



Training and Pruning Peach Trees

Sheriden Hansen, Tiffany Maughan and Brent Black

Introduction

Training and pruning peach trees is critical to the production of quality fruit. The rewards of proper pruning and training are abundant yields of high quality fruit that are easily harvested. Pruning and training early in the life of the tree will help establish the desired form of the tree and make future pruning and maintenance less complicated. The main objectives of pruning are to 1) develop good structure and strong limbs that will be productive, 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 or diseased growth.

Peaches bear fruit on 1-year-old wood and maintaining a constant supply of new growth is essential to maintain productivity; this is accomplished with renewal pruning. Once the tree is established, pruning unwanted shoots back to short (1 inch) stubs will promote renewal growth to maintain adequate reproductive (fruitful) buds. Pruning should maintain a balance between vegetative growth (leaves and new shoots) and reproductive growth (fruit). Vegetative growth is important to provide leaves that will support the developing fruit as well as new wood that will provide flower buds for the following season. While the end goal is fruit production, take care to ensure that reproductive growth is kept in balance. Excessive fruit load will result in small, lower quality fruit and broken scaffold branches.

When to Prune

In general, trees grow to maintain balance between roots and branches. Pruning affects this balance, and the tree responds predictably when limbs are removed. Removing branches during the dormant season disturbs the balance so that the tree has more root reserves than necessary for the available canopy, and this excess energy will promote additional new growth the following season. As a result, pruning when the tree is dormant tends to increase the vigor of the tree. Removing branches during the summer when the tree is actively growing will remove resources, resulting in reduced tree vigor. Both summer and dormant pruning have their place in peach orchard management.

Dormant Pruning: Peach trees require a period of chilling. Once the tree has accumulated the required number of chilling hours, the tree loses cold hardiness and breaks dormancy when temperatures become favorable for growth. Watch the weather forecast and avoid pruning right before very cold weather is predicted. Trees have decreased cold tolerance for about 2 weeks after pruning. Pruning too early in the winter can reduce cold hardiness in the surrounding tissues and freezing temperatures soon after pruning can result in damage to fruiting buds, cause dieback of 1-year-old shoots, and injury to bark on major branches and the trunk. Pruning after bud swell can cause bud loss and damage as well as loss of tree vigor. Dormant peach tree pruning in northern Utah typically occurs in February and March.

Summer Pruning: The purpose of summer pruning is to increase light penetration and air flow in the canopy. Vigorous upright shoots often fill the open center of the tree, which can contribute to fungal disease and poor fruit coloration due to poor air movement and internal shading. Summer pruning, usually done in June or early July, will improve fruit color and stimulate the formation of flower buds on shoots in the lower part of the canopy.

Diseased branches should be removed and destroyed throughout the growing season, to prevent the spread of infection through the canopy. Infected fruit and fallen leaves should be cleared and disposed of. Orchard sanitation is important to prevent the spread of disease. Wet springs and dense canopy foliage can contribute to the growth and spread of pathogens.

Insect pest strikes should also be pruned out and removed. [Peach Twig Borer](#) is a common insect that can cause shoot strikes in the late spring and early summer. These strikes are caused by larval feeding in terminal shoots on new growth in peaches and are characterized by wilted young shoots. These should be pruned out of the tree and destroyed throughout the season. If not removed, subsequent summer generation larvae can feed on fruit, causing fruit damage.

How to Prune

At planting, have the desired tree form in mind. Peaches are typically pruned to a vase or open center form. When pruning, review what sequence of cuts will need to be made before you start cutting. Visualize what the tree will look like once the branch is removed.

Three main cuts are used in peach tree pruning and these should be well understood before beginning to prune. Thinning, heading, and stub cuts are the most used pruning cuts.

Thinning cuts (Figure 1) are used to remove an entire shoot or branch to its point of origin from the main branch or lateral. 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. 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 to heal than a collar cut and are associated with disease infection. Collar cuts leave a collar of tissue where the branch joins the trunk (Figure 2), and minimize the size of the remaining wound. Using this method can promote proper and rapid healing and reduce the risk of disease infection and external dieback.

