

Training and pruning your home orchard

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The basics

Why train fruit trees?

- Training develops a strong tree structure that can support heavy crops without limb breakage.
- Training helps bring a young tree into production at an early age.

Why prune fruit and nut trees?

- Pruning reduces overall tree size, keeping them small enough to safely manage in the garden.
- Pruning makes trees easier to spray and harvest.
- Pruning young trees can improve structural strength and induce branching.
- Pruning mature trees can increase their production and improve fruit quality.
- Pruning reduces the need to prop up fruit-laden branches.

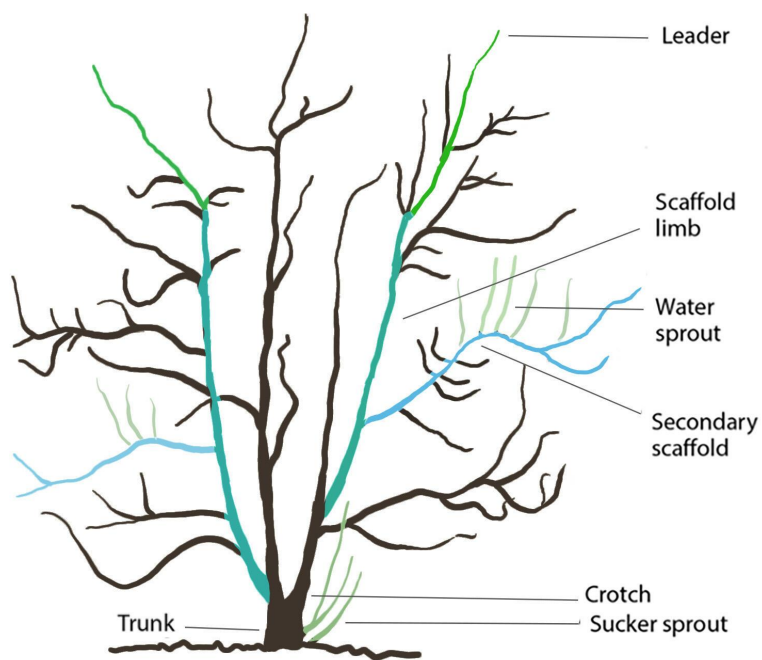


Figure 1. Common terms used in pruning and training fruit trees.

Credit: Page Biersdorff, © Oregon State University

Basic terminology

Branch collar — The raised tissue at the base of every branch. It contains specialized cells that seal off pruning wounds from wood rot fungi. Pruning to the branch collar makes it unnecessary to apply wound dressings.

Crotch angle — The angle formed between the trunk and a limb. The strongest crotch angle is 45–60 degrees.

Crown — The base of the trunk where the tree meets the soil.

Heading (or head cut) — A pruning cut that removes only part of a branch at some point along its length.

Lateral branch — A side shoot off of another branch, usually at a more horizontal angle.

Leader — The uppermost portion of a scaffold limb. In a central-leader-trained tree, only one leader is left in the center of the tree. Multiple-leader-trained trees usually have three to five leaders per tree.

Scaffold limb — A large limb that forms the framework of a tree.

Shoot — The length of branch growth in one season. The bud scale scars (ring of small ridges) on a branch mark the start of a season's growth. The terminal bud marks the end.

Spur — A short shoot that produces flowers and fruits.

Stub — A short portion of a branch left after a pruning cut. Avoid leaving stubs.

Sucker sprout — A 1-year-old shoot that grows from the root.

Terminal — The end of any shoot.

Thinning cut — A pruning cut that removes an entire branch from its point of origin.

Vertical branch — A branch that grows upright.

Water sprout — A 1-year-old shoot that grows within the tree.

Save the branch collar, and don't use wound dressings

Prune so that you don't leave a stub (Figure 2), and also so that you don't make a wound larger than necessary (as occurs with a "flush cut," line A). Cut just outside the branch collar (line B, the raised tissue at the base of every branch). Its specialized cells seal off pruning wounds from wood rot fungi.

See the video [Pruning with the pros — collars and ridges](https://www.youtube.com/watch?v=LdojKLVOM2c).

(<https://www.youtube.com/watch?v=LdojKLVOM2c>)

There's no clear evidence that wound dressings reduce wood rots in pruning wounds. Early tree training helps you avoid large pruning wounds low in the tree, which might become infected.

General rules for training

- Start training at planting time.
- Remove unwanted shoots in summer when they're small. If they are very small, green and flexible, you can often snap them off, rather than snip them.
- Train more by limb positioning than by pruning. Use spacers and tying to position existing limbs.
- Follow the training program consistently, as often as necessary, so that you complete proper training as soon as possible.

Manage your fruit trees actively

The best way to control the height of a fruit tree is to plant a dwarfing rootstock, if available. You can also control tree height through pruning or by using a trellis system. Keeping the tree's height low allows for easier harvesting and pest management. For safety, keep the height to the point where you can do all tree care and harvest from the ground, or at most from a short ladder.

You may have inherited fruit trees on your property from previous residents. You can either choose to manage them or replace them with a cultivar, rootstock or training system that controls the overall height of the tree. A post-and-wire trellis system is a popular way to keep fruit trees at a manageable height (see "Espalier training").

Untended fruit trees can become infestation sites for serious insect pests and disease. Untended trees may also attract wasps to unpicked, overripe fruit and can make it difficult for commercial growers in the region to control key pests. If you use an untended fruit tree mostly for shade, consider replacing it with a nonfruiting shade tree.

