

Pruning Landscape Trees

WASHINGTON STATE UNIVERSITY EXTENSION



by Ray Maleike

Trees add beauty and value to your home's landscape. They modify your home's environment by providing shade and blocking the wind. Trees may help remove pollutants from the air. Correctly selected trees that are healthy and properly pruned dramatically increase property values. Trees enhance our quality of life.

Trees require maintenance, and pruning is one of the most important maintenance tasks. Pruning is the removal of plant parts to induce the plant to grow in a particular manner. Using correct pruning techniques can help maintain the health, vigor, and attractiveness of trees. Recent research has given new insight into the effects of pruning on trees and also has discredited some commonly accepted pruning practices. When work is done correctly, many plants need only an occasional light pruning rather than major annual pruning. Shaping the basic skeleton of a tree when you plant it may avoid drastic corrective pruning and other problems later.

Reasons for Tree Pruning

Size Control

Pruning can maintain or reduce the size of a tree, to keep it in balance with the rest of the landscape. Size control also can reduce shade, lessen the danger of a tree blowing over in a wind, avoid interference with utility wires, and simplify pest control. To reduce the amount of pruning needed, choose a plant species that at maturity will be the size and shape wanted. If a tree must be severely pruned every 5 to 7 years, it probably is too large for the given location. Choose a smaller species to plant there instead.

Health

Pruning may help prevent the spread of diseases, insects, and in some cases, rot of the main stem and branches. Correct pruning can increase light penetration and air circulation. Removing rubbing, interfering, or badly placed branches, and narrow "V" crotches can avoid serious future problems.

Safety

Removal of dead limbs and hazardous low limbs will increase the safety around a tree. You also may reduce wind resistance through correct pruning.

Training Young Plants

Main scaffold branches are easiest to train when the plant is young. It is better to shape the basic skeletal branches at this time using pruning shears than to attempt the same thing 10 years later using a chain saw. Initiate unusual tree forms, such as topiary, bonsai, or espalier, when plants are young. These pruning styles require much more maintenance than natural forms.

Improve Appearance

Pruning should shape the tree to accentuate, but not alter, its natural form.

Influence Flowering, Fruiting, or Vigor

Pruning can improve flower quality, which in turn improves fruit quality. You can change the balance between vegetation (leaves, shoots) and flowers (fruits) by pruning. Minimize alternate year flowering and cropping, and stimulate production of fewer but larger flowers or fruit by judicious pruning.

How Pruning Affects Plant Growth

Two basic types of pruning cuts are the heading cut and the thinning cut.

Heading Cut

This cut removes part of a 1-year branch back to a lateral bud (Figure 1), or removes part of an older branch without regard to the location of any branches or buds (Figure 2). On large branches, this type of pruning also is called stub cutting. The heading cut affects only the limb or trunk area where the cut is made.

A heading cut on a 1-year branch (Figures 1 and 3) forces growth of those buds close to the pruning cut. The bud closest to the top will determine the direction of new growth. Choosing to cut to a particular bud gives you some control of the direction of growth in young trees.

Do not head large branches or branches more than 1 year old (Figures 4 and 5). The results of heading cuts:

- New growth will be vigorous, upright, dense, soft, disease-prone, and generally a tangled mass close to the cut end of the branch.

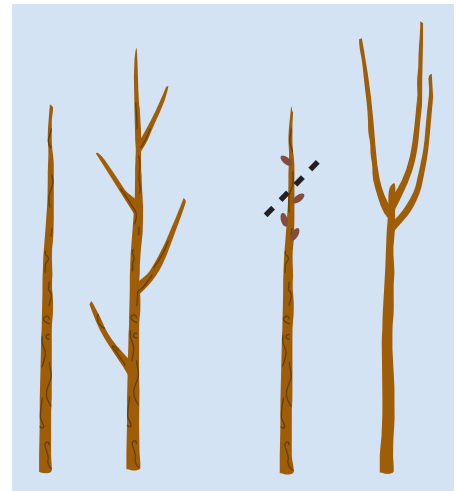


Figure 1. An unpruned 1-year stem usually develops a branching pattern with wide crotch angles dispersed along the stem (left). Heading a 1-year branch causes one to four buds to grow. These will be vigorous, upright, competing, and may be weakly attached (right). Codominant leaders may result.

