



## Training and Pruning Tart Cherries

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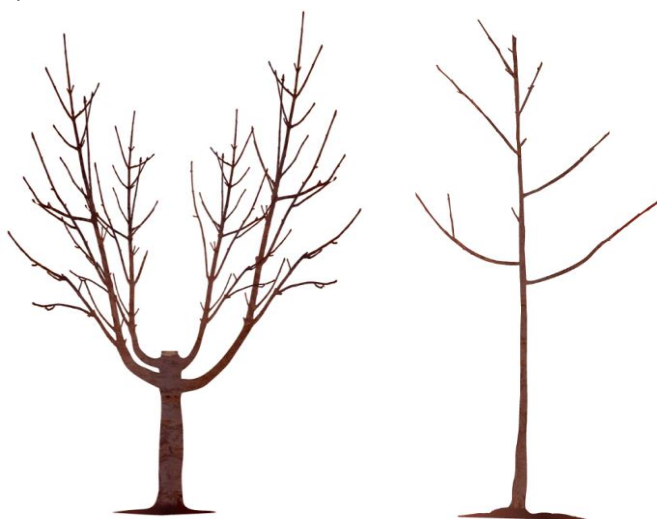
Training and pruning tart cherry trees is critical to the production of quality fruit. The benefits of proper pruning and training are abundant yields of high-quality fruit. Pruning and training early in the life of the tree is critical to establish the desired tree form, and to make future pruning and maintenance less complicated. It is important to note that not every tree will be picture-perfect, as trees are unique in their shape and form, however, following proper pruning principles will give imperfect trees the best opportunity to produce fruit. The main objectives of pruning are to 1) develop good structure and strong limbs, 2) control the height of the tree, allowing for easier harvest, 3) maintain a new supply of limbs that are of optimal fruit-bearing age and placement, and 4) remove any damaged, diseased, or non-productive growth.

### When to Prune

In general, trees should be pruned when they are dormant and after the danger of extreme cold has passed (February and March in Utah). Dormant pruning helps to support the tree's natural tendency to balance growth between the roots and shoots. Pruning effects this balance, and the tree responds predictably when limbs are removed. Removing branches during the dormant season changes the balance so that the tree has more root reserves than necessary for the available canopy. As a result, pruning during dormancy increases tree vigor and promotes growth over the following season.

### How to Prune

At planting, have the desired tree form in mind. Tart cherries are typically pruned to an open center form or a modified central leader form. The *open center* form (Figure 1) consists of 3 to 5 main scaffold branches that originate from the main trunk at about the same height above the ground. For trees that will be hand harvested, this can be 24 to 30 inches above the ground. The open center allows for good light penetration throughout the canopy and is commonly used in commercial production. The *modified central leader* form (Figure 1) consists of a single central leader (trunk) that is encouraged to grow for the first few years and then suppressed to control tree height. The central leader provides opportunity for whorls of branches to form that are well spaced with appropriate angles to encourage strong branches and good light penetration.

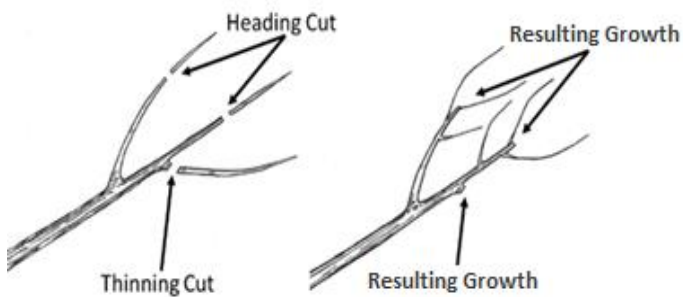


**Figure 1.** Open center form (left). Modified central leader form (right). Illustration by A. Pratt, USU.

When pruning, review the sequence of cuts that will be made before you start cutting. Visualize what the tree will look like once the branch is removed. Three main cuts are used in tart cherry pruning and should be well understood before beginning to prune: thinning, heading, and stub (or renewal) cuts.

