

# Pruning

Pruning is the most common tree maintenance procedure. Pruning of young trees is fundamental in the development of proper structure and form. If pruned properly, following the appropriate measure, the trees will require little corrective pruning as they mature. Pruning should be done with an understanding of how the tree will respond to each cut. If pruned improperly the damage can effect the tree for the rest of its life, or even shorten its life.

## Before you start pruning:

### Thing to consider:

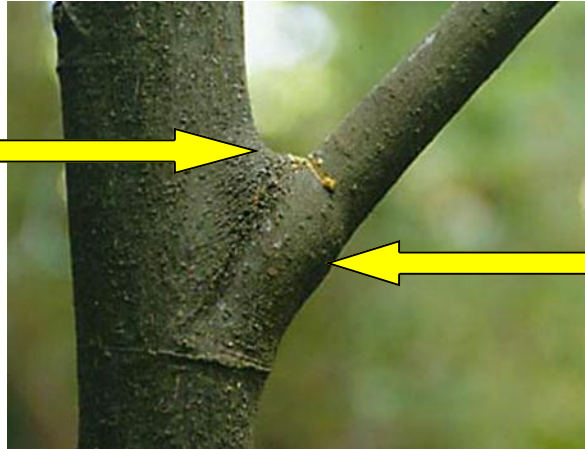
- Each cut has the potential to change the growth of the tree. Always have a purpose in mind before making a cut.
- Proper technique is essential. Poor pruning can cause damage that lasts for the life of the tree. Learn where and how to make the cuts before picking up the pruning shears.
- Trees do not heal the way people do. When a tree is wounded, it must grow over and compartmentalize the wound. As a result, the wound is contained within the tree forever.
- Small cuts do less damage to the tree than large cuts. For that reason, proper pruning (training) of young trees is critical. Waiting to prune a tree until it is mature can create the need for large cuts that the tree cannot easily close.

## The correct cut:

Proper pruning requires proper placement of cuts. Making the cut in the correct location is critical to a trees response, both in growth and healing the wound that is created.

## What To Look For:

1. Look for the branch bark ridge.



2. Determine the location of the branch collar. Look for a slightly swollen area at the base of the branch

3. Make the pruning cut just outside of the collar as indicated by the red line.



The branch collar is created by new wood being created by the parent stem over lapping new wood be created by the branch. This creates a strong point of attachment between the two. This also is an area which has specialized abilities for proper wound closure. Making the improper cut, limiting the trees ability to close its wounds opens it to a greater possibility of decay and disease.

## Improper Cuts:

Flush Cut



This type of cut removes the branch collar and the specialized area that stimulates proper wound closure. This wound will remain open, decay will become prevalent and bugs and disease have a direct route into the tree.

Stub Cut

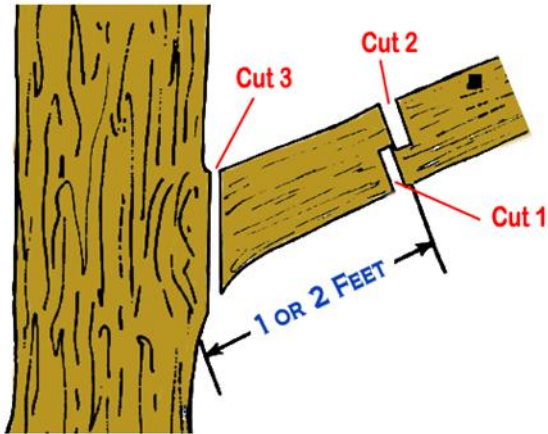


This type of cut creates a barrier to the growth that would close the wound, as the branch part that remains begins to die off it becomes a vector for decay, bugs and disease

## Cutting Large, Heavy Branches:

When cutting large branches, such as when you are using a hand or chainsaw, it is important to reduce the weight of the branch before making the final cut just outside of the branch collar. If this step is not followed the weight of the branch may cause it to separate from the parent stem before the cut is completed. This will leave a torn and ragged wound in which the branch collar has been damaged once again limiting the tree's ability for proper wound closure. The method is called the Three Cut Pruning Method.

## Three Cut Pruning Method



1. Under Cut: On big limbs the first cut should be on the underside of the branch 1 to 2 feet away from the parent stem
2. Top Cut: This is along the top of the branch a bit further out the limb from the undercut. This allows the branch to fall smoothly to the ground. If using a chainsaw it should be directly above.
3. Stub Removal: Now that the chances of damage are reduced make the final cut in front of the branch collar.