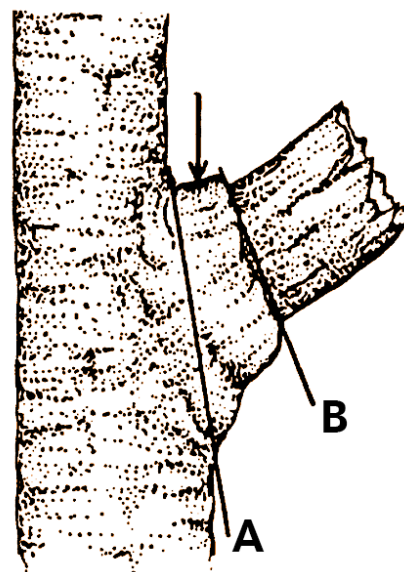


Figure 2. Always preserve the branch collar (at arrow), the raised tissue at the base of every branch. The branch collar contains specialized cells that allow a tree to seal off pruning wounds and prevent rot from damaging the branch's heartwood. Make your pruning cut at an equal and opposite angle from the branch bark ridge.

Credit: © Oregon State University

General rules for pruning

- Prune all fruit and nut trees at planting time to remove any broken or weak (thin, short) shoots.
- Prune young trees lightly to preserve as much leaf area on existing branching as possible to encourage root growth and overall establishment of the tree.
- Prune mature trees more heavily, especially if they've shown little growth. However, if the trees are not producing vigorous growth each year, ensure the growing conditions are suitable. Trees should receive at least six hours of sun, soil drainage should be good, and the trees should be adequately watered and fertilized.
- Prune the top portion of the tree more heavily than the lower portion.
- Prune when all danger from fall or early winter freeze has passed but before growth begins in spring. Sweet cherry trees may be pruned in August when there's less risk of bacterial infection.
- In a mature tree, thin out more of the shoots that grow toward the end of a well-pruned branch. This increases fruit size and quality on the remaining shoots (Figure 3B).
- To reduce the height of a tree that's too tall, cut limbs at the top of the tree to a lateral branch that is the height you desire (Figure 4). When removing a branch, cut to the branch collar and don't leave stubs of the former branch. Stubs won't heal and could be a starting point for wood rot fungi.
- Thinning out and heading back (Figure 3A). Thinning out results in long, flexible limbs that bend down when loaded with fruit. Prevent this by heading back long branches, which causes limbs to branch laterally and stiffen. On young trees, light heading stimulates branching by encouraging shoot growth below the point where you cut..
- Bend nearly vertical limbs 45–60 degrees from vertical to stimulate fruit production earlier in the life of the tree. Bend limbs to the desired angle and secure them in place with weights, tying them with twine or using notched limb spreaders in the crotch of the branch. Keep the bent limb in the desired position for one growing season. This allows the branch to produce new wood and stiffen and stay at that angle. Take care to bend, but not break the branch. The thicker and more upright a limb is, the more benefit it receives from bending. Bending helps keep a tree small and manageable by channeling the tree's resources into fruit instead of shoot growth.



Figure 3A. Thinning out (left) and heading back or "stubbing" (right).

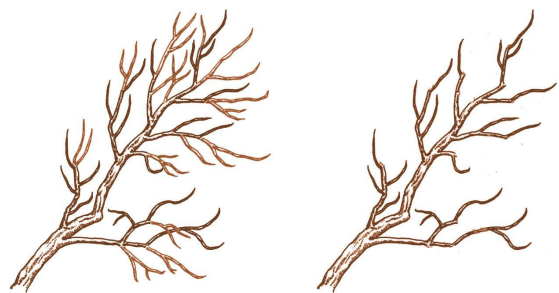


Figure 3B. On this well-pruned branch, thin out more shoots toward the end (lighter shades).



Figure 4. This tree is too tall. To reduce its height, cut out whole limbs at the top (lighter shade).

Credit: Page Biersdorff, © Oregon State University

Tree training systems

Open-center training

To train trees to an open center (Figure 5), choose three or four shoots to form main scaffold branches the first winter. Remove other shoots that might form competing limbs. Or, head them by removing one-fourth to one-third of their length if they're long and not branched.

When you remove large limbs, first cut partway through the branch on the underside, then make the top cut. This will prevent the bark from tearing below your cut as the branch falls from the tree. As noted, don't leave stubs. See the video [Pruning with the pros — thinning the canopy of a crabapple tree.](https://www.youtube.com/watch?v=weLBOTYq5ts&t=1s) (<https://www.youtube.com/watch?v=weLBOTYq5ts&t=1s>)

To keep a tree small, prune moderately each year and don't apply excessive fertilizer, manure or compost.