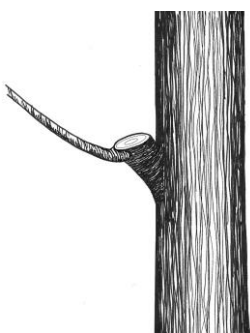
**Thinning cuts** are used to remove an entire shoot or branch to its point of origin from the main branch or lateral (Figure 2). This type of cut is used when regrowth of the branch being cut is not desired. Thinning cuts are used to redirect growth and improve light penetration and are preferred over heading cuts for minimizing tree size and removing excess shoots and external dieback.

**Heading cuts** (or heading back) remove the terminal portion, end, or tip of the branch, which stimulates shoot growth at the buds located below the cut, stiffens branches, and invigorates growth (Figure 2).



**Figure 2.** Heading and thinning cuts (left) and resulting new growth (right). Illustration by A. Spranger, USU.

**Stub cuts** (or renewal cuts) are used to replace a broken or damaged branch, a branch with a poor angle, or to generate new fruiting wood. Stub cuts remove a branch, but leave a short stub that will allow for new growth. Tart cherries require a longer stub to be left than apples or peaches. Stubs should be left at least 4-inches in length and should be cut so that the lower side is longer than the upper side to encourage new shoots to develop from the underside of the stub (Figure 3). Growth from the



underside will produce new branches that have wide, strong angles, and will produce fruitful, open growth. Stubs can produce one or several shoots. If a stub produces multiple shoots, one should be selected as the new branch and others should be thinned to remove.

**Figure 3.** Stub cut and the resulting renewal growth from the underside of the stub. Illustration by A. Spranger, USU.

When removing a branch, it is important that a “collar cut” be made instead of a flush cut. Flush cuts remove a branch to be flush with the trunk. These cuts take longer than collar cuts to heal and are associated with disease infection. Collar cuts leave a collar of tissue where the branch joins the trunk, and minimize the size of the remaining wound (Figure 4). Using this method promotes proper, rapid healing and reduces the risk of disease infection



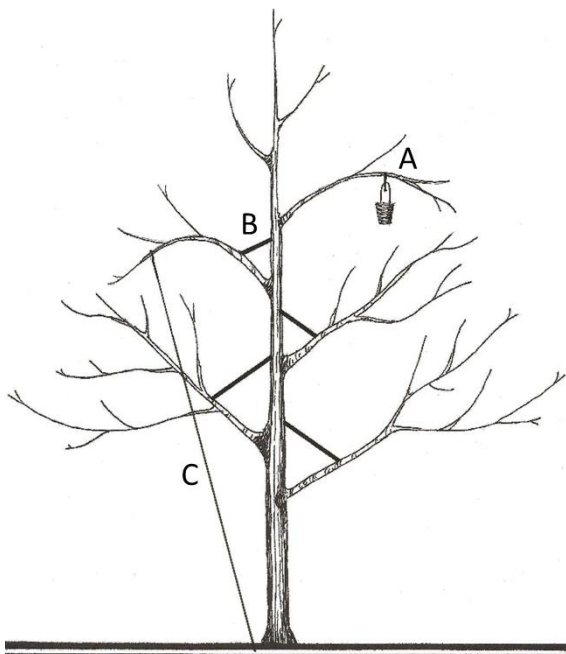
**Figure 4.** Branch collar pruning cut. A flush cut (dotted line) results in a larger wound surface area that takes longer to heal.

## Pruning

Tart cherries bear most of their fruit on short spurs found on two- and three-year-old wood. Spurs are short modified stems that develop flowering buds that produce fruit. Fruit can be borne on one-year-old shoots, but the nodes on 1-year-old wood where fruit are produced will not produce leaves or shoots in subsequent years and will result in barren shoots known as “blind wood.” Limbs that are older than three-years are not as productive and should be replaced with new growth. This can be accomplished with stub cuts. These stub cuts will promote renewal growth to maintain adequate reproductive (fruitful) buds. Care should be taken to maintain balance between vegetative growth (leaves and shoots) and reproductive growth (fruit), this is accomplished by balancing the fruiting branches of the tree with new vegetative growth with selective pruning cuts. Vegetative growth supports development of fruit in the current season, and new wood that will eventually provide flowering spurs. Excessive fruit growth will result in small, lower quality fruit and potentially broken scaffold branches.

