

Pruning Fruit Trees

Extension Horticulture

Fruit trees should be pruned every year to maintain their health, encourage balanced growth and productivity and control their size and shape. When you plant a fruit tree, you should be dedicated to giving the tree proper care and pruning to maximize both fruit quality and quantity throughout the life of the tree. Understanding the principles of pruning and practicing them are important. Pruning is both an art and a science. Artists understand **what** they are doing and scientists understand **why**. The objectives of tree pruning are:

- **Develop strong tree structure.** This should begin when trees are planted and continue each year thereafter.
- **Provide for light penetration.** Good light quality throughout the tree increases fruit bud development for following years and increases the quality of the current crop.
- **Control tree size.** Most fruit trees require pruning to control branch spread as well as tree height. This also serves to encourage new growth that will result in new fruit-bearing areas.
- **Remove damaged wood.** Some wood damage occurs almost every year from such things as wind damage, fruit weight, winter injury and disease and insects.

Pruning is a dwarfing process and may result in a slight reduction in yield compared to an unpruned tree, but the size, color and quality of remaining fruit will be improved.

When to Prune

The best time to prune is during late winter or early spring just before the beginning of active growth. If large blocks of trees are to be pruned, time it so that you finish just before bud break. It will not harm trees if sap is beginning to flow at the time you prune. The main reasons you should prune during the late dormant period are:

- Wounds heal quickly when growth starts.
- Undesirable branches and other wood to be pruned can be easily seen since there are no leaves on the tree.
- The bark is less likely to tear when cuts are made.
- Trees pruned in early winter may be damaged by low winter temperatures that occur after pruning.

Summer pruning may also be used to control growth of young trees, improve light quality in the fruiting zone, thin heavy fruit loads or remove water sprouts and other undesirable wood.

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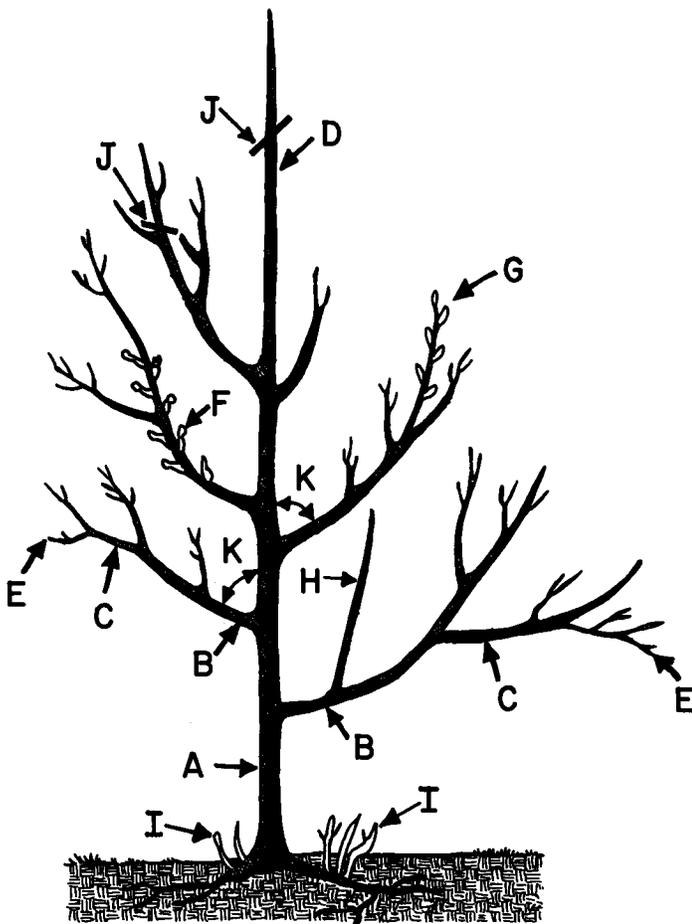


Figure 1. Fruit tree parts

Pruning Terms

Bearing tree – A fruit tree that has reached the stage of development to produce fruit annually.