Heading cuts (or heading back) remove the terminal portion of the branch, which stimulate shoot growth below the cut, stiffen branches, and invigorate growth (Figure 1).

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 (Figure 3). Stub cuts remove a branch, but leave a short stub that will allow for new growth. The stub should be cut so the lower side is longer than the upper side to encourage new shoots to develop from the underside of the stub. Growth from the underside of the stub will produce new branches that have wide, strong angles and will produce fruitful open growth. Stub cuts can produce one or several new shoots. If the stub produces several shoots, one should be selected as the new branch and the others should be thinned to remove. Peach production requires light. Light penetration throughout the canopy, especially in the center of the tree, should be considered when pruning. Light is critical for bud production and the formation of fruiting wood in the canopy. Exposure to appropriate levels of light is most important in June and early July to promote maximum bud formation.

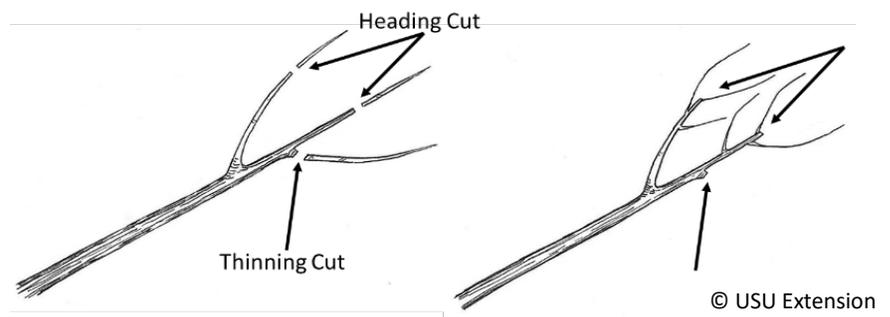


Figure 1. Heading and thinning cuts (left) and resulting new growth (right). Illustration by A. Spranger, USU.



Figure 2. Pruning cut resulting in a branch collar. Making a flush cut (cut along dotted line) would result in a larger wound surface area and takes longer to heal. Photo credit: Tiffany Maughan

Buds being formed at this time will become fruit and leaves the following year and will influence future yield. It is critical that all fruiting wood receive at least 25% full sunlight in order to form large, 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 the winter months.

To optimize incoming light, peach trees are trained to specific systems. Several different training systems are used, typically with open centers to allow for good light penetration. Two systems that work well for Utah, Open Steep Leader and Quad V, are detailed below.

Open Steep Leader

The Open Steep Leader system (Figure 4) is a common system used for backyard orchards. This method allows for good light penetration throughout the canopy. This is an open center system where branches are encouraged to bifurcate (divide) to fill the upper canopy. The increased canopy volume can improve early and mature yields.

Establishing the Open Center: Trees should be planted in the spring and be pruned shortly after planting. If trees are planted in the fall, prune the following spring. Scaffold limbs in this system should begin 20 to 24 inches off the ground. The main trunk or leader of the newly planted tree

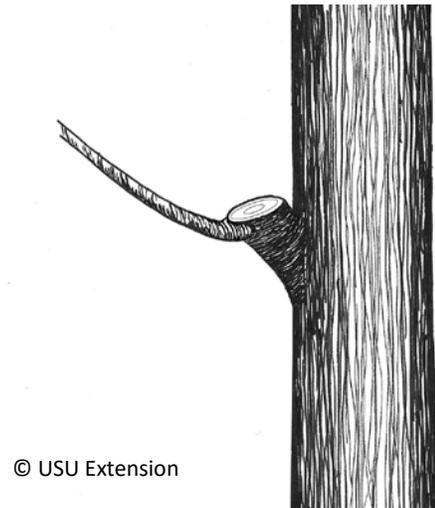


Figure 3. Stub cut and the resulting renewal growth from the underside of the stub. Illustration by A. Spranger, USU.

should be cut with a heading cut 4 to 6 inches above the desired height of the scaffolds. All existing branches should be stubbed at time of planting, leaving two to three buds on each stub to control growth and attain the desired tree form.

