



Fruit trees need pruning to create strong limbs that can support a plentiful fruit crop. Some fruit trees require extensive pruning every year, while others need very little. Gardeners may be reluctant to prune without understanding basic principles and objectives. The main goals of pruning are to

- Develop a strong tree structure. Pruning is especially important when trees are young.
- Allow light to penetrate the canopy. Sunlight is needed to produce fruit buds for the following year and for fruit to color properly.
- Control tree size. A small tree is easier to thin, harvest, and prune than a larger tree. Pest control is easier and more effective.
- Remove damaged wood. High winds, ice storms, heavy fruit loads, diseases, and insects can damage fruit trees. Pruning speeds recovery and prevents further damage.

## Pruning Tools

Before pruning, make sure you have the proper tools. Figure 1 shows the basic tools every fruit gardener needs:

**A. Pruning shears** are best for small cuts. A scissor-type shear is less damaging to wood than an anvil type.

**B. Loppers** are similar to hand shears but have long handles and can cut larger limbs. Depending on size, loppers can prune wood up to 1 inch in diameter.

**C. Pruning saws** are useful for cutting wood larger than 1 inch or branches that can't be reached with loppers. Some pruning saws fold down for storage.

**Pole pruners** (not shown) enable the user to reach high limbs while standing on the ground.

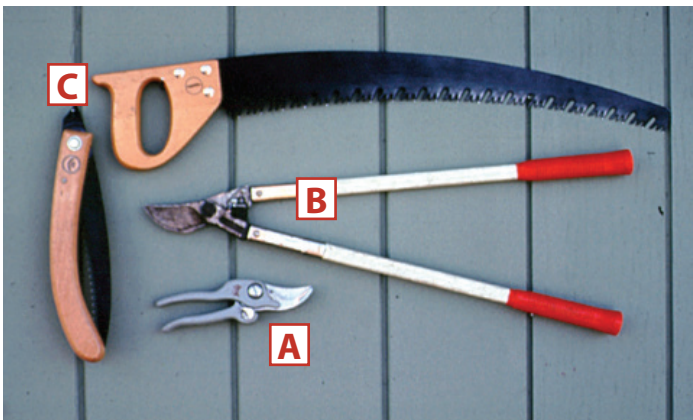


Figure 1. Pruning tools should be sharp and well-maintained.

## When to Prune

It is best to prune in late winter or early spring just before active growth begins. This is normally March in much of Kansas. In southern Kansas trees may need to be pruned earlier, from around Valentine's Day through early March. In early summer, prune to remove water sprouts and suckers. Water sprouts are shoots that grow straight up from a larger branch or the trunk (Figure 2). Suckers grow from the base of the trunk or the roots (Figure 3).

## Pruning Cuts

There are three basic pruning cuts: a thinning cut, a bench cut, and a heading cut. A thinning cut removes a shoot or branch back to where it originates (Figure 4), and a bench cut prunes a vigorous upright shoot back to a more horizontal side branch (Figure 5). Thinning and bench cuts open up the tree to allow more light and air movement through the canopy.



Figure 2. Water sprouts growing on an apple tree.



Figure 3. A sucker growing from the base of a fruit tree.



Figure 4. Thinning cut.



Figure 5. Bench cut.

Almost all cuts should be thinning or bench cuts. A heading cut (Figure 6) removes part of a branch back to a bud and stimulates growth of side branches. Heading cuts encourage young trees to form branches so the main, or scaffold, branches can be selected. Scaffold branches provide the framework to support the weight of the fruit.

### Thinning Cuts

Thinning cuts should be made at the collar, not flush with the branch (Figure 7). A cut at the collar leaves a smaller wound and heals more quickly. Do not leave a stub as it can rot and leave an opening for insects and diseases to enter. Use a three-step method for larger cuts to prevent bark from tearing (Figure 8). First, cut about a third of the way through from the bottom of the branch, about 6 to 12 inches from where it attaches. Make a second cut at the top down to meet the first until the branch falls away. Finish by removing the remaining stub at the collar region.

### Planting Time Pruning

Fruit trees should be pruned during the first three years to develop a structure that can support fruit production (Figure 9). At planting time, a tree that already has side branches needs very little pruning except to remove damaged wood or rubbing branches. A tree without side branches, or whip, should be pruned to a height of 36 inches using the heading cut mentioned earlier. Make the cut just above a bud to encourage side branches to form.