Branch – A shoot that has developed to maturity and has passed through one or more dormant seasons (Figures 1B and 1C).

Bud – An undeveloped shoot or stem (Figure 1G).

Crotch, crotch angle – The angle between two branches near their point of origin (Figure 1K).

Fruit spurs – Short, thick growth upon which flowers and fruit develop (Figure 1F).

Heading back – Removing a portion of the terminal growth of a branch (Figure 1J).

Leader – A branch selected as a continuation of the trunk and from which scaffold branches develop (Figure 1D).

Scaffold branch – One of the lateral branches making up the basic framework of a tree (Figure 1B).

Secondary branch – A branch which develops from a scaffold branch (Figure 1C).

Shoot – New growth developing during the current season (Figure 1E).

Sucker – A rapidly growing shoot arising from a root or a larger branch (Figure 1I). A water sprout is a sucker growth that generally develops just below a major pruning cut.

Thinning out – The removal of a branch at the point of attachment. This may be removal of small wood (Figure 1H), or it may refer to a large branch or branches.

Trunk – The main stem or body of the tree (Figure 1A).

Pruning Non-Bearing Trees

Pruning and training are two of the most important cultural practices for managing fruit trees. Pruning is simply the removal of parts of the tree. Training is the direction of the growth of the tree into the desired form through pruning, limb spreaders or other means. A tree that is trained and pruned properly from the beginning develops a strong balanced framework which will hold a large fruit load.

Training or Choosing a Growth Form for the Tree

Methods used to train young fruit trees may either be a **central leader** or **open center**. Apple, apricot, cherry, pear and plum trees are generally pruned to the central leader method. The growth pattern of these trees is for the main stem of the tree to be dominant and the central leader training method promotes this characteristic. Peach and nectarine trees may be pruned to either a central leader or open center method since they do not have a strong tendency for one shoot or branch to dominate the growth of other shoots or branches. The open center is preferred as it increases yield and improves fruit quality.

Central Leader

This system has a central trunk from which the scaffold branches develop. The scaffold branches should:

- Form wide angles (crotch angle) with the trunk. About 60 to 80 degrees is best.

- Be distributed on different sides of the tree for good balance.
- Be spaced about 6 to 10 inches apart on the trunk with no branch directly opposite or below another.

Year of planting – Newly purchased trees are usually unbranched trees 4 to 5 feet high (whips). At planting they should be pruned to a height of 30 inches. This forces shoots to develop at desired levels (Figure 2). Some nursery trees have some limbs already developed (feathered trees). Three or four well-developed and well-placed lateral branches may be selected and the main leader cut off above the highest of these (Figure 3). Be sure that these branches have good crotch angles. If there are no branches that meet these requirements, cut them off and treat the tree as if it were a whip.

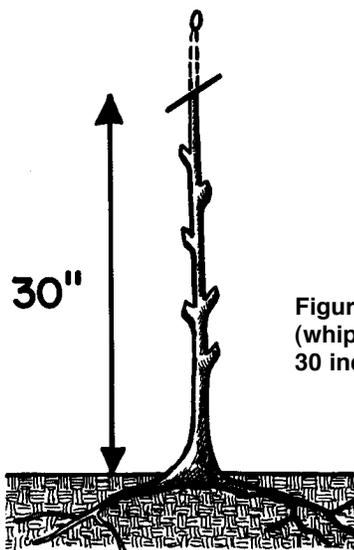
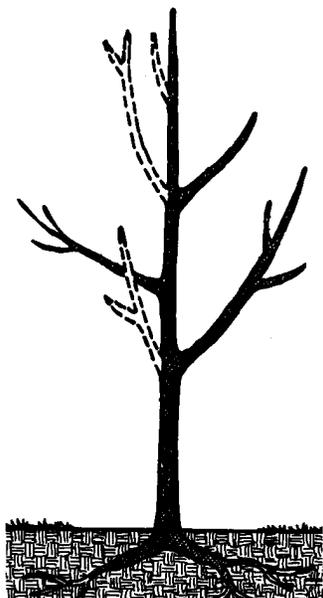


Figure 2. Unbranched trees (whips) should be cut to a 30 inch height at planting.

