PRUNING FRUIT TREES
IN HOME ORCHARDS
PRUNING FRUIT TREES IN HOME ORCHARDS

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Pruning is an essential practice wherever good fruit is grown and it requires a specific knowledge of the species to be pruned. This means that peaches and apples will be pruned differently.

There are two (2) phases of pruning fruit trees during its life span. The ‘pre-bearing phase’ the tree is pruned to give it a desired form and to develop a strong framework that will support the fruit in later years. During the ‘bearing phase’ pruning is required to keep the tree in a healthy condition and to produce fruit of high quality.

Young fruit trees should be pruned lightly. Too much pruning tends to dwarf the tree and slow down fruit bearing. A tree that is pruned heavily each year will be smaller, come into bearing later and bear smaller crops (at least for the first few years) than one that is pruned lightly.

Prune only enough to develop a strong framework of permanent branches.

TIME TO PRUNE  Prune in late winter or early spring before growth starts.

TOOLS NEEDED  Hand shears, long-handled loppers and pruning saw. Always keep tools sharp and clean.

MAKING THE CUTS

All cuts should be made with sharp tools correctly adjusted. These give clean, smooth cuts. In removing a branch, make the cut close to and parallel with the supporting limb. When heading back to a lateral, place the cut so it continues somewhat the line of direction of the lateral branch. Stubs do not heal and may start decay. If the cut is too close to the point of lateral attachment, the branch is likely to split out.

In using shears, place the blade against the supporting limb to allow for a smooth, close cut. The cut can be made easier by pushing slightly downward on the branch in the direction the cut is being made. Never wiggle the shears through a cut, as this makes a ragged wound that will heal slowly, and may spring the shears.
HEADING BACK CUT

**Left,** the heading back cut forced several buds below it into vigorous growth. A number of such cuts can result in a very thick tree with much unproductive wood.

**Right,** when a condition develops as shown at left, prune out laterals with narrow crotches. Leave only 2 or 3 well-shaped branches as shown here.

This illustration shows the cut above the lateral was improperly made and left too high a stub. Dotted line represents angle and position at which cut should have been made.

Wide crotch angles insure strength. The angle of the crotch on the left is wide. Note relative thickness of the 6 successive layers of wood laid down by the cambium in this crotch angle. At right, angle at the crotch is narrow. Bark in the crotch angle comes together before the crotch is filled with woody tissue. This prevents union and encourages decay. A narrow crotch is weak, splits with overloads, and is often associated with winter injury on adjacent bark.

PRUNING AT PLANTING TIME

Roots of nursery trees are trimmed back considerably when trees are dug, and some roots may be injured during handling. Before planting, prune injured roots back to sound wood, and prune long roots back so they fit in the planting hole without bending.

After the tree is planted, reduce the top growth of the tree so it is in balance with the reduced root growth. Prune the top of whips (unbranched trees) at about 30 inches above the ground.
Branched trees should also be cut back to about 30 inches high. Prune the selected branches back about one-half and remove the branches that form narrow angles with the trunk and are too close to selected branches. The lowest branch should be about 18-24 inches above the ground level for standard size trees and somewhat lower for dwarf trees.

**WOUND DRESSING**

There is no particular advantage in applying a dressing to wounds under 2 inches in diameter. A wound dressing applied to larger wounds aids in the healing process. The preferred wound dressing has an asphalt base, although others may be used. Paints with lead or zinc are satisfactory. Wound dressings containing bordeaux mixture may injure the cambium and interfere with natural healing processes. The same is true of creosote paints.

**METHODS OF TRAINING**

Young fruit trees are trained either by (1) the open center or (2) the modified leader method. Fruits pruned to modified leader method are: apples, pears, cherries, and apricots. Peaches, nectarines, and Japanese plum are pruned to the open center method.

**OPEN CENTER METHOD**

The purpose of the open center method is to allow sunlight to penetrate the interior portion of the tree and to develop strong branches to support a large crop of fruit for peach and plum.
Steps in training a tree to the open center method are listed below and are illustrated with the first three (3) figures on the following pages.