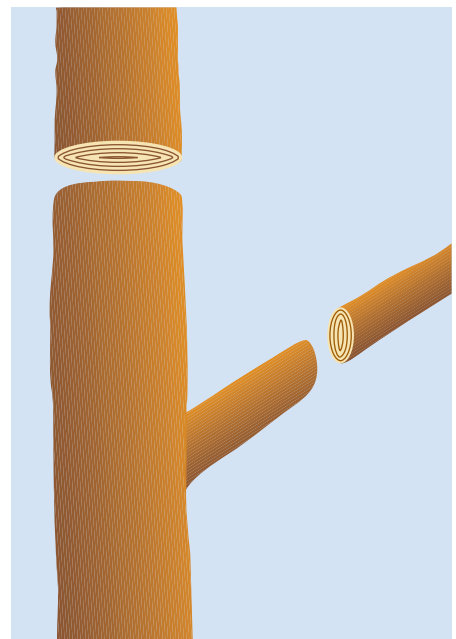


Figure 2. A heading cut, also called a stub cut, partially removes a branch or the main trunk. Subsequently, many vigorous, unsightly, weakly attached shoots emerge from below the cut. Growth is initiated only where the heading cut is made.

Figure 3. A heading cut made to an outside bud. The new branch will grow toward the outside of the tree.



- Newly emerging growth will be weakly attached and susceptible to limb breakage. The tree will be disfigured.
- Large areas of bare wood will be left exposed at the cuts, increasing the probability of disease entry or internal rot starting at the cut end of the branch. Rot can create an unsafe tree or eventually kill the plant.

Figure 4. This large heading cut has left exposed and dead branch wood. The interior portions of the stem and possibly the trunk will eventually rot because of this massive cut, creating a very hazardous tree.



Shearing (overall growth removal) is a series of heading cuts, typically done only on 1-year-old branches. This practice usually causes no long-term damage to the plant. However, most trees are not sheared.

Thinning Cut

A thinning cut removes a branch to its origin of growth or point of attachment. Pruning a branch back to another branch, a branch to the main trunk or the main

Figure 5. The heading or stub cuts of these large limbs have led to vigorous new growth. The tree also has been severely disfigured by this type of pruning. (Heart rot evident at arrow).



trunk back to a large branch are thinning cuts (Figures 6 and 7).

Thinning cuts:

- Direct growth to the remaining branches or trunks of the tree
- Retain natural form of tree and avoid vigorous sprouting at the site of the cut.
- Reduce rank, undesirable, vigorous (sucker) growth
- Allow more light to the center of the plant
- Decrease wind resistance
- Reduce potential disease problems
- May have a dwarfing effect on the tree.

Pruning Wounds and Wound Closure

Trees are unable to heal wounds the way animals do. Plants grow callus tissue in response to an injury. This tissue grows *over* the wounded area, but the damaged tissues are not repaired. Trees also chemically wall off the wounded tissue, in a process called compartmentalization.

Make pruning wounds as small as possible so the tree can close the wounds more quickly. The longer a wound remains open, the more chance it has to develop a problem such as internal decay.

How to Prune

To reduce the size of a 1-year-old branch, cut the branch back to a bud that points in the direction you want the new shoot to grow. Or, in the case of a central leader,