Establishing the Primary Scaffolds: Of the new shoots that grow during the first summer, some will be selected to become the primary branches or scaffolds in the tree. Pruning during the summer after planting is effective in establishing the primary scaffolds and directs growth into the desirable scaffold branches as well as reduces winter pruning. Summer pruning should be done before growth stops. In order to obtain branches of the appropriate angle, allow proliferation of many branches from the top of the main trunk during the beginning of summer. By July, prune out all but the shoots growing at the desired angle of 50 to 65 degrees from vertical. If there is a limited number of shoots originating from the headed main leader, the growing points of these shoots can be pinched off when they are about 12 inches long to encourage branching and increased shoot numbers. Any shoots forming lower on the trunk than the desired height of the scaffolds should be removed.

If summer pruned, very little dormant pruning the first winter will be needed. If you did not summer prune, select the shoots that will become the main scaffolds during the first dormant season. Three to four main scaffolds should be selected and all others

removed. It is critical that these scaffolds are of uniform size, have the appropriate angle and are uniformly distributed around the tree. New vertical growth with branch angles less than 50 degrees from vertical should be pruned out as branches that are too upright have excessive vegetative vigor. Additionally, branches with narrow crotch angles form weak connections to the trunk and are likely to break in later years under a crop load. Avoid horizontal limbs. Remove any branches growing below the scaffolds on the trunk, water-sprouts, upright, broken, or diseased growth.

Establishment of Secondary and Tertiary Scaffolds: As the three to four main scaffolds grow, heading and thinning cuts can be used to direct the scaffold upward and outward. In early summer, remove any vigorous upright shoots that may develop near the center of the tree. When scaffolds reach a desired length of approximately 2 feet, a heading cut should be used to encourage bifurcation. By late June, secondary shoots should develop on the terminal shoots. The upright portion of the terminal shoots can be pinched just above an outward growing secondary shoot. This will help direct the growth of the secondary scaffold. Select two of the new branches with proper angles to keep and thin out any others. The two new branches are the secondary scaffolds and should be allowed to grow outward and upward until they reach a desired length. A heading cut should then be made to bifurcate the secondary scaffold, forming tertiary scaffolds. Summer pruning to secondary and tertiary scaffolds should be completed by early July. The end result should be 4 primary scaffolds, 8 secondary scaffolds, and 16 tertiary scaffolds reaching a terminal height of 10 to 11 feet. The form of the tree should be open in the center with branching scaffolds around the tree. Scaffolds are permanent wood that will not be renewed.

Renewal Pruning of Fruiting Wood: Fruiting wood will form as small lateral shoots on the scaffolds. Any fruiting laterals older than 1 year should be stub cut back to scaffold wood to

