

A Basic Guide to Pruning Hazelnut Trees

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.
- **Crotch angle** - The angle formed between the trunk and a limb. The strongest crotch angle is 45-60 degrees.
- **Crown** - The part of the tree where the trunk meets the soil.
- **Heading (or head cut)** - A pruning cut that removes only part of a branch (Fig. 1).
- **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 limbs** - Large limbs that form a tree's framework.
- **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.
- **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 apical end or shoot tip.
- **Terminal bud** - The bud at the end of a shoot marking the end of current season's growth.
- **Thinning cut** - A pruning cut that removes an entire branch from its point of origin (Fig. 1).
- **Training** - Pruning in the early years after planting, to develop a structurally strong branch framework.
- **Vertical branch** - A branch that grows upright.
- **Water sprout** - A 1-year-old shoot that grows within the tree.



Figure 1. Thinning cut (left) vs heading cut (right). Thinning cuts help open up the tree to light penetration, which is important for nut development. Most cuts on mature trees should be thinning cuts. Heading cuts help induce new shoot formation below the cut.

Why train and prune hazelnut trees?

Training is a term applied to trees from planting up to 4-5 years of age, and is used to encourage a strong tree structure capable of supporting heavy crops, and withstanding ice and snow loads.

Pruning is used to manage tree growth beyond the establishment phase of a tree, and to invigorate older trees. In hazelnuts, it is also a means of removing diseased or dead wood to extend the life of an orchard.

Training

- Establishes structure, framework, years 1-5

Pruning

- Removes dead or diseased wood
- Increases light within the canopy which can increase the number of flower buds and nut set
- Used to manage growth and keep tree structure/framework balanced
- Reduces tendency to biennial bearing in some cultivars if done consistently
- Removes poorly placed limbs
- Re-invigorates growth
- Allows for better spray coverage
- To be most productive hazelnut trees should put on a minimum of 6-8 inches of new terminal shoot growth every year on shoots at shoulder height, and pruning helps maintain this growth

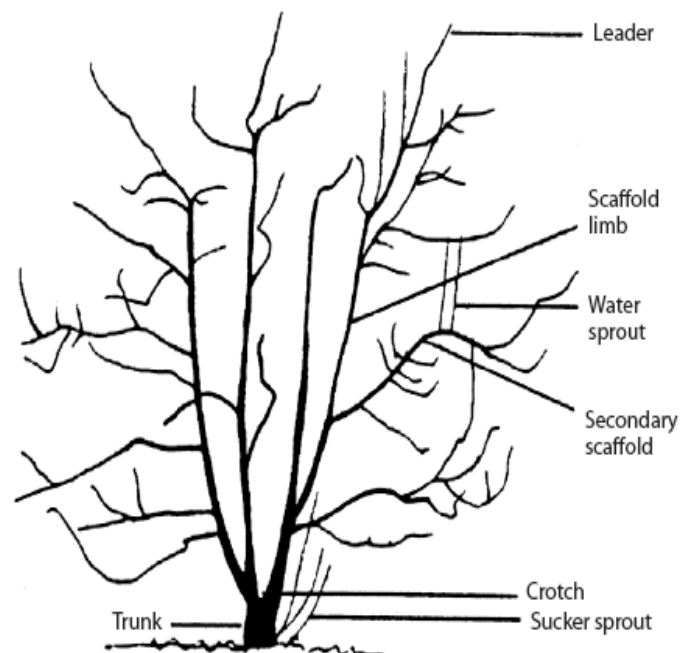


Figure 2. Common terms used in pruning and training trees.

General rules for pruning

Prune at planting with a heading cut.

Remove unwanted suckers annually when they're small and before they've hardened off.

Follow the pruning program consistently, as often as necessary so that training is performed early. Removing unwanted branches when they're small results in smaller wounds that heal over more quickly than larger wounds.

Prune young trees lightly.

Prune old trees more heavily, especially if they've shown little growth.

Don't try to overcome several years of neglect in one year. Don't remove more than 25-30% of the living canopy at any one time.