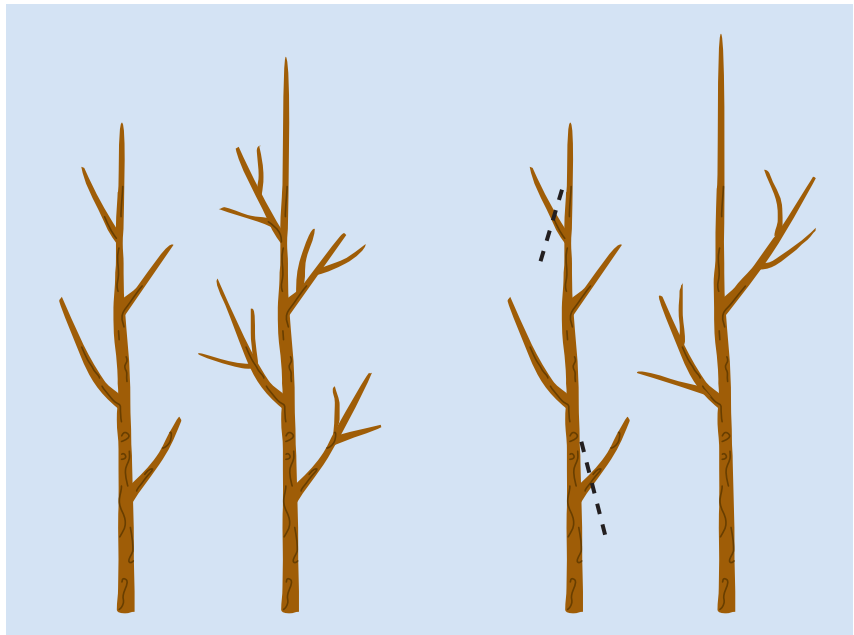


Figure 6. Typical branch development of an unpruned tree trunk and branches (left). A thinning cut eliminates the highest and lowest branches on the trunk and redistributes the growth to the remaining branches and main trunk (right).

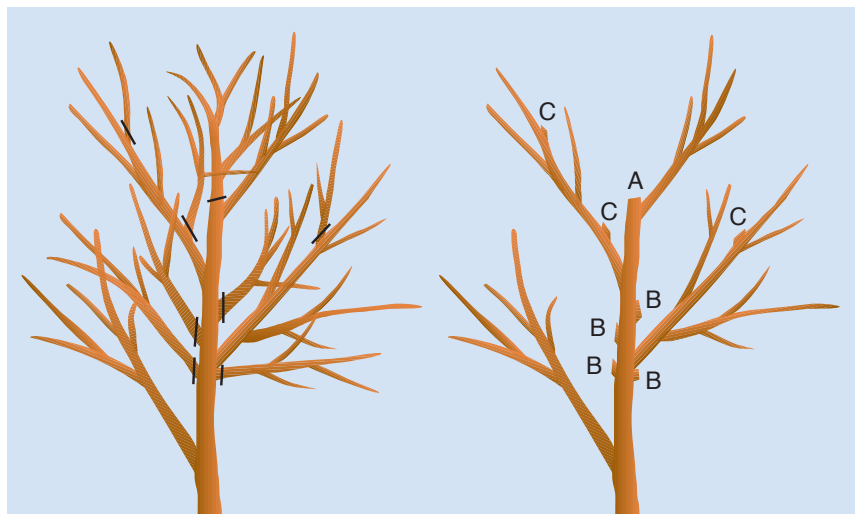


Figure 7. Thinning cuts remove branches to a point of origin, such as the removal of the main trunk to a branch large enough to assume apical (highest point) dominance (A), the removal of branches to the trunk (B), or the removal of branches to another branch (C). The basic shape of the tree remains the same after pruning.

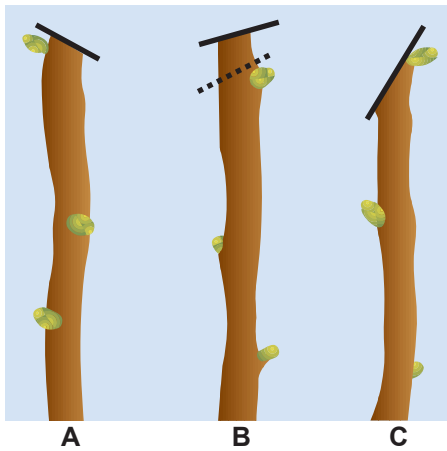


Figure 8. A correct heading cut (A) is made slightly above the bud, sloping down and away from it. The top bud grows either vertically or outward for a more horizontal branch. If the cut is too high (B) the branch may die back to the bud or further. The dotted line shows the correct cut. A heading cut made too close or at too steep an angle (C), may cause the top bud to dry out and die.



Figure 9. A tree branch with a branch bark ridge (arrow). The branch collar lies between the branch bark ridge and the red line. It usually appears as a swelling. The red line shows where to make a pruning cut to remove the branch.

where you want the first set of branches. Make the cut slightly above the shoot, sloping down away from the bud (Figure 8a). Make the cut too close to the bud, and it may dry out and die (Figure 8c). Leave too much branch above the bud, and the stub may die back and decay (Figure 8b).