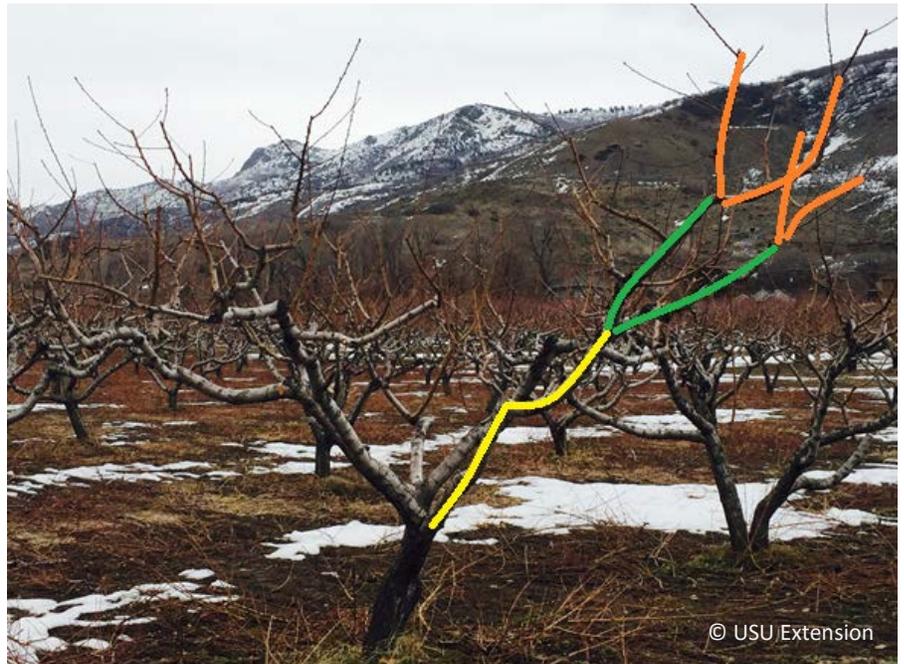


Figure 4. Peach tree pruned using the Open Steep Leader system. There are main scaffolds (yellow line), secondary scaffolds (green line), and tertiary scaffolds (orange line). Photo credit: Sheriden Hansen.

encourage renewal growth. The ideal fruiting shoot is “pencil sized” or about ¼ inch thick at the base, has no secondary shoots, and is 12 to 24 inches long. Laterals this size are ideal for holding one to two peaches. Laterals that are too small to support fruit, or that are too large and vigorous to be fruitful should be removed. If the tree has produced an overabundance of fruiting laterals, thin them to leave one every 4 to 6 inches along the branch.

Quad V System

An alternate approach to tree form is the Quad V system (Figure 5). This system is used in commercial orchards, but can easily be applied to the home orchard setting. This training system is simple and consumes less pruning time than the bifurcated system, but does not fill canopy space as quickly. The Quad V is an open center system with four to five permanent scaffolds or “columns” originating around the trunk. The columns do not branch or bifurcate, but are single columnar scaffolds extending upward and outward from the trunk origin.

Establishing the Open Center: Beginning establishment is very similar to the bifurcated system; the open center is established using the same initial methods. However, instead of choosing three to four scaffolds, four to five are chosen as columns.

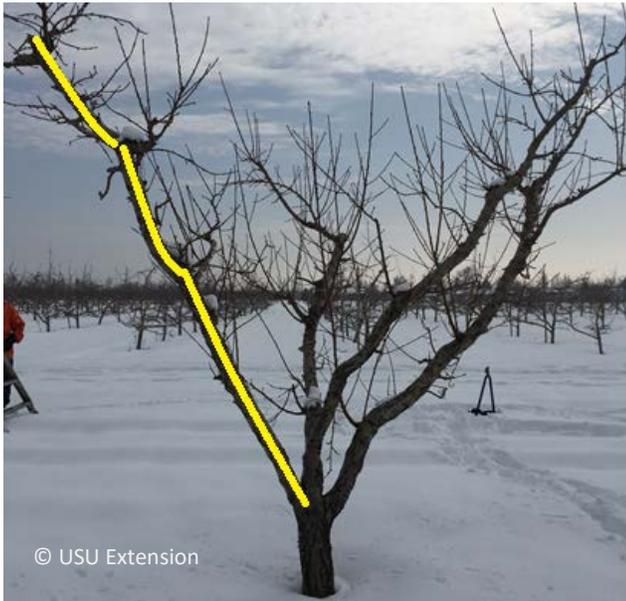


Figure 5. Peach tree pruned using the Quad V system. There are main scaffolds (yellow line) that have fruiting wood forming all along them. Photo credit: Sheriden Hansen

Establishing Columns: New growth that is formed over the first summer will become the four to five main columns in the tree. Branches should be uniformly distributed and grow at a 30 to 45 degree angle from vertical. Low shoots that form at a narrow angle should be removed.