Figure 3. Branched trees should be pruned to 2 to 4 branches with wide angles and a leader. Other branches should be removed. (Broken lines show wood to be removed.)



Summer pruning and training may be used during this first year in order to develop well-placed scaffolds with good crotch angles. Use clothespins or toothpicks to increase the crotch angles of the selected scaffolds during the first growing season (Figure 4). After this time, limb position may be altered with spreaders, but crotch angles cannot be improved without risking splitting of the scaffolds.

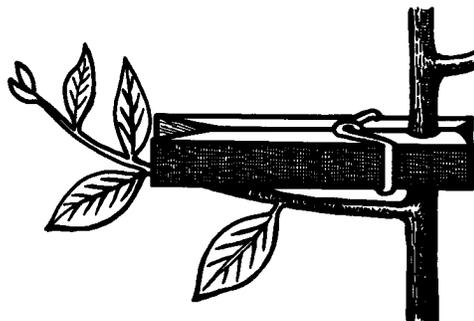


Figure 4. Obtain a wide crotch angle for scaffold limbs with a sharp toothpick or spring clothespin while the shoots are tender.

Dormant pruning, first season – Some selective pruning should be done at this time. Continue scaffold selections and assure balanced growth by topping back vigorous limbs so they have height equal to the weaker limbs. Thin out limbs which are narrow angled and weak. Those limbs which are too vigorous should be headed back.

- Select one of the most vigorous, upright growing branches for the leader.
- Select two to four branches that form wide angles with the trunk for permanent scaffold branches. They should be at least 6 inches apart and the lowest scaffold about 18 to 24 inches above the ground.
- Prune the central leader to about 18 to 24 inches above the top scaffold branch. Prune the scaffold branches at the ends so they are about 6 to 12 inches shorter than the leader.

Some additional tree training can be done during the spring and early summer, such as removing undesirable shoots as well as spreading scaffold limbs so they develop at a wide angle with the trunk.

Limbs can be spread by using lath or 3/4 inch by 3/4 inch square wooden pieces cut to proper lengths to spread limbs to wide angles with the trunk. The angles should be over 45 degrees and less than

90 degrees. Be careful not to split the branches at the point of attachment as you put the spreaders in place. Spreaders can be kept in position using four-penny nails driven into the ends of each spreader, then the nail heads are cut off at an angle and the nails pushed about 1/4 inch into the branches (Figure 5).

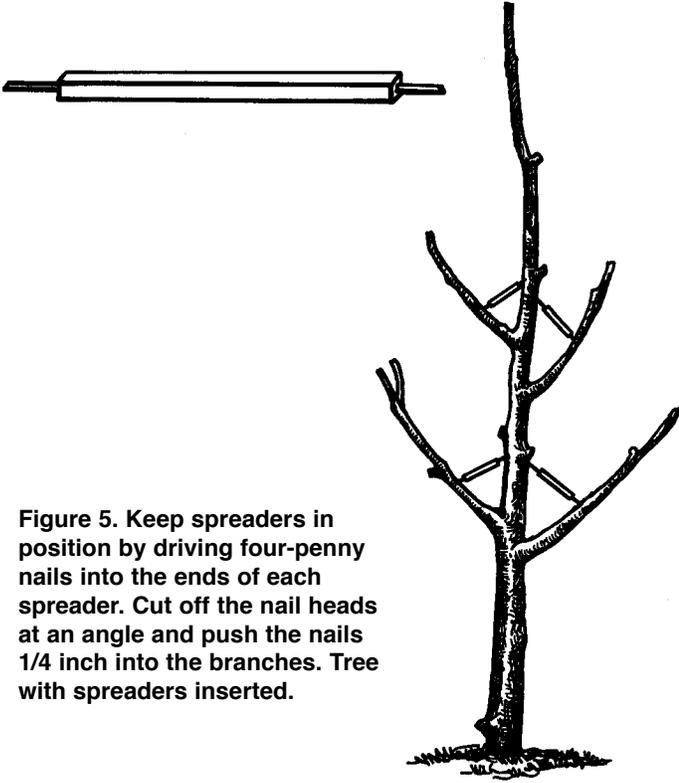


Figure 5. Keep spreaders in position by driving four-penny nails into the ends of each spreader. Cut off the nail heads at an angle and push the nails 1/4 inch into the branches. Tree with spreaders inserted.