Figure 6. Heading cut.

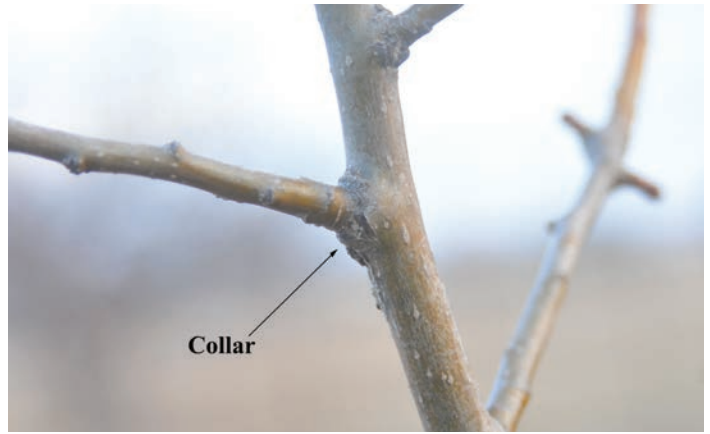


Figure 7. Collar.

### Second Year

The following spring, select two or three scaffold branches to give the tree its form. The first branch should be at least 20 to 24 inches above the ground, and the other branches at least 6 inches apart on the trunk and attached at about a 45-degree angle. Prune off all other branches to encourage growth on those that were kept.

### Third Year

Before the tree breaks dormancy the third year, choose one or two more main scaffold branches for a total of four or so. If a branch is not attached at the recommended 45-degree angle, use a plastic or wood spreader (Figure 10) to widen the angle of the young limbs. Spreading the limbs strengthens the branch attachment and encourages fruiting at a younger age.

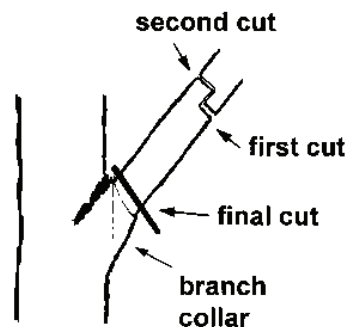


Figure 8. Make three cuts to remove large limbs and avoid trunk damage and bark stripping.