Light is important for the formation of flower buds and fruiting wood in the canopy. Exposure to appropriate levels of light is most important in early summer months to promote maximum bud formation. Buds formed at this time influence future yield, becoming fruit and leaves the following year. It is critical that fruiting wood, including wood in the inner canopy, receives at least 25% full sunlight in order to form appropriately sized and well-colored fruit, as well as healthy and abundant flower and vegetative buds. Shaded wood forms fewer buds and wood that receives less than 20% full sunlight often dies during winter months.

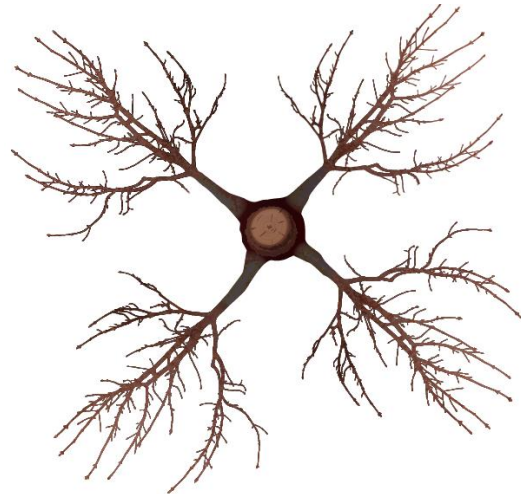
The angle of the branches arising from the main leader is important. Vertically oriented scaffolds with narrow crotch angles are prone to splitting off when the tree starts to crop. Limbs with wide crotch angles (around 50 to 90 degrees from vertical) are stronger and able to support heavy loads of fruit. Wooden toothpicks or small clothes pins can be attached to main leader just above the new shoot to help train shoots to a wide crotch angle. This is accomplished by carefully placing the toothpick into the new shoot on one end and into the scaffold on the other end, pushing the new shoot to approximately a 50 to 90° angle from vertical. Figure 5 shows several methods of increasing branch angles. A step-by-step guide to these two pruning forms follows.



**Figure 5.** Young tree with scaffolding branches spread to wider angles using weights (A), stick spreaders (B), and string (C). Notice that the base of branches form a 50 to 60 degree angle from the vertical central leader. Illustration by A. Spranger, USU.

## Open Center

The Open Center form (Figure 1) has 3 to 5 scaffolds originating from about the same level vertically on the tree and should be evenly spaced around the tree (Figure 6). This form allows for excellent light penetration to the center of the tree.



**Figure 6.** Top-down view of Open-Center form with four scaffold branches. Illustration by A. Pratt, USU.

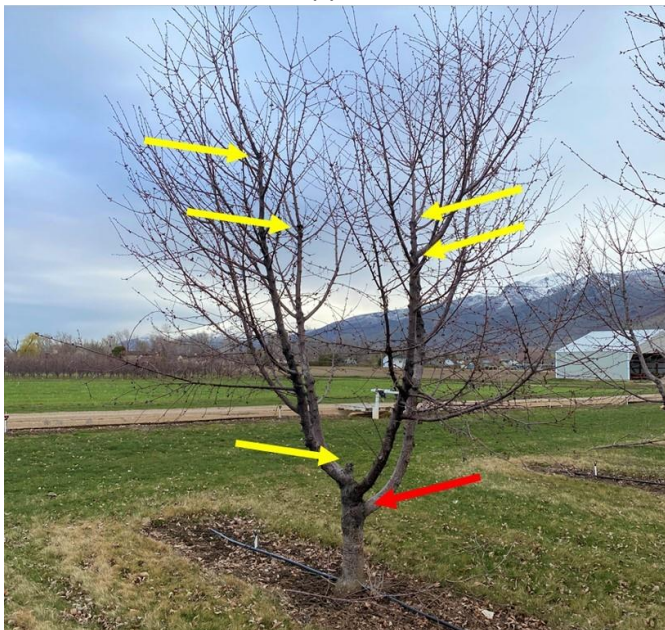
**Year of Planting:** Plant trees in the spring and prune shortly after planting. If trees are planted in the fall, prune the following spring. The main scaffolds should begin about 24 to 30 inches off of the ground. To achieve this, cut the new tree with a heading cut on the main trunk at about 28 to 36 inches above the ground. Existing branches at least 30 inches above the ground should be stub cut at this time, leaving 2 to 3 buds on each stub. Branches below 24 inches should be removed with thinning cuts. The objective of this first growing season is to get as much new shoot growth as possible and allow the root system to develop. If there is a limited number of shoots originating from the headed main leader, the growing points can be removed when these shoots are about 12 inches long to encourage branching and increased shoot numbers.