Or a stake can be driven into the ground and a soft material such as cotton or hemp twine tied to the branch to pull it towards the stake and spread it (Figure 6). Generally, limbs should be spread for at least one growing season.

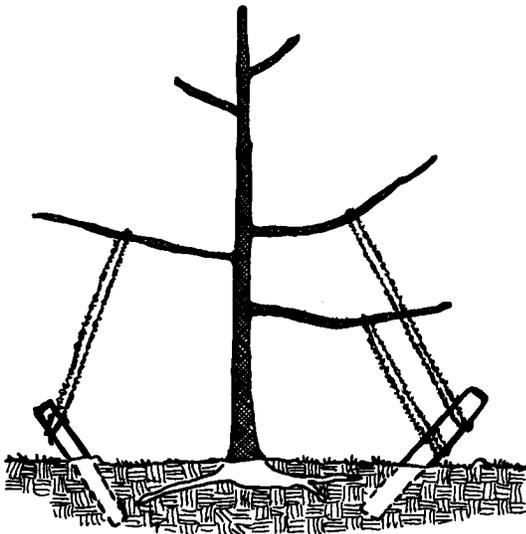


Figure 6. Drive a stake into the ground. Tie a soft material such as cotton or hemp twine to the branch to pull it towards the stake. Tie the material to the stake to spread the branch.

Dormant pruning, second year.

- Select a shoot to continue as the leader.
- Select two or three more shoots growing from the leader for more scaffold branches. Compare the length on them with the leader and prune them 6 to 12 inches shorter than the leader.
- Scaffold branches developed in previous seasons will have formed secondary shoots. On each scaffold, save two to four of these new shoots that are growing 6 inches or more away from the leader. Remove shoots that are growing upright or below the main scaffold. Be careful not to remove the spurs.
- Prune the scaffolds of the tree so they are in balance. Do not let lower branches outgrow the upper portions of the tree, nor the upper branches grow longer and “shade out” the lower ones.

Dormant pruning, third year – This pruning encourages formation of more framework and keeps a balance in the growth of scaffold branches. Two or three more scaffold branches can be chosen as in previous years. Keep the leader dominant by shortening competing branches. Remove branches that form narrow “crotches” and weak twiggy growth (Figure 7). Once again, be careful not to remove fruiting spurs.

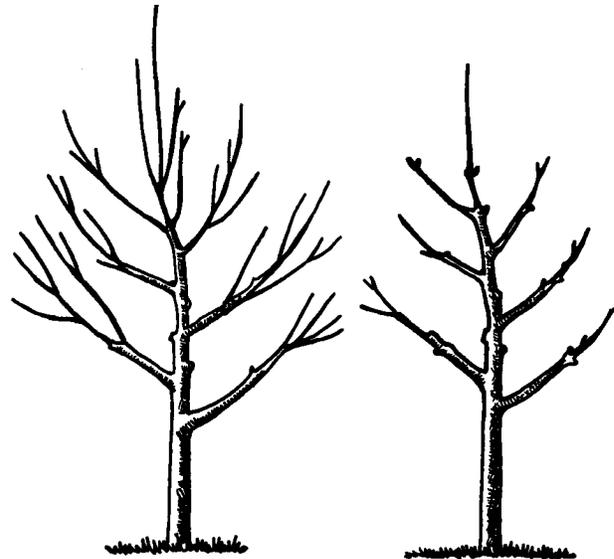


Figure 7. Cut out all competition for the leader and prune it high if the tree is vigorous; prune it low if the tree is growing weakly. Tip vigorous scaffolds to encourage weaker scaffolds. Leave all spurs.