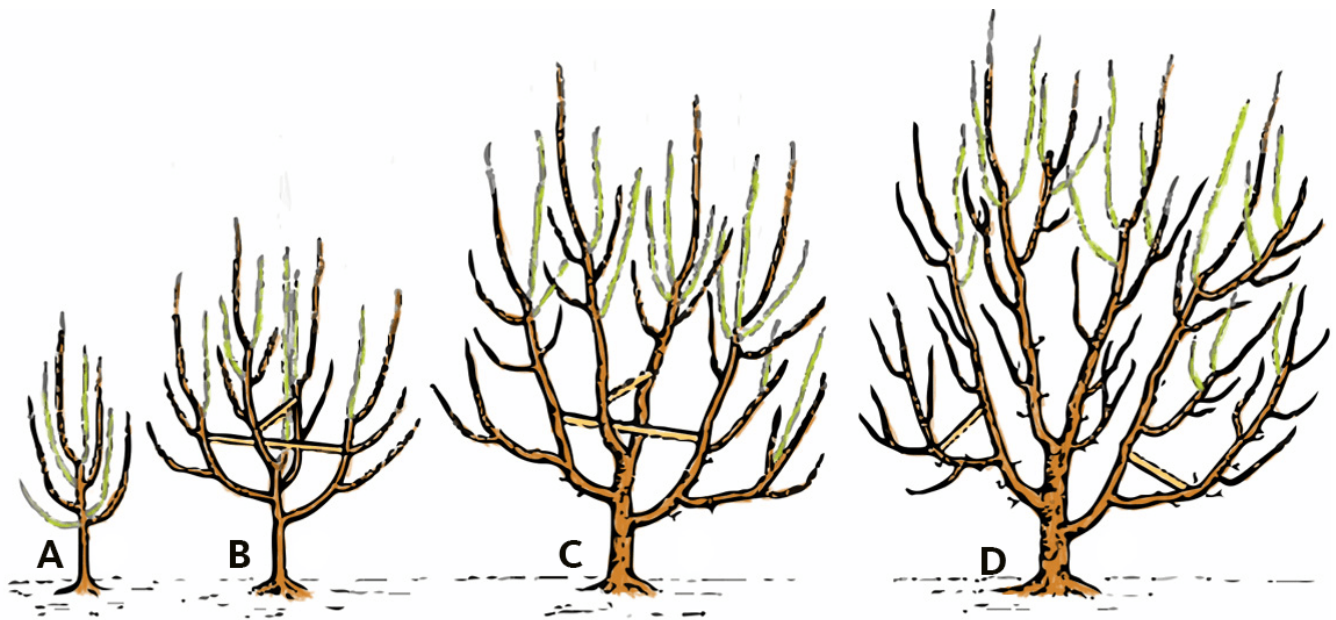


Figure 5, open-center training. It takes four winters to train trees to an open center. (Lighter shade indicates removed or headed shoots).

- **A:** The first winter, choose three or four shoots to form main scaffold branches. Remove or severely head all others. Scaffold branches should be at least 8 inches apart on the trunk for a strong tree structure.
- **B:** The second winter, choose one or two more.
- **C:** By the third winter, scaffold selection should be complete.
- **D:** The fourth winter shows a good, open center. Four main scaffold limbs evenly distributed around the trunk are enough; a fifth limb crowds.

Credit: Page Biersdorff, © Oregon State University

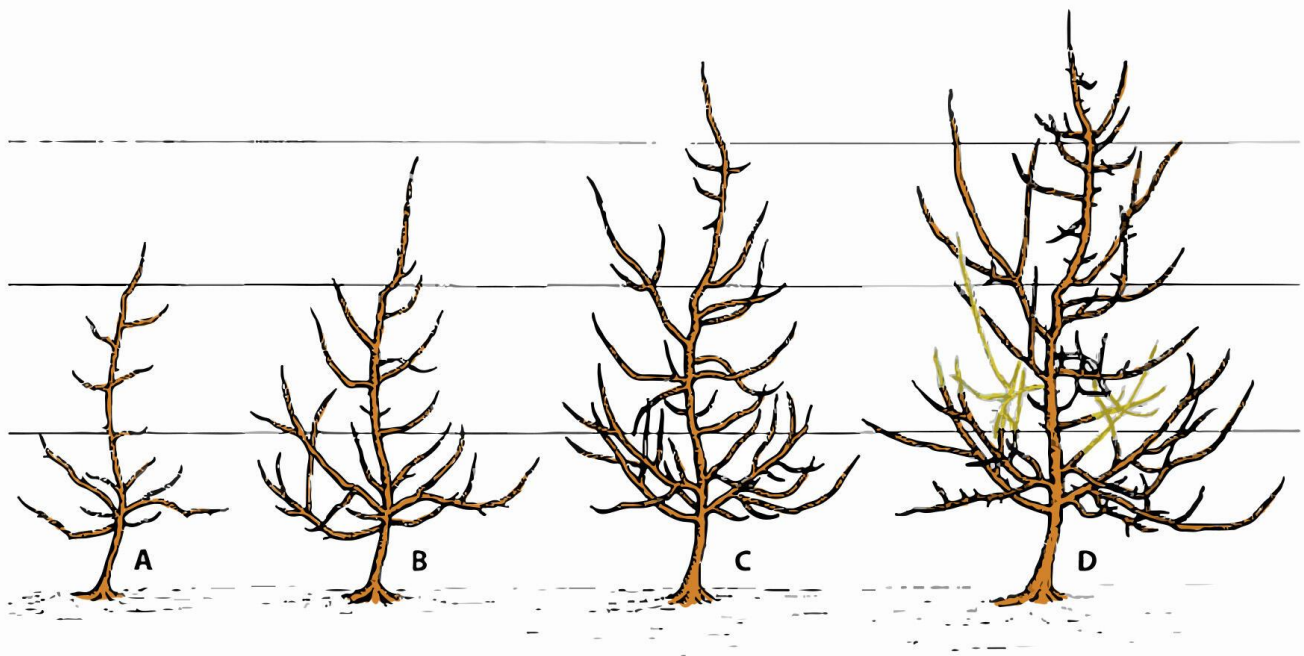


Figure 6, central-leader training. Training trees to a central leader takes four winters. (Lighter shade indicates removed or headed shoots).

- **A:** The first winter after planting, choose a vigorous shoot high on the tree. Cut off the top to stimulate branching if it's 2 feet long or longer. Head all other vigorous shoots more severely.
- **B, C and D:** Repeat the process the following three winters so that no side branches become vigorous enough to compete with the central leader.

Central-leader training

If a nursery tree has few or no branches at planting, head it at 24–30 inches above ground. To train trees to a central leader (Figure 6), choose a vigorous shoot to be the leader near the center of the tree after planting.

During spring or early summer, remove shoots near the leader that will compete with it because of their upright aspect and vigor (Figure 7). In the following dormant season, head the leader by one-third, and tie down (or remove) competing shoots.

Each year, spread limbs that are too upright (Figure 8). Repeat the process in the following two seasons, so that no side branches become vigorous enough to compete with the central leader.

Some dwarf apple varieties (such as Liberty, shown in Figure 6) have wide-angled limbs naturally and don't need heading or spreading if they're supported. Delicious, Newton and other varieties with narrow crotches or upright limbs do require spreading. The central leaders of nonsupported trees need annual heading to develop short, stout limbs.