**Second Year:** During dormancy, select four limbs spaced evenly around the trunk and with the appropriate crotch angle to become the main side scaffolds (Figure 7). These will be new shoots that grew from the stub cuts made the year of planting. They should be approximately 28 to 36 inches above ground level and uniform in size. Any remaining limbs should be removed. During the growing season encourage the new scaffolds to maintain wide angles using the techniques illustrated in Figure 5. If the

tree does not have enough equally-sized and appropriately spaced shoots to use as scaffold branches, cut all branches back to 2-inch stubs. Stubbing everything back again in the second year will encourage stronger shoots that have wider crotch angles.

**Third or Fourth Year:** As the main scaffolds grow, heading (Figure 7) and thinning cuts can be used to direct the scaffolds upward and outward. Any branches that are growing back towards the center of the tree should be removed with thinning cuts.

**Fourth year:** The basic tree structure should be completed by the fourth spring and should have 3 to 5 scaffolds. Particular attention should be given to light penetration into the interior of the canopy. Limbs that block light penetration should be removed. Tart cherries can be fruitful in the interior of the tree if enough light is allowed to enter the canopy.



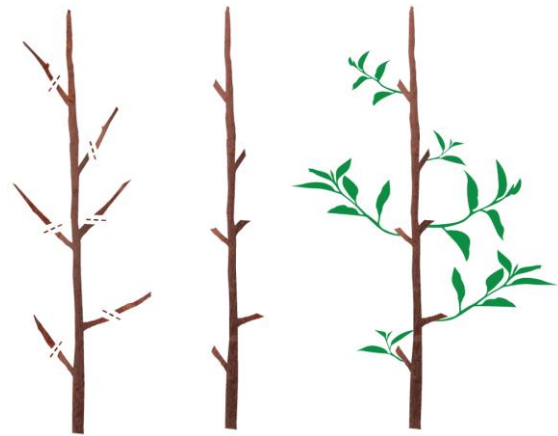
**Figure 7.** Tart cherry tree pruned to open center form. Yellow arrows point out heading cuts that were made. Red arrow indicates wide crotch angles, which will provide strong scaffolds able to support a heavy crop. All main scaffolds on this tree have crotch angles between 40° and 50° from vertical.

### **Modified Central Leader**

For the Modified Central Leader form (Figure 1), scaffold limbs should be spaced approximately 6 to 8 inches apart (vertically) and should be spaced evenly around the trunk.

**Year of planting:** Begin by planting a tree purchased from a nursery with a ½-inch trunk diameter in the spring. Scaffold limbs or feathers (small shoots that are growing out from the main trunk) that are on the tree at the time

of purchase often do not have the appropriate angle or are too low on the leader. Trees should be ‘whipped’ at planting (Figure 8); this is accomplished by cutting all of the existing branches to a stub, leaving just the main trunk of the tree with several short stubs. These stubs will produce new shoots during the summer months. From these new shoots, main scaffold branches will be selected when the tree is dormant. Use the techniques from Figure 5 to widen branch angles to 50 to 90 degrees from vertical during the growing season.