Succeeding years – Maintain framework of tree to keep it in balance and ensure good light penetration into all parts of the tree. Tree shape should be primarily cone-shaped such as a Christmas tree – narrow at the top and wide at the bottom. Maintaining fruiting wood and spurs should be the foremost priority. Continue to thin out undesirable growth and any growth that is competing with the leader. Also, continue selective heading back cuts on the leader and vigorous scaffold limbs.

Open Center

Open center training has been described as an inverted umbrella without the handle. This type of system can have from two to five well-spaced scaffold limbs (Figure 8). Pruning to two scaffolds as shown in Figure 8A is used in high-density planting systems or in home environments of limited space. Keep in mind that per tree yield will be less due to smaller amount of fruiting wood. Pruning to two scaffolds as in Figure 8E is unsatisfactory as it results in an unbalanced tree.

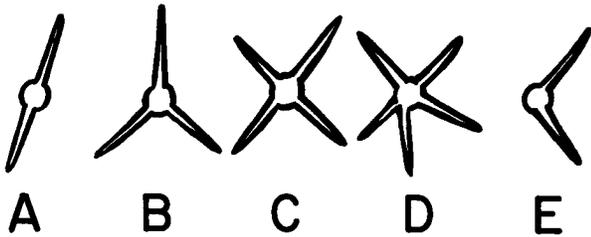


Figure 8. Scaffold or main limbs spacing, looking down on the trees; B, C and D are most satisfactory; A is difficult to train and E is unsatisfactory.

Year of planting – The initial pruning of the newly planted tree is as shown in Figure 9. Unless all desired scaffolds are present at planting (C), cut back all limbs almost to the trunk (B). Select the desired scaffolds the first summer and punch back all unwanted new shoots after they have reached 6 to 8 inches in length (Figure 10).

Dormant pruning, first year – Trim back uneven growth. Remove limbs not selected as scaffolds back to main trunk. Remove limbs growing upright or in the center of the tree. Encourage the main scaffold limbs to make continuous growth straight out from the trunk by making all scaffold limb cuts back to buds pointing outward directly above or under the limb.

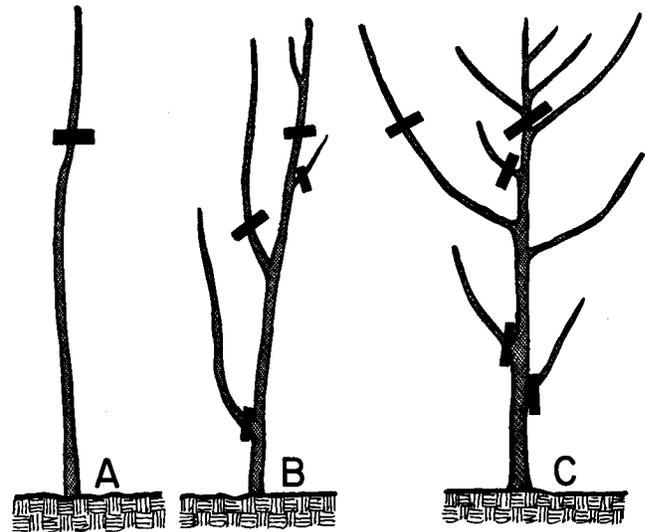


Figure 9. Newly planted tree: Cut off “whips” or stub side shoots to 1 inch (B); or when all desired scaffolds are present (C).