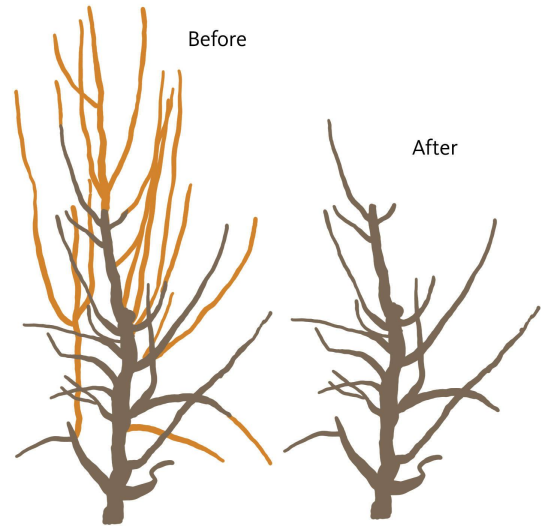


Figure 7. The highest portion of a scaffold limb is called the leader. Thin it to an upright side shoot. Head that shoot and remove all upright shoots that might compete. To avoid overgrowth in the tree top, repeat this process annually.

Credit: Page Biersdorff, © Oregon State University

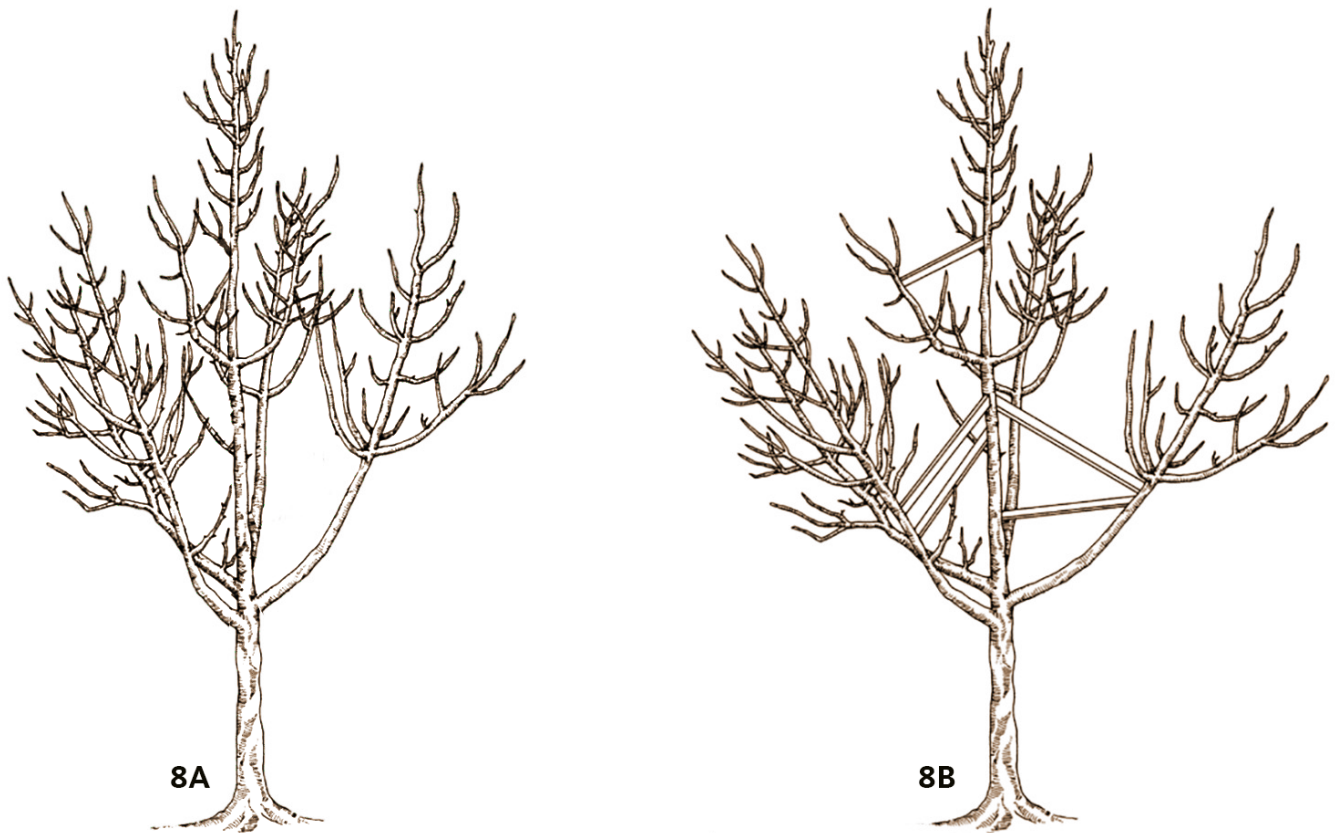


Figure 8. While the tree is young, spread branches that make narrow angles with the main trunk (8B, right). If these limbs are allowed to grow to a productive age without being spread, they usually break away from the trunk, often splitting the entire tree.

Credit: © Oregon State University

Modified central-leader training

A modified central-leader training system follows the same steps described for central-leader training (Figure 6). The central leader causes the lateral branches' angles off the trunk to be wider, which increases the crotch strength and helps induce early fruit production. Once you've chosen and established the main scaffold branches (Figure 1), the central leader is no longer necessary. You can remove the central leader in the third or fourth year of growth. Now, you'll be training the tree to a multiple-leader system.