**Figure 8.** Growth response to stub cuts the first year of planting (whipped). Illustration by A. Pratt, USU.

**Second year:** During dormancy, select four well-spaced limbs to become the main side scaffolds of the tree from the new shoots that grew from whipping the tree. The first scaffold should be approximately 24 to 30-inches above ground level. Well-spaced limbs should be selected with appropriate crotch angles. Any remaining limbs directly over the four selected limbs should be stub cut to a length of 4 to 6 inches. The remaining stubs will support proper branch angle and will help direct the growth of the scaffolds outward instead of turning upward and growing vertically. These stubs can then be removed the following spring. Any lateral shoot that is similar in size to the central leader should be removed, this ensures that the central leader remains dominant. Any lateral that becomes the same size as the leader can compete for dominance and slow the growth of the leader.

If there are not three to four well placed scaffolds to choose from, the tree can be pruned to a whip again by pruning all laterals to a short stub. New shoots will grow from the stubs and scaffold selections can be made the next spring when the tree is dormant. Do not leave only 1 or 2 scaffolds on the tree as they will quickly equal the size of the leader, it is better to prune to a whip and repeat the scaffold selection process.

**Third year:** Choose 2 to 4 additional scaffold limbs, higher on the trunk than the original scaffolds selected the previous year, so that the tree has a total of 6 to 8 scaffolds. Stub cutting unwanted shoots located directly above desirable shoots will again force growth outward instead of upward creating a desirable branch angle. All other laterals as well as the uppermost limbs should be removed with thinning cuts. Limbs near the top of the tree will compete with the leader and slow growth.

Branches on the scaffolds created in year 2 should be thinned. Branches that are desirable on these scaffolds are those that are parallel to the ground. Any branches growing upward or downward should be removed.

If the tree was whipped in the second year, select 6 to 8 wide angled limbs, spaced 4 to 6 inches apart as scaffolds, if possible. If there are not 6 to 8 limbs, choose the best limbs available and finish forming the tree structure in the fourth year.

**Fourth year:** The basic tree structure should be completed by the fourth spring and should have 6 to 8 scaffolds, which should be thinned. The central leader can be allowed to become the last scaffold limb. This can be accomplished by using a thinning cut to remove the highest portion of the scaffold limb to an upright shoot. Head that shoot and remove all upright shoots that might compete with it. Repeat this process each year. Particular attention should be given to light penetration into the interior of the canopy. Limbs that block light penetration should be renewed. Tart cherries can be fruitful in the interior of the tree if enough light is allowed to enter the canopy.

### **Both Modified Central Leader and Open Center**

The trunk and the scaffold branches are permanent wood that are maintained throughout the life of the tree. Side branches that originate on these scaffolds are considered “temporary” as they are renewed periodically to keep the tree productive long term.

**Annual pruning:** For trees that are established with good structure, side branches need to be renewed annually. Depending on the size and age of the tree, this usually means about three to five of the largest side branches are renewed annually. Renewal cuts should be made, leaving a stub about 4 to 6 inches in length. New shoots will arise from the stub allowing for growth and renewal of fruiting wood in the canopy. This method of pruning maintains balance in the tree, allows for greater light penetration into the center of the canopy, and improves the health of the overall tree.

**Thinning:** Unlike other fruits that require thinning to ensure the growth of large, high-quality fruit, tart cherries require little to no thinning. Maintaining a balance between vegetative and reproductive growth with annual renewal pruning techniques will help to maintain this balance naturally. Trees will also drop fruit early in the summer to maintain balance.

### **Conclusion**

Training and pruning may seem overwhelming to a beginning fruit grower. However, by diligently following the pruning techniques and training methods detailed in this fact sheet you will be rewarded with a tree that is fruitful and easy to harvest.

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## **Additional Resources**

Kesner, C.D., & J.E. Nugent. [Training and pruning young cherry trees](#). Michigan State University Cooperative Extension Service. 15 July 2018.

Nugent, J.E. [Training tart cherry trees](#). Northwest Michigan Hort. Ctr. Res. Rept. Michigan State University. 2002.

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