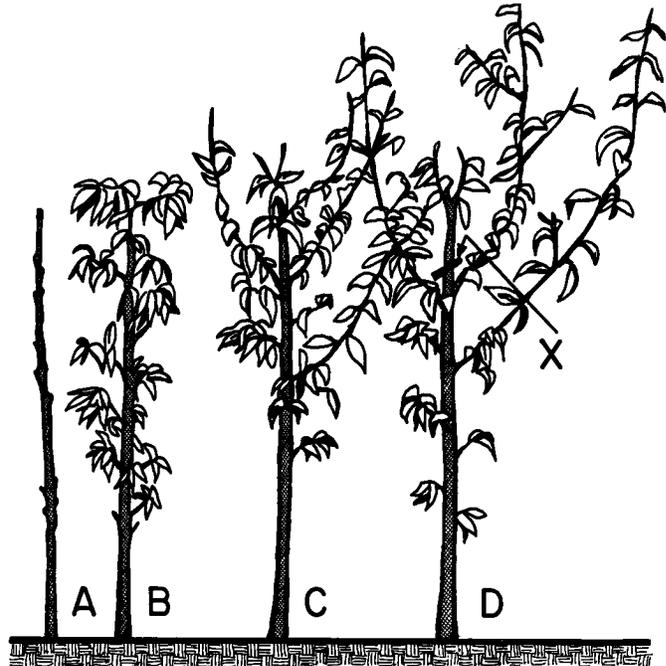


Figure 10. One-year-old tree: (A) headed back to 28 inches high and the lateral shoots cut back to a single bud; (B) three weeks after it started growing; (C) after branches for the framework of the top had been selected and the others cut off to leave one-half of their growth; (D) later in the summer after repeated pinching back of unneeded laterals.

Dormant pruning, second year – Continue to promote full extension of scaffold growth. Remove limbs growing straight up, down or underneath main scaffolds. Thin but do not completely remove upright growth in center of tree and head back remaining growth to 12 to 18 inches. Remove weak twiggy growth. See Figure 11.

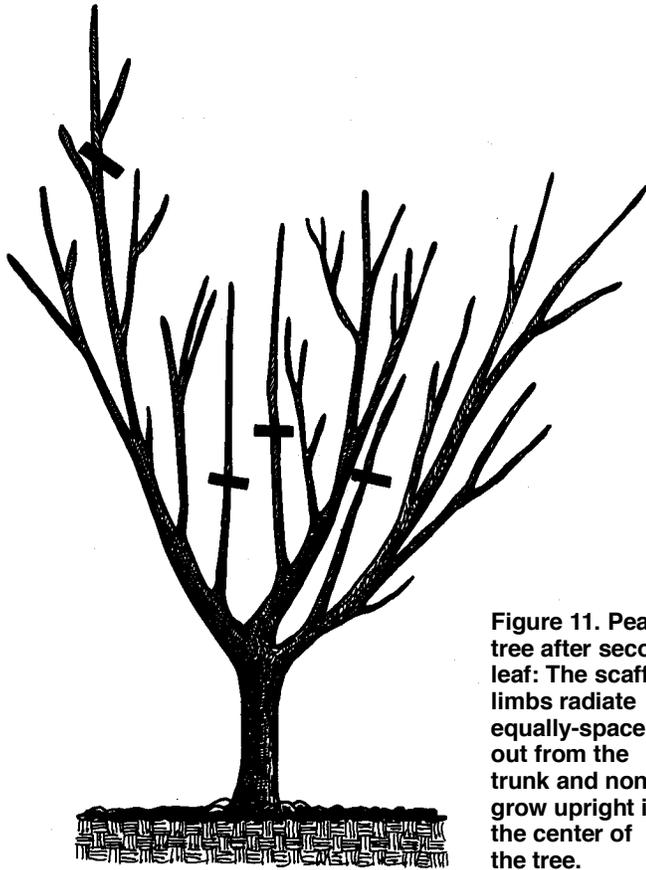


Figure 11. Peach tree after second leaf: The scaffold limbs radiate equally-spaced out from the trunk and none grow upright in the center of the tree.