## Pruning Cuts to Develop a Strong Tree Structure

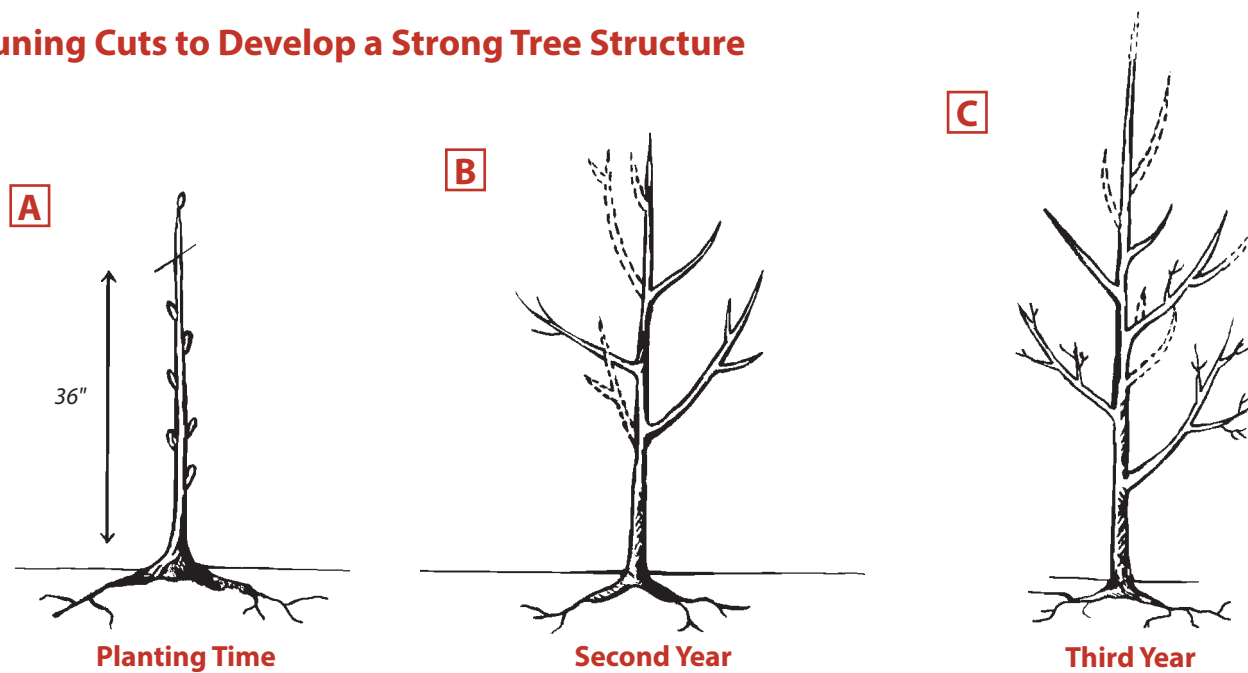


Figure 9. Pruning cuts during the first three years. (A) At planting time, cut the whip back to 36 inches. (B) In the second year, select two to three scaffold branches. Prune off all other branches. (C) Select an additional one or two scaffold branches during dormant pruning the third year.

### Pruning Older Trees

Use this checklist when pruning older trees. Stop when no more than 30% of the tree has been removed. Dead branches do not count in the 30%. These guidelines apply to most trees.

1. Remove all dead, dying, or diseased branches.
2. Remove all suckers and water sprouts that were not removed during the growing season.
3. If two branches form a weak angle, remove one of the two branches.
4. If two branches rub, remove one of the two branches.
5. Reduce the length of the long branches, cutting them back to a shorter, smaller branch.
6. Remove branches growing toward the interior of the tree.
7. Thin the interior of the tree.



Figure 10. Limb spreader.

### How to Prune Apples and Pears

Apples and pears often are trained to a central leader system with side branches extending to either side of the central leader, or trunk, similar to a Christmas tree. In a central leader system, the scaffold branches should be attached at a wide angle (45-80 degrees) and spaced at least 6 inches apart on the trunk. Limbs should be well distributed around the tree with no branch directly above another. This arrangement balances the fruit load, so limbs are less likely to break.

Apple varieties vary in their growth habits. Some trees, such as Red Delicious, are naturally upright and require more branch spreading. Others, such as Jonathan, are more open. Pear trees tend to grow more upright than apples, and limbs may need to be spread when trees are young. Some apple and pear trees produce small spurs (Figure 11) rather than longer shoots on young branches. Each spur produces a flower cluster. Spurring trees produce fewer limbs and do not require as much pruning.



Figure 11. Spurs.

Most apple trees must be pruned every spring. Follow the directions on page 3 for pruning older trees. Prune shoots in the interior of the tree to allow sunlight to reach fruit throughout the tree. Pears often need little pruning except to prevent branch rubbing or remove damaged wood (Figure 12). Even moderate pruning can lead to the production of water sprouts.

## Summer Pruning

Apples and pears are often grown on dwarfing rootstocks to produce smaller-than-normal trees. Dwarfing rootstocks may produce suckers from the base of the trunk or roots underground, but these are not the same as water sprouts. Water sprouts grow straight up from a larger branch or the trunk and are often the result of significant pruning. Suckers and water sprouts should be removed during the summer. Waiting until spring stimulates the tree to produce more.

## Thinning Fruit

Apple trees often produce more fruit than they can mature. Apples should be thinned every year to ensure good crops (Figure 13). A heavy fruit load can interfere with summer fruit bud development, resulting in a small to nonexistent crop the following year. When there are too many fruit, size and quality go down and tree limbs can be damaged. Thinning reduces the load and prevents branches from breaking under the weight of the maturing crop.

Thinning also encourages the growth of larger fruit on the current year's crop. When thinning, the goal is to retain one fruit every 6 inches on average. Leaving two fruit closer than this is not a problem as long as the average fruit spacing on the branch is about 6 inches.

Begin the thinning process when fruit is about the size of a nickel. Start by removing damaged, small, discolored, or malformed fruit, but keep in mind that some perfectly good fruit will have to be removed. Thinning is done by cutting the stem or snapping the fruit off with the fingers. Most pears do not need to be thinned unless trees have a tendency to bear biennially or drop fruit early. Follow the same thinning procedures for pears as for apples.



Figure 12. Pear trees grow upright and need less pruning than apple trees.



Figure 13. Apple fruit cluster in need of thinning.

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