It is important to make thinning cuts on larger branches correctly. Both the branch bark ridge and branch collar are thought to help the rapid closing and compartmentalization of pruning wounds. Make pruning cuts close to the outside of these areas (Figure 9). Use the three-cut system on large branches (Figure 11), so the bark of the pruned branch will not strip the bark down the trunk of the tree. Make the final cut outside the branch bark ridge and the branch collar.

Much of the pruning literature still recommends the traditional flush cut, making the cut as close to the trunk or branch as possible. Recent research has shown flush cuts may open large wounds, which may not close rapidly. Thus, flush cuts may be more susceptible to decay and may eventually cause the death of large sections of the trunk above and below the cut (Figure 10).

Wound dressings, tree paints, and other preparations used for years to seal and prevent decay are ineffective in preventing decay or hastening wound closure. If you feel it is absolutely necessary to use them, apply for cosmetic purposes only, using a very thin coat.

What to Prune

You may have three main goals when pruning a tree:

- to remove dead, diseased, or damaged wood,
- to eliminate rubbing, interfering or poorly placed branches, and
- to shape the tree.

Cut dead wood back to, but not into, live wood. You may prune out diseased wood to stop the spread of disease. Make a thinning cut well below the infected site into the healthy wood. Disinfect your pruning tools between each cut with 70% alcohol or rubbing alcohol; rinse and oil. Do not use chlorine bleaches that rust tools. Cut back damaged branches to another branch. This damage includes previous poor pruning cuts or stubs (Figure 12).

Eliminate rubbing, interfering, or poorly placed branches (Figure 13). Cut off branches that rub, will eventually rub, or that grow in the wrong direction.



Figure 10. Death of parts of the trunks on two trees due to flush cuts.

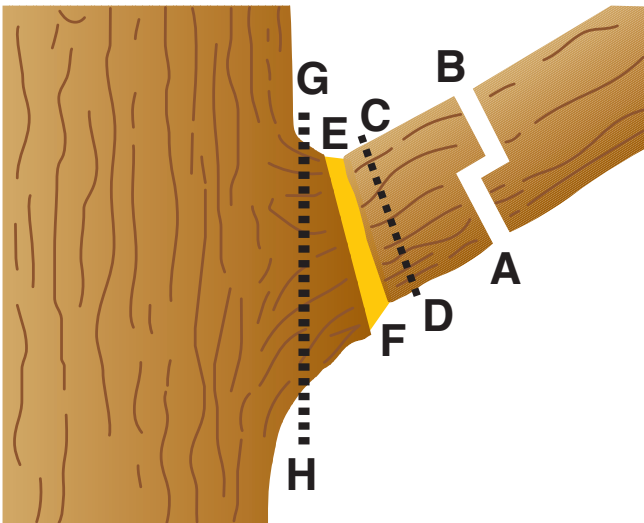


Figure 11. To avoid bark stripping when removing a large limb, make the first cut at A about 12 inches from the trunk. Make the second cut at B on the outside of A. Make the final cut outside the branch collar (E-F). A cut at C-D would leave too much of a stub, which might rot, and a cut at G-H is a flush cut.



Figure 12. Stubs left by previous pruning. Remaining stubs can allow internal rot. Cut the stubs back to, but not into, live tissue.



Figure 13. Examples of rubbing, interfering and poorly placed branches that should be removed.

Narrow “V” crotches (bark inclusions) occur when a layer of bark is squeezed between two branches growing very close together (Figures 14 and 15). Cut off one of these branches. Bark inclusions may cause one of the limbs to split in strong winds or under a heavy snow or ice load.

You may have very large, codominant leaders braced and cabled. Allow only a competent, certified arborist to undertake such a project.



Figure 14. Two branches (codominant leaders) with a layer of bark squeezed between them. This is called a bark inclusion and causes a very weak crotch. Remove one of the branches.

Prune the plant to the shape desired

Prune to accentuate the tree’s normal shape. When planting young trees, do not prune one-fourth to one-third of the top as is sometimes recommended. Severe pruning at the time of planting may reduce shoot and root growth the following year. When planting a tree, prune out the dead, diseased, and damaged branches, cut the rubbing, interfering, and poorly placed branches, then prune the plant to the shape desired. Select the main scaffold branches as early as possible.