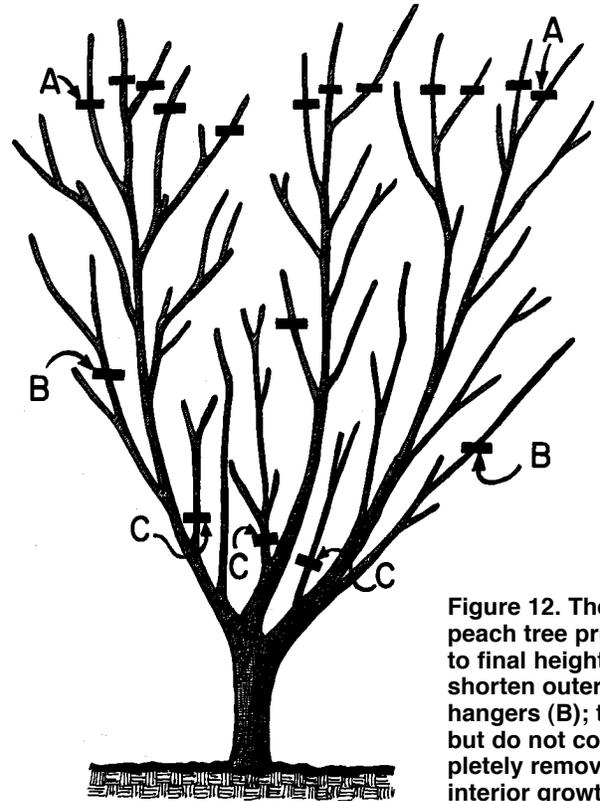


Figure 12. The peach tree pruned to final height (A); shorten outer hangers (B); thin but do not completely remove interior growth (C).

Dormant pruning, third year and beyond –

The final desired height for a peach tree is usually the height at which fruit can be picked from the ground without a stepladder. This is usually gauged by cutting off each year everything above “limb lopper height” (loppers extended at arm’s length above the head). When pruning along the scaffolds and subscaffolds of mature trees, remove a considerable portion of the shoots produced the past season. These shoots represent the fruiting wood for the current year, so do not remove all of the shoots. Retain shoots that are 12 to 18 inches long and evenly spaced throughout the scaffolds and subscaffolds. If the shoots exceed this length, cut a portion of them back to short shoots. Prune every year. See Figures 12 and 13 for diagrams.

Credit is given to Dr. R. Keith Striegler and Dr. W. Keith Patterson for work on this fact sheet. Both are former Extension horticulturists - fruit.

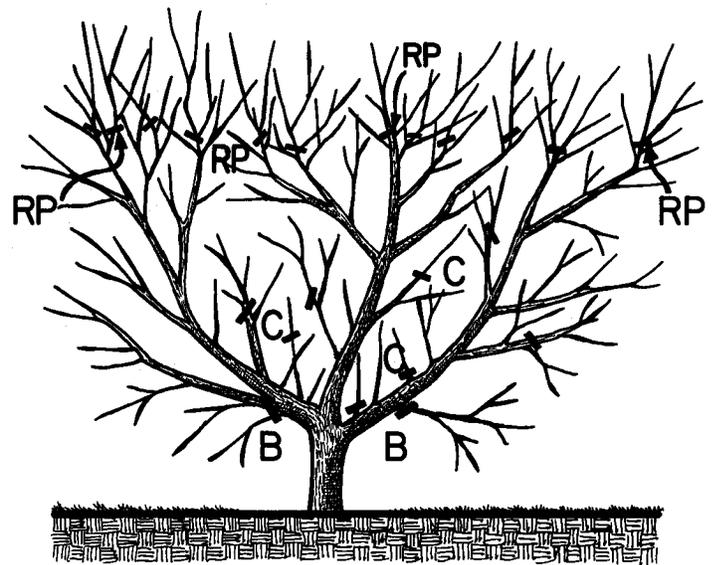


Figure 13. Prune peach tree to renewal points (RP) each year. Cut out older growth and most of previous season’s growth at each renewal point. Only a portion of the shoots from the previous year are needed to make a crop. Shorten out hangers (B). Thin interior (C) but do not remove all of it. Replace fruited out branches with year-old shoots each year.

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