FIRST PRUNING  (Figure 1)

1. Head back the one-year-old tree to 18-24 inches at planting time.

2. Choose three (3) scaffold branches that are well arranged around the trunk and that are as near as possible to the place where the tree was headed back (Top View). If the branches are large and uniform in size, you can leave them 10 to 12 inches long. If slender and uneven in size, cut them back to short stubs with one or two buds. Choose shoots which develop from these buds for the main branches.

SECOND PRUNING  (Figure 2)

1. In the spring of the second year, remove any shoots other than those you have chosen to make the framework. Head the three (3) main branches to equal lengths so they will grow to be as near the same size as possible. Remove water sprouts and low hanging branches.

2. Follow the rules for the second pruning until the tree achieves the age of four (4) years. Small fruiting wood in the interior portion of the tree can be retained for additional fruit until the tree reaches the bearing phase at which time it should be removed.
Top View

Before

30"

After

First Pruning
Figure 1

Second Pruning
Figure 2

Pruning the Mature Tree
Figure 3

Open Center Method
MODIFIED LEADER METHOD

FIRST PRUNING

First pruning at the time of planting, head or cut back large one-year-old-unbranched trees to 3-1/2 to 4 feet above the ground. Trees 3-1/2 feet or less in height need no heading back.

SECOND PRUNING (Figure 4)

Second pruning – in the spring, a year after planting. This is the first pruning of the two-year-old-nursery tree when planted.

1. Save one of the most vigorous upright-growing shoots for a leader.

2. Select for permanent branches (1) or more (preferable two) well placed branches that form wide angles with the trunk. The lowest branches should be 20 to 24 inches above the ground. Keep the side branches 6 inches or more apart.

3. Head back the leader to about 20 inches above the top permanent branch. Shorten the laterals so that when you hold them up their tips will be 6 inches lower than the tip of the leader.

THIRD PRUNING (Figure 5)

Third pruning – two (2) years after planting.

1. Select the highest shoot developed from the leader the previous season to continue as the leader.

2. Save two (2) or three (3) lateral shoots from the leader for more permanent branches. Head them back if need be, to keep the leader dominant.

3. During the previous season the branches saved for scaffolds will have rebranched, forming secondary shoots or laterals. On each permanent branch, save two (2) or three (3) of these laterals that are 6 inches or more always from the leader. Remove or head back any that are longer than the leader or midrib of the main scaffold branch. Treat each permanent branch as though it were a young tree.
4. Leave the several parts of the tree in balance. Do not let the lower branches outgrow the upper portions of the tree, nor the upper branches grow longer and “shade out” the lower ones.

5. Save short twigs and spurs that develop in the inside part of the tree. If these grow into vigorous shoot that tend to make the center of the tree thick and bushy, you can thin them out a year later.

FOURTH PRUNING (Figure 6)

Fourth pruning – three (3) years after planting. This pruning should encourage formation of more framework and keep a proper relationship among the present scaffolds. Choose two (2) or three (3) more permanent branches as described for the third pruning. Keep the leader dominant. Correct any tendencies to develop weak crotches. Save short twigs and spurs. If opposite branching occurs on the trunk or along the main branches, remove the poorer one.

FIFTH PRUNING (Figure 7)

Fifth pruning – four (4) years after planting. By this time, the main framework of four (4) to six (6) scaffolds will be set up and you will not need to encourage the further development of the leader. Do not, however, head back the leader at this time. If necessary, you can cut it back to a well-placed, outward-growing lateral one (1) or two (2) years later. Most varieties need no heading back and very little thinning out until after the trees are in full bearing.

Head back or tip new growth until the limbs are about four years old.
Modified Leader System
Mature Trees of Several Species Following Pruning

Apple

Apricot

Peach

Pear

Plum
PRUNING BEARING FRUIT TREES

APPLE: Most of the fruit is borne at the ends of short spurs that form on the branches that are two years old or more.