Hazelnuts can be pruned in the winter, spring, or summer. Pruning during the dormant season will generate the most vigorous growth the following spring. Spring or summer pruning generates much less return growth, and is useful in removing suckers and low hanging limbs.

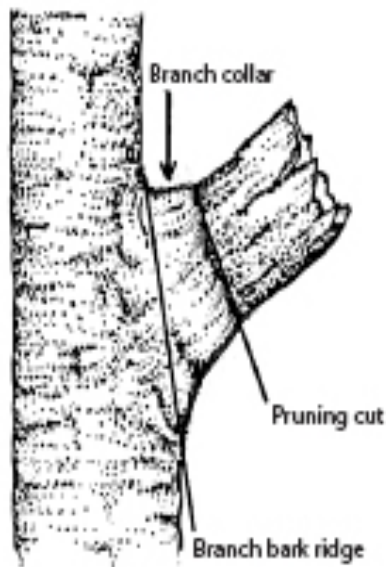
How to make the cut

Prune branches so that you don't leave stubs.

Do NOT use wound dressing/paint.

Since hazelnut wood is particularly susceptible to wood-rotting fungi, it's important to make thinning cuts at the branch collar where the branch attaches to a larger limb or the trunk.

Figure 3. The branch collar on trees contains specialized cells that help a tree seal off pruning wounds and reduce rot that damages the branch's heartwood. Since the branch collar is difficult to see on hazelnuts, make cuts as close to their point of origin without either leaving a stub or cutting flush to the limb or trunk from which it arises.



First year - Training

Top the trees with a heading cut 28-34 inches from the ground at planting time. Transplanting shrinks the root system, and topping helps reduce moisture demand.

Trees topped at planting generally attain a larger size more quickly.

Topping promotes the production of multiple leaders, which, when carefully selected during the summer of the first year, can become future scaffold branches.

During the first dormant season, select 3-5 major limbs to become the scaffold branches (Fig. 4A).

Second year – Training

During the second winter select 1 or 2 additional scaffold branches (Fig. 4B).

Choose limbs that are evenly spaced around the tree trunk in different directions and have some vertical space between them (preferably at least 6 inches, or 15.2 cm).

Remove all of the other limbs.

If the primary scaffolds have grown more than 2 feet in length and failed to send out lateral shoots, head them to stimulate lateral branches.

Years 3-5 - Training

By the third winter, scaffold selection should be complete and pruning can focus on terminal branches to reduce crowding (Fig. 4C).

If you have trees with an upright growth habit such as Jefferson, removal of one or two upright branches in the middle of the tree in the fourth or fifth year will open up the tree (Fig. 4D).

Continue to make adjustments as in the second year with heading back or removal of limbs growing too close to each other. There is a tendency to remove too much wood in the early years; take out only what is obviously crowding, rubbing, low hanging, and water sprouts.

Years 5-10 – Maintenance Pruning

During these middle years, pruning consists mostly of removing water sprouts, thinning cuts in the interior of the canopy and removal of low hanging limbs that interfere with spraying herbicides or machinery movement.

Renewal Pruning in Mature Trees

For production pruning, prune one-fifth of the orchard each year.

Although hazelnut yields may be reduced the first year after pruning, they will recover in subsequent years.

Start by removing diseased and dead wood.

Remove limbs that are crossing or too close together.

If you have trees with very dense canopies that have not been opened up, removal of 1-3 upright limbs in the center will allow more light into the tree.

Use thinning cuts to open up the canopy so that light penetrates all parts of the tree.

Trees with very open growth habit, such as Yamhill, will require less pruning and have naturally wide branch angles.

A good rule of thumb is to remove 25% (or less) of fruiting wood (wood with catkins).

While removing a portion of the small, weak shoots to prevent overcrowding is beneficial, retaining some of these helps prevent the formation of undesirable water sprouts.

Remove poorly growing, moss-covered wood, but leave large scaffold branches for growing new fruiting wood.

Trim out center branches, and shorten low laterals.

Remove suckers growing up through canopy in the spring before they harden.

Heading back trees into 3- and 4-year old wood is particularly helpful in stimulating new growth and can maintain production in old crowded trees (Fig. 4). These cuts should be made just above a lateral branch so that no dead stubs are left.