Espalier training

Espalier training develops trees in two dimensions only, on a free-standing trellis or on a trellis mounted against a wall. In a home garden, you might use it to save space and enhance the aesthetic appeal of your fruit trees. It also creates a tree form that is easier to pick, prune and spray thoroughly for pests. In cooler climates with abundant spring rains, like Western Oregon, a wall espalier may be employed to grow some fruits, such as peach and nectarine cultivars, that might otherwise suffer from disease issues as free-standing trees.

You can grow dwarf apple trees on a post and wire trellis in a hedgerow. Posts may extend from 6 to 10 feet above the ground. Treated posts are best, but sound, untreated 4 x 4 cedar posts may work well. Anchor the end posts against another post driven several feet into undisturbed soil at an opposing angle.

Use galvanized wire, 12-gauge or heavier. The lowest wire should be about 4 feet above the ground, with higher wires at 2-foot intervals. Tie the main trunk to these wires, using a loop big enough to allow the trunk to grow without being girdled. If you attach the trunk to the trellis wire with $\frac{5}{8}$ -inch box staples, it will graft to the wire and not girdle.

If you use individual posts at each tree, make sure they extend at least 6 feet above the ground, and drive or sink them at least 2 feet into the ground. Wooden tree stakes should be 2 inches or more in diameter.

When training the tree, select buds to form the branches at the proper height and cut off the tree just above them. As the shoots from the buds grow — and before they've produced enough wood to become stiff — fasten them to training wires or sticks with masking tape or other suitable material (Figure 9).

Palmette is a specific pattern of espalier training. Develop the lowest branches first, angling them at about 30 degrees at the start. Widen this to 45–50 degrees when they're as long as you want them (Figure 10).

Head the central leader just above where you want branches, and develop one or two higher pairs of branches, keeping them shorter and slightly more spreading than the lower pair. It's best to have at least 18 inches vertically between branches.

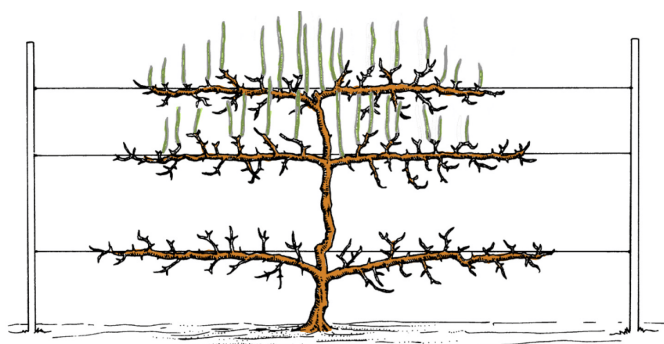


Figure 9. Espalier training

Credit: Page Biersdorff, © Oregon State University

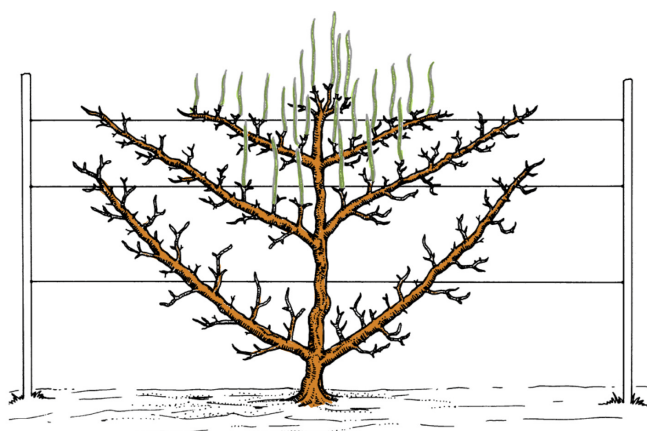


Figure 10. Palmette training is a form of espalier with angled branches.

Credit: Page Biersdorff, © Oregon State University

Fruiting habits

Figure 12 shows the difference in fruiting habit between peach and apple. Peaches bloom only on 1-year-old wood; apples usually bloom on spurs or shoots from 2-year-old wood. Figure 13 shows fruit spurs on a mature apple, which bear the fruit crop. Cherries, plums, pears and apples all produce their fruit on spurs.

Spurs require good light exposure in order to develop and be fruitful. Thinning cuts that open up the interior of the tree to light penetration help to keep fruitful spurs throughout the tree canopy.



Figure 12. One-year-old wood is the wood that grew during the previous summer: peach (left), apple (right).

Credit: © Oregon State University

Pruning tools

Long-handled pruning shears (Figure 14, top and center) are the most useful tool for almost all pruning jobs.

Hand shears (Figure 14, left) are useful for training young trees and for cutting smaller-diameter shoots.

If you need to make large cuts, use a pruning saw (Figure 14, bottom right).

If you must use a ladder, use only a sturdy stepladder. Set it firmly on the ground to prevent accidents. In most cases, it is possible to maintain even mature fruit trees with a short, three-step ladder.



Figure 13. The fruit spurs on a pear tree bear the fruit crop.

Credit: Neil Bell, © Oregon State University



Figure 14. Long-handled pruning shears, top, can be used for most jobs. Hand shears are good for small-diameter shoots. Use a pruning saw if you need to make large cuts.

Credit: Neil Bell, © Oregon State University

Applying the basics

Fruit trees

Apple (*Malus domestica*)

FULLY DWARF TREES

You must support fully dwarf trees, or they'll bend to the ground under the weight of their fruit. You can use individual stakes with each tree or build a trellis support system (see "Espalier training").

Training fully dwarf apple trees to a central leader supported with a post or trellis (Figure 6) can produce highly productive 6- to 10-foot trees. This system helps avoid bush-like trees only 4 or 5 feet tall that are bent down with the weight of their fruit.

In the spring following planting, when shoots are 3–4 inches long, select the uppermost vigorous shoot and remove other shoots near it. Return several times in summer and remove or tie down any shoots that could compete with the lead shoot because of their upright aspect and vigor. Head back the lead shoot by removing the top third in the dormant season.