Water sprouts or suckers sometimes emerge when a tree has been severely pruned. These almost always grow from a stub cut. Species such as crabapples, hawthorns, and flowering plums produce many of these vigorous shoots—always poorly placed and interfering. Prune them when young or physically rub them off when they are quite small (right after the shoots emerge).

Tree Topping

Tree topping removes a major portion of a tree's top by cutting large branches back to stubs. Topping is a poor practice and is not recommended. Topping a tree may reduce property value, shorten the life span of the tree, and make the tree a safety hazard. Large stubs produced by topping:

- May not callus over, open to internal wood rot (Figure 4)
- May die back because of sun scald
- Produce rank growth more susceptible to ice, snow, and storm damage
- Produce lush growth that depletes root food reserves, weakens roots, and increases pathological problems
- Disfigure the tree and make it unattractive (Figure 16).

If a tree is much too high or large, or requires severe size reduction each year, replace it with a species that is smaller at maturity. **Topping a large tree is not the answer.**

Most bad pruning jobs on trees and subsequent rot problems are due to overuse of heading (stub) cuts on large limbs.

The only good way to reduce the size of a tree is to make thinning cuts, also called "drop crotching." To do this, select and cut higher branches back to a large lateral branch at least one-third the size of the main trunk or the limb to be removed (Figures 7 and 17). This reduces plant height, retains the natural shape of the tree, and allows the wounds to grow over.

When to Prune

Trees may be pruned any time of the year, but pruning at different seasons will cause different plant responses. Late winter and early spring after a general warming trend are good times to prune because callus tissue then forms rapidly. These are the periods of fastest redevelopment and readjustment to pruned limbs. Also, disease and insect activity is usually minimal. Prune trees that "bleed" from wounds (sap flow), such as birches, walnuts, and some maples, in late summer or early fall. Bleeding is normally not harmful to the plant.

Removing large quantities of foliage after (not during) a flush of growth, usually in late spring or early summer, tends to retard or dwarf a tree. If dwarfing is desired, this is a good time to prune. If you want more rapid development, pruning prior to leaf emergence in the spring is better.



Figure 15. Advanced stage of a bark inclusion between codominant leaders. Notice the split developing. One or both of these trunks may split and fall during high winds or under ice and snow load.



Figure 16. Stub cut trees are not only unsightly and disfigured, they probably will start to rot, become unsafe, and can die from this type of pruning.

Pruning in late summer or early fall can cause vigorous regrowth, which in some species may not harden off by winter. During this period, more disease pressure exists, and wounds close more slowly.

Pruning during cold periods in winter in colder regions, such as east of the Cascades, may cause some dieback around the cut.

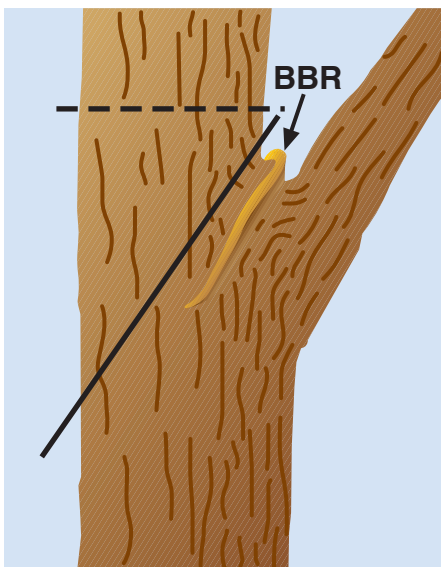


Figure 17. Drop crotching is a method of reducing the size of trees without making the potentially fatal stub cut. Make the initial cut on the dotted line and the second cut (solid line) outside the branch bark ridge (BBR).

Pruning Checklist

1. Determine why you want to prune the tree.
2. Most pruning cuts should be thinning cuts (cutting a branch back to the point of origin). Make heading cuts only on small branches just above a bud.
3. Make all cuts outside the branch collar.
4. Select branches to remove for the following reasons in this order:
 - Dead, diseased, or damaged (include stubs from previous poor pruning jobs)
 - Rubbing, interfering, poorly placed branches and narrow “V” crotches (codominant leaders)
 - Shaping the tree to the desired form
5. Select the main scaffold branches when the plant is young. This will avoid many problems later.
6. Do not use heading (stub) cuts on limbs more than 2 years old.



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