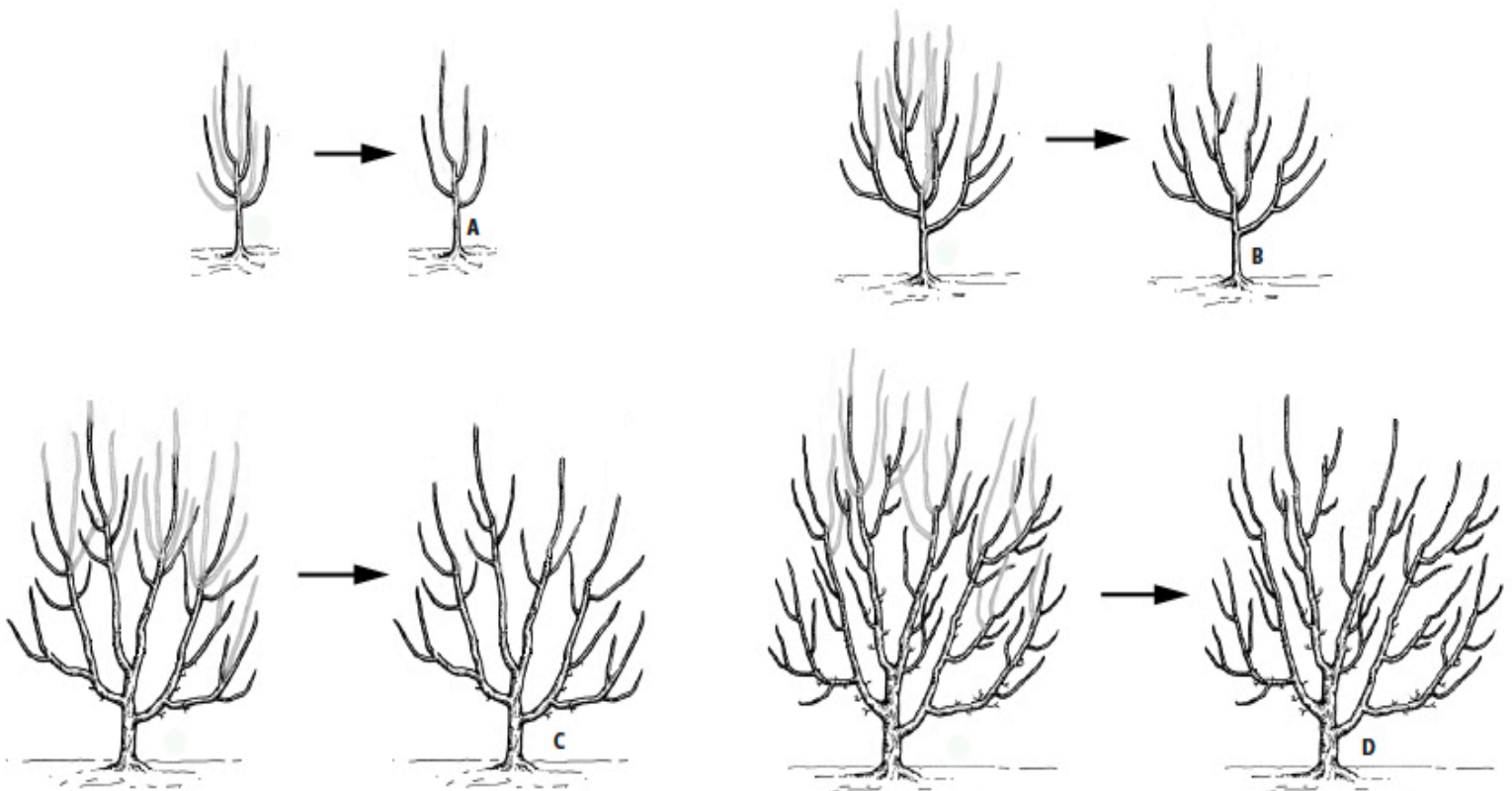


Figure 4. Four winters are required to train trees to an open center (gray indicates removed or headed shoots).