Keep three to five branches that are 18 to 30 inches above ground to form a basic set of permanent branches. If they're upright, tie or weigh them down to nearly horizontal. Position higher limbs to below horizontal to reduce their vigor relative to the permanent basic set.

SEMI-DWARF TREES

You can train a semi-dwarf tree to a central leader or develop it as a multiple-leader tree, depending on the tree's vigor. Central leader training is best for weak-growing varieties on poor soil. Train vigorous cultivars with multiple leaders (three or four lead branches) to reduce the height of the tree. When these leaders are 4–6 inches long, spread them apart using short wooden spacers with notches at each end, or spring-type clothespins placed in the crotches of the branches. On a windy site, support the tree with a sturdy stake for the first 10 years.

In the following years, spread or tie out the lead limbs to about 30 degrees from vertical. Weigh down the side limbs that arise from these, if necessary, or spread them to horizontal to stimulate early production. As the tree begins to bear fruit, limbs may require propping or tying to prevent breakage.

'Spur-type' trees

This type of apple tree forms many small spurs on young growth rather than the usual long shoots and leaf buds (Figure 15). This is how it got its name. Because these trees fruit at a young age and are smaller than standard strains of the same variety, they make ideal home orchard trees.

Spurs are stubby shoots that form along a branch that is 2 years old or older. Each spur bears a flower cluster. The leaves are close together, the tree branches are less frequent, and the tree grows slowly.

Spur-type trees are available on both vigorous and dwarfing rootstocks. If you grow them on vigorous rootstocks, they may not require artificial support until they are in production.

Because they branch sparsely, leave more branches in a spur type than in a tree of standard growth habit. To train them to a central leader, space the lower set of limbs several inches apart vertically on the leader and reduce their number to four or five (Figure 6).



Figure 15. Notice the many short spurs with blossom clusters on this central leader of a 2-year-old, spur-type Delicious apple strain. This tree needs extensive pruning to allow it to grow and ripen the remaining fruit.



Figure 16A. This old seedling-rooted apple tree is maintained at a height of about 12 feet by extending the branches horizontally, rather than vertically.

Credit: © Oregon State University

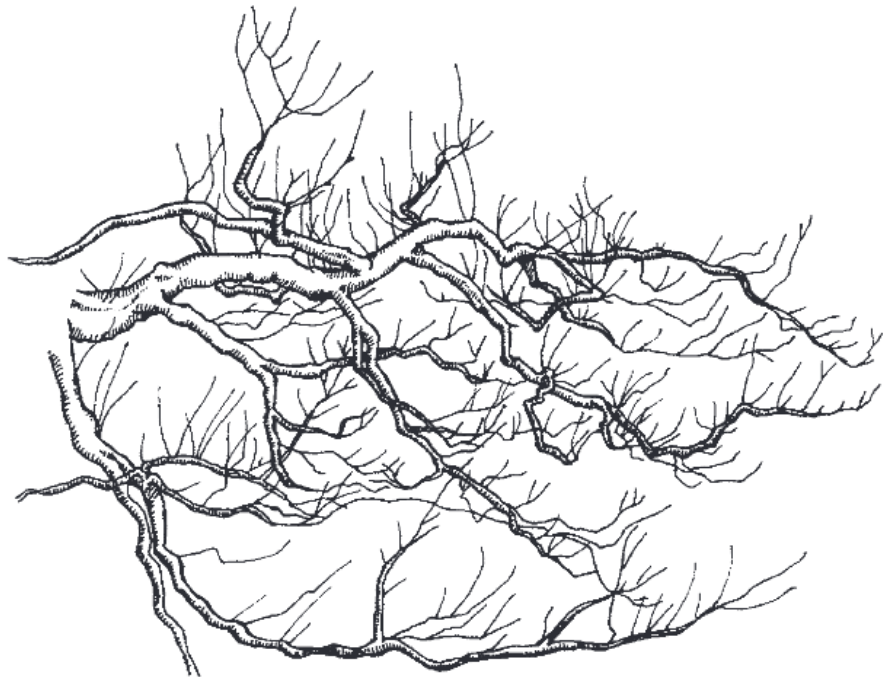


Figure 16B. This enlarged view shows how the slightly upward aspect of the entire main limb and the terminal part of the side limbs maintain a good balance between shoot growth and fruiting. Pruning consists of many small thinning cuts.

Credit: © Oregon State University

STANDARD TREES (FULL-SIZE TREES ON SEEDLING ROOTSTOCKS)

Fruit trees on seedling rootstocks are excessively vigorous, so they are not as suitable for home orchards as trees on growth-controlling rootstocks. However, you may move to a home where one of these old, mature trees is present and requires pruning to restore form and productivity. See the following section on “Pruning an old, neglected fruit tree” for guidance. If you choose to use a seedling rootstock, cut back the newly planted trees to 24–30 inches from the ground. Train them to the modified central-leader system.

It’s best to have only four main scaffold limbs, spaced equally around the trunk and vertically several inches apart. Develop the main scaffold limbs to just a few degrees above horizontal. Make sure that all secondary branches also have a gradual upward aspect (Figure 5).

The branches of a mature, nondwarf apple tree may spread over 40 feet in diameter and reach a height of 30 or 40 feet. Prune regularly and tie down upright limbs in the top to maintain a height of 12–15 feet (Figure 16A).

Prune to make the lowest limbs the most vigorous and productive in the tree (Figure 16B). Shorten, thin out and bend down the upper limbs to accomplish this. Remove **risers** (these grow straight up) and **hangers** (these grow straight down) from the permanent limbs to open a vertical space of about 3 feet between the lowest limbs and those above, so that light can penetrate.

Pear (*Pyrus communis*)

Initial research shows promise for growing pears on a trellis, but most commercial pears in the Pacific Northwest are grown with a central leader or modified central-leader training system. If you feel adventurous, you can try growing trellised pears. The following recommendations describe the standard way to train pear trees.