Do not remove spurs. Remove all dead wood and branches which are rubbing together. New growth should be thinned to encourage new spur development by allowing sunlight to penetrate into the tree. Note Figure 7 as to how thinning should be accomplished. When making a cut, divert the growth toward the outer portion of the tree. Prune annually.

PEAR: The fruit is borne on spurs carried by wood that is two years old or more. The bearing trees need little pruning except to thin out the center portion of the tree. Make cuts inside to divert the growth to outside growing points. Since the pear has upright growth, this can be accomplished with little problem. This should be done annually.

APRICOT: The apricot produces most of its fruit on rather short-lived spurs. The principal problem is to remove branches with old spurs and keep the trees producing good replacement wood. All new growth should be headed back by ½ or more to encourage the new growth required to aid in the development of new spurs. Prune annually.

PEACH AND NECTARINE: The fruit is borne on the previous year’s growth and new fruiting wood must be produced each year. Heavy annual pruning is the rule for peach and nectarine. Remove about ½ of last year’s growth by heading back. Make sure that limbs which are retained are forced outward (See Figure 7 for illustration on pruning). If numerous laterals are produced from heading back, thin to one (1) or two (2). While the center of the tree should remain open, it is not advisable to strip the center of all bearing wood. Prune annually.

PLUM: Fruit are borne on spurs of two years old or older. Therefore, spurs should not be removed except when potential fruit thinning is desired. Thin out about 1/3 of previous season’s growth and shoots on interior portion of tree. Prune annually.

QUINCE: Quince fruits are borne terminally on short shoots that arise from terminal or lateral buds formed on previous year’s growth. The quince is best pruned by thinning out process. The degree of pruning should be light. Prune annually.
**SWEET CHERRY:** The primary objective is to remove dead, broken and weak branches. Head back branches to help develop new fruiting wood near the center of the tree. Tree requires light annual pruning.

**SOUR CHERRY:** The sour cherry tends to produce a dense top which requires thinning-out cuts in order to keep the trees open. The trees have a spur bearing habit so do not remove too many spurs when pruning. Prune annually.

### POSITION OF FRUIT BUDS

<table>
<thead>
<tr>
<th>NAME</th>
<th>HABIT</th>
<th>TRAINING</th>
<th>ANNUAL SHOOTS</th>
<th>SPURS</th>
<th>PRODUCTIVE LIFE OF SPUR</th>
<th>PRUNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>Spreading</td>
<td>Modified leader</td>
<td>Some</td>
<td>Most</td>
<td>5 years</td>
<td>Very light</td>
</tr>
<tr>
<td>Apricot</td>
<td>Upright, spreading, vigorous</td>
<td>Modified leader</td>
<td>Some</td>
<td>Most</td>
<td>3-4 years</td>
<td>Heavy</td>
</tr>
<tr>
<td>Nectarine</td>
<td>Upright, spreading</td>
<td>Open center</td>
<td>Most</td>
<td>Some</td>
<td>-----</td>
<td>Very heavy</td>
</tr>
<tr>
<td>Peach</td>
<td>Upright, spreading</td>
<td>Open center</td>
<td>Most</td>
<td>Some</td>
<td>-----</td>
<td>Very heavy</td>
</tr>
<tr>
<td>Pear</td>
<td>Various</td>
<td>Modified leader</td>
<td>Some</td>
<td>Most</td>
<td>10-12 years</td>
<td>Very light</td>
</tr>
<tr>
<td>Plum (Japanese)</td>
<td>Various</td>
<td>Open or delayed open</td>
<td>Some</td>
<td>Most</td>
<td>6-8 years</td>
<td>Heavy thinning</td>
</tr>
<tr>
<td>Cherry, tart</td>
<td>Spreading</td>
<td>Modified leader</td>
<td>Some</td>
<td>Most</td>
<td>3-5 years</td>
<td>Very light</td>
</tr>
<tr>
<td>Cherry, sweet</td>
<td>Upright, spreading</td>
<td>Modified leader</td>
<td>Some</td>
<td>Most</td>
<td>3-5 years</td>
<td>Very light</td>
</tr>
<tr>
<td>Pecan</td>
<td>Upright</td>
<td>Modified leader</td>
<td>All</td>
<td>-</td>
<td>-----</td>
<td>Very light</td>
</tr>
<tr>
<td>Persimmon</td>
<td>Spreading</td>
<td>Modified leader</td>
<td>All</td>
<td>-</td>
<td>-----</td>
<td>Light thinning</td>
</tr>
<tr>
<td>Plum, (European)</td>
<td>Upright</td>
<td>Modified leader</td>
<td>Some</td>
<td>Most</td>
<td>6-8 years</td>
<td>Light thinning</td>
</tr>
<tr>
<td>Quince</td>
<td>Spreading</td>
<td>Open center</td>
<td>All</td>
<td>-</td>
<td>-----</td>
<td>Light thinning</td>
</tr>
<tr>
<td>Walnut</td>
<td>Upright</td>
<td>Modified leader</td>
<td>All</td>
<td>-</td>
<td>-----</td>
<td>Light thinning</td>
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</tbody>
</table>
OLD UNPRUNED TREES

