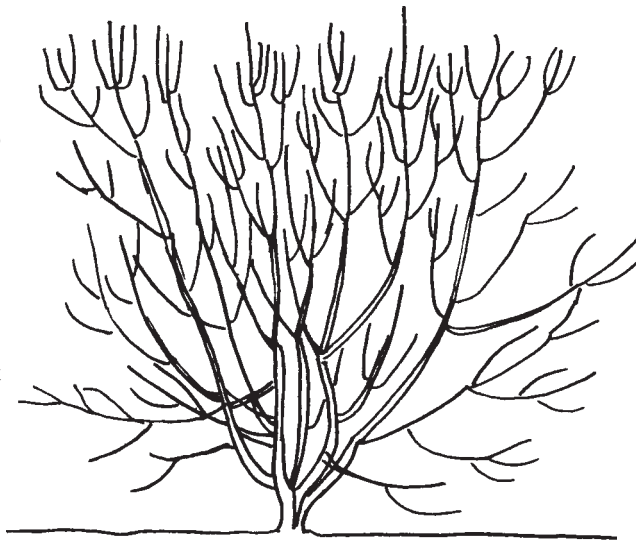


Figure 2.—A tree trained to be low and spreading, for ease of hand harvest, is difficult to harvest mechanically.

Gradually remove all thin, drooping wood in favor of stiff, upright limbs.

Pruning mature trees trained for mechanical harvesting

It should not be necessary to prune mature cherry trees that have been trained for mechanical harvesting more often than once every 2 or 3 years. Of course, pruning frequency will depend on such factors as growth rate, fruit size, bacterial infection, and cropping.

A rapidly growing tree may need pruning only to keep its size within bounds, while a slowly growing tree needs pruning for invigoration and to prevent excess fruit set. Since pruning is a dwarfing process and since small trees are easier to harvest mechanically than large ones, it is desirable to prune frequently. Pruning tends to reduce overcropping and to increase fruit size. Trees with excessively heavy fruit set are very difficult to harvest by machine.

Cut lower or drooping limbs to more upright side branches where possible. Cutting to a side branch will prevent excessive branching. Where well-placed side limbs are not available, limbs may be headed.

Distribute cuts over the entire periphery of the tree with special emphasis on the upper, outer portions. Unless limbs are pruned, those left long in the outer top will eventually bend over with fruit and be difficult to harvest. Regular pruning will stiffen the limbs and encourage fruiting on heavier wood.

Thin out shoots that originate near old pruning wounds. Remove limbs that cross the tree into another scaffold limb sector. Top the trees only as much as necessary to facilitate spraying or later pruning.

To reduce tree height, cut to a lower but still fairly upright side limb whenever possible. Do not delay topping to the point where heavy stubbing to weak, nearly horizontal side limbs is required.