Head pear trees at about 24 inches at planting. If the top is branched, keep three or four branches as leaders. Select these leaders early in the first summer and spread them with spacers. Do little or no pruning except to head and spread the leaders annually until the tree starts to bear.

Don’t head side branches. Heading would maintain their upright position. Spread or weight all vigorous shoots except the lead shoots.

Open ladder bays between scaffold limbs of mature trees, and regularly reduce tree height to what you can reach from your ladder. Shorten or remove upper limbs so they don’t shade the lower limbs. Thin out the branches of mature trees and do the heaviest pruning in the top.

Remove long shoots in the center and top, but leave some short shoots and most spurs. Remove horizontal branches in the top of the canopy so they won’t produce vertical suckers.

Invigorate slow-growing spur systems by cutting them back to about half their length, or remove them and replace them with new shoots. On Anjou and Comice cultivars, cut back most of the spur systems and some shoots to increase fruit size.

Sweet cherry (*Prunus avium*)

At planting, head nursery trees at the height you desire for scaffold branches. Train sweet cherry trees to the open center system (Figure 5) with three to five scaffold branches. Young sweet cherry trees often grow vertical limbs 6–8 feet without branching. You must head them to induce lateral branch formation.

Prune in summer to reduce the regrowth of vigorous trees. If a young tree is growing rapidly, cut off a foot or more of new growth after about 3 feet of growth has been made in the summer. This will cause branching. You can hasten production by tying down or weighting limbs to horizontal.

To promote branching on trees that were not pruned in summer, head every shoot in winter to about 2 feet. After 5–6 years, stop heading and begin to thin out crowded branches.

Bacterial canker, (<https://pnwhandbooks.org/plantdisease/host-disease/cherry-prunus-spp-bacterial-canker>) a common disease of cherry trees, frequently causes gumming and dead areas or “cankers” on limbs. If it infects the crown or trunk, it can kill the tree. If a gummy, dead area encircles most of a limb, you must cut off the limb.

Bacterial infection can enter through pruning wounds. To avoid this, prune in August. You usually can avoid death from bacterial canker by budding or grafting a variety about a foot out on the rootstock limbs.

Mature trees require little pruning except as needed to reduce tree height.

Sour cherry (*Prunus cerasus*)

Sour cherry wood is quite brittle, so give special attention to developing wide-angled crotches in young trees. Either select wide-angled shoots to form limbs or spread shoots with spacers or weights to widen the angles. Three main scaffold limbs are enough for a sour cherry tree. The modified central-leader system helps form wide-angled scaffold limbs without having to spread them.

In the first and second summers, remove excess shoots so that all new growth is on the permanent scaffold limbs. In mature trees, only occasional thinning out of excess branches is needed to keep a good balance of light and fruitfulness throughout the tree.

Peach (*Prunus persica*)

Cut off peach trees about 12–20 inches above the ground at planting. Train trees to the open center or vase-type system (Figure 5). Develop no more than three or four main scaffold limbs. Select shoots that have the widest angles where they attach to the trunk and that are not all at the same height. Peach limbs with poor crotches split out more frequently than limbs of many other fruit trees.

Remove scaffold limbs that may compete with the three or four originally selected. Do this in the spring of the second year and again in the third year if necessary. Head the scaffold limbs in the first and second dormant seasons to cause branching until there are 6–8 secondary scaffold branches and 12–16 tertiary branches.

Peach trees bear flowers and fruit only on 1-year-old shoots (Figure 12). Every year, prune enough to stimulate new shoot growth for the following year’s crop. Peach trees branch readily, so they will have too many weak shoots unless you prune them properly. Thin out shoots, leaving those of moderate vigor. Remove all weak or very strong shoots.

Prune hardest in the top and near the ends of the major limbs. Cut top limbs back to side shoots to stiffen them and reduce tree height. Peach trees crop more consistently and have larger fruits if they’re pruned heavily. Commonly, up to 50% of the previous season’s growth is removed each year.

Peaches flower early in spring. In wet spring conditions, they are prone to disease problems like leaf curl. They are therefore good candidates for training as espalier on a protective wall, where foliage can remain drier and the added

heat assists with fruit ripening. Espaliering trees can likely expand the range of cultivars you can grow.

European plum and prune (*Prunus domestica*)

Asian plum (*Prunus salicina*)

Train prune and plum trees to the open center system (Figure 5) with three or four main scaffold limbs. Prune very lightly for the first five years. Head only the limbs that will be permanent scaffolds, remove scaffold limbs that may compete with the three or four originally selected, and do little else. Weighting or bending limbs stimulates early production.

In mature trees, thin out the top every few years and remove dead limbs as they appear. Flowers are borne in clusters on the 1-year-old and older growths. Most plums and prunes have ample bloom every year, so you only need to prune enough to control height and spread, keep the trees fairly vigorous and prevent limb breakage.

Asian cultivars (such as Shiro, Redheart and Burbank) are vigorous and have many long, thin shoots, so heading is far more important than it is in most European varieties. They may bear flowers along the length of the 1-year-old growth, and the crops they bear are typically heavy, to the point that limbs can break. Head back the long shoots to stiffen the remaining part. Thin individual branches within the canopy to avoid interior shading on these vigorous trees.

Apricot (*Prunus armeniaca*)

Apricot trees usually develop many branches in the nursery. Select some of them to be scaffold branches at planting time. Cut these branches back a few inches and remove other branches. One year after planting, cut back long shoots to induce branching. Train the tree as you would for peaches.

Pruning bearing apricot trees is mostly a process of thinning out excess wood and heading long shoots. Apricots will produce some fruit on 1-year-old shoots as well as on older wood. After a side shoot has produced for three or four years, remove it and let a new shoot grow in its place.