Fruit trees in the backyard are many times neglected in regard to pruning. The trees are low in vigor and produce few fruit. If this is the case they should be headed back to old wood to rejuvenate new productive wood. Steps to take in rejuvenating these trees include:

1. Make a few large pruning cuts. Usually this procedure is more effective than many small cuts as the elimination of one or two large, misplaced limbs in the center opens up the tree and gives it an entirely new look.
2. In reducing tree height and opening up the top branches, follow the same principle – a few heavy cuts rather than many small ones.

These operations tend to stimulate tree growth and usually heavy vegetative growth develops. These branches may be removed during the summer months or in the following dormant pruning.

Usually two or three years are required to rejuvenate neglected trees. Keep the tree open so light penetrates to the center of the tree. This helps promote fruit bud formation on the new interior shoots. Continue to head back and thin out the top of the trees, gradually elevating the old tops as the new branches begin to take over.

Old unpruned fruit tree should have the four large branches removed by saw cuts at the four points show by arrows.

Same tree as above after the four large pruning cuts. Note how open the tree is now, encouraging the formation of new, vigorous, replacement branches in the lower portion of the tree. The points where the unwanted branches were removed are shown in the Figure.
Unpruned upper portion of tree, indicating the branches that should be removed.

Points show where branches were removed when thinning and heading were made.

**PRUNING DWARF OR SEMI-DWARF TREES**

The dwarfs should be trained identical to the standard trees. They will begin fruiting at an earlier age than standard trees which creates a dwarfing effect. Generally a light thinning is the best method for dwarf trees.

**Caution:** These trees will need annual pruning or the dwarfing effect may be lost. This is especially true for apple and pear.

**PRUNING TERMS**

1. **Bearing tree** – a fruit tree that has reached the age of capable producing fruits annually.

2. **Branch** – a shoot that has developed to maturity and has passed through one or more dormant seasons.
3. **Bud** – the initial of an unelongated branch or tip of a shoot. A bud may develop into leaves or a vegetable shoot, or into flowers and their subtending parts. It may be terminal as at the end of a branch or shoot, or lateral as in the axil of a leaf.

4. **Bud Union** – the point of attachment between the scion cultivar and the stock or rootstock upon which it is budded or grafted.

5. **Crotch, crotch angle** – the angle between two contingent shoots or branches near the point of their union.

6. **Cultivar** – a term that is now used in place of the older term, variety, when designating a specific horticultural variation in a plant species.

7. **Deshooting** – the practice of removing young shoots from a tree or other plant during the growing season for the purpose of aiding in the training of the plant.

8. **Disbudding** – the removal of dormant buds, a practice sometimes followed on newly planted or young trees in the selection of buds for development into scaffold branches.

9. **Dwarf trees** – generally, a cultivator that has been propagated on a size controlling rootstock, as Malling IX, in the case of an apple or quince and produces a small sized tree.