During the dormant winter period, four to five main scaffolds should be selected to form permanent columns. These columns should be at different compass points around the main trunk to ensure they are evenly distributed and the tree is balanced. Columns should never be above each other. Any watersprouts, upright, broken, or diseased growth should be removed at this point. Any branching, or bifurcation, should be thinned to maintain a single column form. Column angle can be corrected with thinning and heading cuts. When the columns reach the desired height, 8 to 11 feet, a heading cut can be used to control height.

Renewal Pruning of Fruiting Wood: Small shoots will form on the columns, which will be the fruiting wood (Fig. 6). Renewal pruning should be used to remove 2-year-old branches back to the scaffolds to ensure an annual supply of fruiting wood. Renewal pruning should follow the same procedures previously discussed in the steep leader system.



Figure 6. Peach tree during pruning showing fruiting wood, heading, and stub cuts. Photo credit: Sheriden Hansen

Thinning

Crop load management is important for quality peach production and can be achieved through pruning and thinning practices. When pruning, it is important to differentiate between vegetative and fruiting buds in order to not over or under prune. As buds begin to swell, floral and vegetative buds become distinguishable from one another. Floral buds have a rounded shape and are typically larger in size, while vegetative buds remain smaller and torpedo or oblong shaped (Fig. 7).

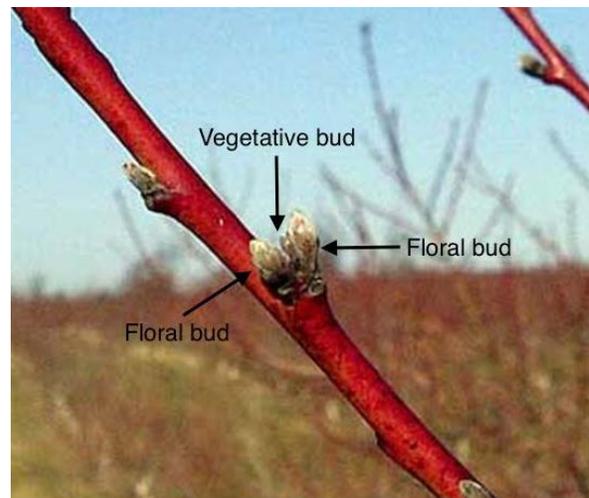


Figure 7. Floral and vegetative buds on 1-year-old wood. Photo used with permission from Michigan State University Extension.

Each lateral fruiting branch should be able to support one or two fruit, depending on size. Young peach wood can have up to three buds (two floral

and one vegetative) per node (the point of attachment for last year's leaf). However, there may be fewer or no buds at each node. Often buds damaged during winter cold will abort, so it is important to assess viable bud numbers before beginning to prune to ensure that adequate flower buds are kept.

Peaches nearly always set an overabundant number of fruit, more than the tree can support. In order to get large, quality peaches, the crop load must be limited by thinning.

For peaches, thinning occurs both during dormant pruning and after fruit set in June or July depending on cultivar and climate. Where there is good flower bud development along the 1-year old shoots, dormant pruning can be used to reduce the number of pencil-sized fruiting laterals that are left behind. In years where an over-abundance of fruiting laterals are produced, thin them to leave a fruiting lateral every 4 to 8 inches. Then, when the developing fruit are about 1 to 1.5 inches in

diameter (usually June to early July in Northern Utah), excess fruit is removed by hand to leave one to two fruits per 1-year-old fruiting lateral.

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.

Additional Resources

Marini, R.P., 2013. Pruning peach trees. Virginia Cooperative Extension. Publication 422-020. http://pubs.ext.vt.edu/content/dam/pubs_ext_vt.edu/422/422-020/422-020_pdf.pdf

Olsen, J. 2011. Training and pruning your home orchard. Pacific Northwest Extension Publication 400. <https://catalog.extension.oregonstate.edu/pnw400>

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