Even more so than peaches, attempting to grow apricots in cool, wet Western Oregon is probably best undertaken with an espalier on a protective wall. This protects them from spring frosts (apricots flower early) and rains as well as providing added heat for fruit ripening.

Fig (*Ficus carica*)

Figs are an unusual fruit crop in that they can produce two crops per year. Small fruits that form on the previous-season growth and overwinter can ripen in midsummer. Figs also bloom on current-season growth. In regions with warm summers, the fruit resulting from these flowers ripens in the fall. Some cultivars can ripen both crops in cool growing regions, but the midsummer crop is the most reliable. Fig trees can be grown in a multiple or single-trunk form. If you live in a region with severe freezing weather, consider growing the multiple trunk form so you can thin out trunks that suffer freeze damage. In other regions, a single-trunk form with three to five scaffold branches is suitable.

A mature fig tree can reach the size of a walnut tree. Be sure to prune the top for good light penetration into the canopy. Prune figs in early spring to remove any damaged or dead branches and shoots as well as reduce the tree height and thin the canopy to admit more light. For cultivars that produce only the overwintered summer crop, head back current-season shoots in early summer to several nodes to encourage production of overwintering fruit.

American persimmon (*Diospyros virginiana*)

Asian persimmon (*D. kaki*)

There are two species of persimmon trees, American and Asian. Both species produce fruit on the current-season shoots. The Asian persimmon tree is smaller when mature than the American and needs less maintenance pruning to contain its height. A multiple scaffold system with three to five main scaffold branches is suitable for persimmons. Because the fruit load can be quite heavy, ensure that crotch angles are wide by employing spacers or weights as scaffold branches grow. Remove any weak branches and twiggy growths that develop within the canopy to maintain good light penetration for fruit maturation.

Pruning an old, neglected fruit tree

A tree that hasn't been pruned for several years will have a dense thicket of upright shoots in the top and many weak, pendulant (downward-facing) spur systems farther down (Figure 17). It's best to prune the tree back into shape gradually over several years, rather than trying to do the whole job all at once.

After you identify the main scaffold branches, saw out any excess large branches. Cut ladder bays so you can place your ladder in the tree's center. Climb as high on your ladder in the tree's center as you intend to pick, and cut the main scaffold limbs down to the height that you can reach. As noted earlier, it is usually possible to maintain almost all mature fruit trees from no more than a three-step ladder. However, this may be more challenging on old cultivars that are not on dwarfing rootstock.

Remove limbs that overlap or hang down into other limbs. Thin out most of the upright shoots, leaving some of the smaller ones. Cut back weak, pendulant limbs. Gradually invigorate the spur systems by cutting some back and removing others. Keep the center of the tree fairly free of limbs so that light can penetrate.

Don't head shoots. Remove them entirely by thinning, or let them bear fruit and rely on the weight of the fruit to bring them down. Thin off shoots on the inside of upright branches so that fruit will pull them to the outside of the canopy.



Figure 17. In a poorly pruned tree, upper limbs shade out lower limbs, and a dense thicket of suckers appears in the top. Cut the drooping terminal portion to a more upright branch (arrows). Remove some of the suckers, cutting close to the limb; thin out side shoots on others so that they'll bend over with the weight of the fruit.

Credit: Page Biersdorff, © Oregon State University

Nut trees

Walnut (*Juglans regia*)

Cut off a newly planted walnut tree 4–5 feet above the ground. If you don't make this cut, the tree won't grow much for several seasons. The lowest limbs of a walnut tree have a habit of drooping, so they should originate fairly high on the trunk.

Select three to five main scaffold branches in the first and second growing seasons and remove excess branches at that time. Use a modified central-leader system to help form wide-angled scaffold limbs.

After the scaffold branches have developed, no further pruning is required. Pruning doesn't hurt walnut trees, but they're so large that it's difficult to prune the top (where pruning would do the most good). Pruning will invigorate most old, weak walnut trees.

Hazelnut (*Corylus avellana*)

In nature, hazelnuts grow as bushes, but you can force them to grow in a single trunk by annually removing the sprouts that grow at ground level. Train the tree with three or four scaffolds, similar to training peaches

To be most productive, a hazelnut tree should make 6–8 inches of new terminal shoot growth every year on shoots at shoulder height. Frequent pruning helps maintain this growth. Prune hazelnut trees like peaches, but less severely. Hazelnut wood is especially susceptible to wood-rotting fungi, so it's important to make cuts at the branch collar with limbs or trunk. Remove as much of the poorly growing, moss-covered wood as possible, but leave large scaffold branches on which to grow new fruiting wood. Trim out the center branches. Remove suckers that grow up through the canopy from lower limbs, unless you can use these suckers to fill an opening in the top of the tree. In general, thin the canopy so that sunlight penetrates to all parts of the tree.

Chestnut (*Castanea sativa*)

Pruning methods for walnuts also work for chestnut trees. Head a newly planted tree around 4 feet from the ground. Select three to five scaffold branches after the first season of growth. Use a modified central-leader system to help form wide-angled scaffold limbs. If scaffold branches have not produced lateral growth in the first three feet, then head the scaffold to stimulate lateral branching.

In mature trees, prune in the top to ensure good light penetration throughout the canopy. Fully mature chestnut trees grow to 40 feet tall.

Resources

[Fruit Tree Training and Pruning](https://youtu.be/nnMfVqCY6J4?si=-TmVRVWaRsa81_43) (https://youtu.be/nnMfVqCY6J4?si=-TmVRVWaRsa81_43) and [Pruning Fruit Trees](https://youtu.be/dfkn1fC0gbo?si=tSL8KFalHFy0XYv-), (<https://youtu.be/dfkn1fC0gbo?si=tSL8KFalHFy0XYv->) Clackamas County Master Gardener Association.

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