10. **Espalier** – a wall or framework upon which a tree or other plant may be trained; or, the shape to which a plant is trained to be more or less picturesque as well as productive.

11. **Fruiting wood** – branches of a tree or other plant carrying flower buds and the potential for bearing fruit.

12. **Growth regulator** – a chemical substance that may inhibit or accelerate vegetative growth, or may affect the initiation of floral or vegetative buds, or in some way may alter the normal growth habit of the plant; the substance may occur naturally in plants or it may be formulated and applied to plants for the purpose of producing desired effects upon growth habits.

13. **Heading** – usually refers to cutting away a portion of the terminal growth of a branch; it may be an upright branch or one growing laterally.
14. **Hedging** – a term applied to pruning by mechanical devices which cut away, in bulk fashion, portions of the tops and sides of trees.

15. **Malling rootstocks** – a group of rootstocks classified at the East Malling Research Station in England so that they represent various degrees of size control of the trees of cultivars propagated on them.

16. **Old wood** – in pruning, this refers to branches that have been productive or bearing for a number of years, generally for more than 5 or 6.

17. **One-year wood** – wood or branches that were produced by the previous season’s growth; a term generally used during the dormant pruning season.

18. **Pome fruit** – fruits are classified into specific types according to structure; the pome fruits are all similar in structure, although appearances may be quite different, are represented by the apple, pear, and quince.

19. **Rootstock** – the root system and portion of attached stem upon which another plant part is propagated (budded or grafted).

20. **Scaffold branch** – one of the branches comprising the basic framework of a tree or other plant; primary scaffolds are those arising directly from the main trunk of the tree.

21. **Semi-dwarf tree** – a cultivar which has been propagated upon a specific size controlling rootstock that produces a mature tree somewhat smaller than a standard tree and somewhat larger than a dwarf tree; rootstocks most often used for this purpose are Malling VII and II, Malling Merton 106, 104, and 111.

22. **Shoot** – vegetative growth produced from a dormant bud which possesses leaves; generally, the growth developing during a current season.

23. **Spreader** – a short piece of wood or metal used to insert between a lateral branch and the main trunk of a young tree for purposes of producing a more horizontal growth habit of the branches.

24. **Spur** – short, thick growth upon which flowers and fruits are born, typically on most apple, apricot, cherry and pear trees.

25. **Spur type tree** – most often used in reference to recent mutations of certain apple cultivars that produce fruiting spurs earlier in the life of the tree and more abundant per foot of branch-growth.
26. **Standard tree** – commonly refers to a tree that has been propagated by grafting or budding a cultivar on a seedling rootstock.

27. **Stone fruit** – a specific type of fruit classified according to structure; refers primarily to peaches, plums, apricots, cherries and similar fruits with a stony layer surrounding the seed.

28. **Sucker** – a rapidly growing shoot arising from a larger branch, usually from a latent bud; also refers to shoots arising from the rootstock below the bed or graft union.

29. **Thin wood** – refers to branches of rather small diameter in relation to overall length; these usually develop in the more shaded portions of a tree and from the lower sides of larger branches and are generally unfruitful or produce small, poorly colored fruits.

30. **Thinning out** – refers to the removal of branches in a portion of the tree or throughout the tree or other plant for purposes of permitting greater light and spray penetration into all areas of the plant.

31. **Water sprout** – a term applied to vigorous, succulent shoots arising indiscriminately and generally on the larger branches of a tree; they are often produced in large numbers just below a pruning cut.

32. **Whip** – a single, unbranched shoot that has developed from budding or grafting a cultivar on a rootstock and grown one year in the nursery row.

33. **Wound** – the cut surface remaining on the plant where a branch has been removed by pruning; it may also refer to any other open surface on the plant.

34. **Wound dressing** – a proprietary compound especially made for treating cut surfaces on plants for purposes of reducing the drying of the exposed plant tissues and protecting the open areas from invasion by infectious organisms.
Pruning Terminology: Plant Framework