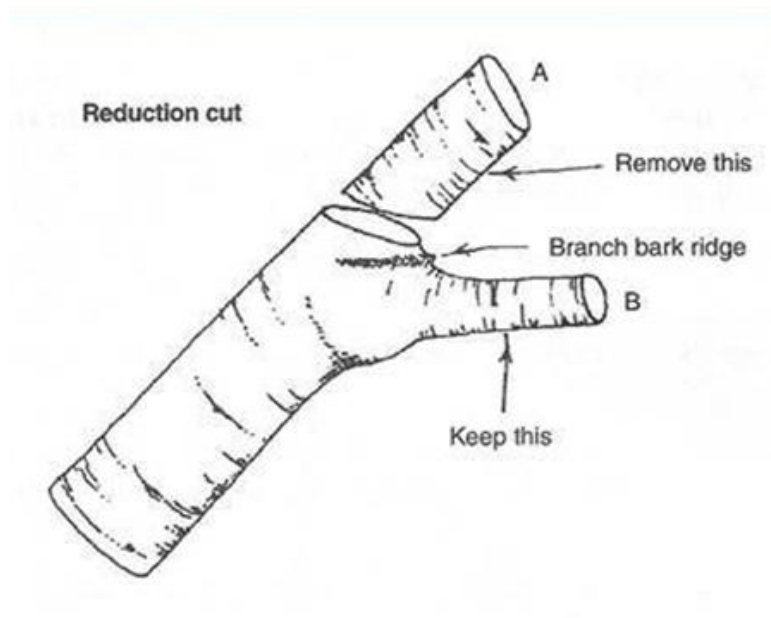
Do not remove a branch that is more than a quarter the size of the parent stem. Small wounds heal much faster than large ones. Determine the best cut to limit the size of the wound being created. If a branch needs to be removed but it is large make it a multiple year process by 'reducing' it, limiting its growth until the parent stem becomes large enough to handle the wound properly.

## Shortening or Reducing Branches:

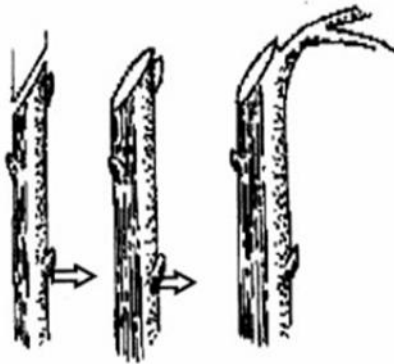
When a branch is to be shortened, make the cut at a lateral branch or if very small at a bud. Cuts made between buds or lateral branches, called intermodal cuts, can lead to stem decay, sprout production, and misdirected growth.



When making a reducing cut, make the cut back to a branch that is at least one third the size of the part of the branch being removed.



When performing this type of cut think about how a branch grows. Find a lateral branch that is healthy, has numerous buds, is growing in the appropriate direction, and that is structurally sound.



When cutting back to a bud, cut at about a 45 degree angle, and do not cut so close to the bud that when the branch heals over it cause the bud to dry and fall off.

# Pruning Tools

When pruning trees, it is important to have the right tool for the job. For small trees, most of the cuts can be made with hand pruning shears (secateurs). The scissor-type, or bypass blade hand pruners, are preferred over the anvil type. They make cleaner, more accurate cuts. Cuts larger than one-half inch in diameter should be made with lopping shears or a pruning saw.



Bypass pruning shears



**Never** use hedge shears to prune a tree. Whatever tool you use, make sure it is kept clean and sharp.

## Pruning Techniques

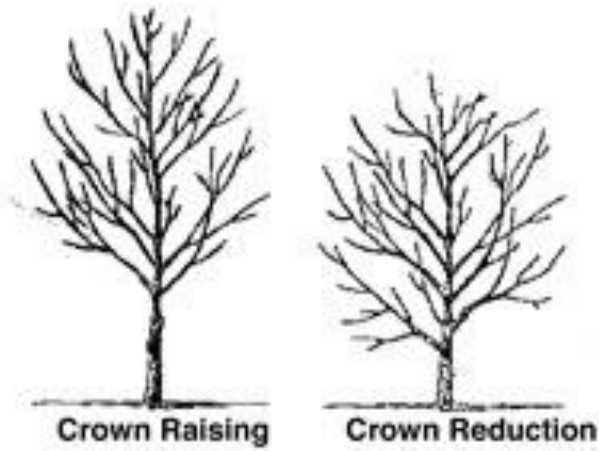
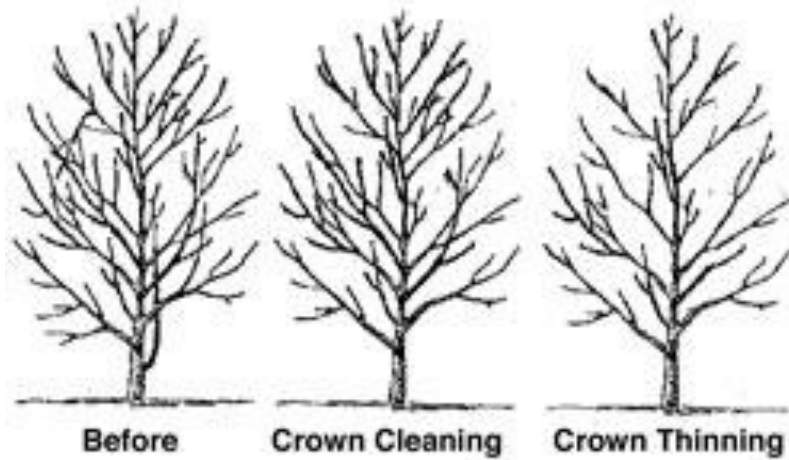
There are specific reasons for pruning that need to be considered. For young trees pruning is primarily completed to develop good structure. In mature trees pruning may be necessary to maintain a healthy, safe and attractive condition. The different techniques for mature trees include:

**Cleaning** is the removal of dead, dying, diseased, crowded, weakly attached, and low-vigor branches from the crown of a tree.

**Thinning** is the selective removal of branches to increase light penetration and air movement through the crown. Thinning opens the foliage of a tree, reduces weight on heavy limbs, and helps retain the tree's natural shape.

**Raising** removes the lower branches from a tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas.

**Reduction** reduces the size of a tree, often for clearance for utility lines. Reducing the height or spread of a tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least one-third the diameter of the cut stem). Compared to topping, reduction helps maintain the form and structural integrity of the tree.



## Structural Pruning of Young Trees:

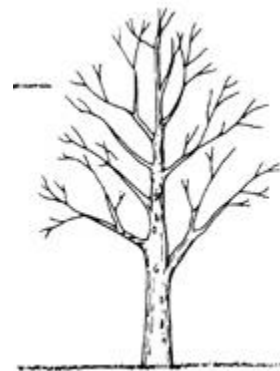
### Understanding Scaffold Branches

Good branch structure should be established while a tree is young. Scaffold branches are what create the framework of the mature tree. The goals of structural pruning is to establish a strong trunk, with sturdy well spaced branches. Knowing the growth habit of the tree will help in making good pruning decisions. Good techniques remove structurally weak branches but continue to maintain the trees natural form.



Before

**Select strong, permanent scaffold branches that are spaced 12 to 18 inches apart.**



After

## Trunk Development

For most young trees it is important to develop and maintain a single main stem, or leader, growing upward. Do not prune back the tip, nor should you allow secondary branches to grow above the leader. When a tree develops double leaders, known as co-dominant stems, it is best to remove one to maintain strength.



**When co-dominant stems develop, bark may become 'included' as the stems grow together. This creates a point of weakness. It is best to prune one of the stems while the tree is young.**

The lateral branches growing along the main leader contribute to the development of a sturdy well-tapered trunk. It is important to leave some of these lateral branches in place, even though they may be pruned out later. These branches, known as temporary branches, also help protect the trunk from sun and mechanical injury. Temporary branches should be kept short enough not to be an obstruction or compete with selected permanent branches.

## Permanent Branch Selection

Nursery trees often have low branches that may make the tree appear well-proportioned when young, however low branches are seldom appropriate for large-growing trees in an urban environment. How a young tree is trained depends on its primary function in the landscape. An example would be if planting a street tree it is suggested it be pruned to allow at least 16 feet of clearance for traffic. Most landscape trees require only about 8 feet of clearance to provide safety for those walking or working under it.

The spacing of branches, both vertically and radially, in the tree is very important. Branches selected as permanent scaffold branches must be well-spaced along the trunk.

A good rule of thumb for the vertical spacing of permanent branches is to maintain a distance equal to 3 percent of the tree's eventual height. Thus, a tree that will be 50 feet tall should have permanent scaffold branches spaced about 18 inches apart along the trunk. Avoid allowing two scaffold branches to arise one above the other on the same side of the tree. Maintain radial balance with branches growing outward in each direction.





Nice spacing

Branches should be well spaced, around the trunk as well as up and down. The tree on the left has been pruned appropriately.



Poor spacing

#### Rule of Thumb:

For vertical spacing of permanent branches maintain a distance equal to 3% of the trees eventual height.

Example: trees mature height = 50'

$$50' \times .03 = 1.5' \text{ then change to inches: } 1.5 \times 12 = 18 \text{ inches}$$

## How Much to Prune

The amount of live tissue that should be removed depends on the tree size, species, and age, as well as the pruning objectives. Younger trees tolerate the removal of a higher percentage of living tissue better than mature trees do. In general never remove more than 25% of the living materials within a growing season. An important principle to remember is that a tree can recover from several small pruning wounds faster than from one large wound.

A common mistake is to remove too much inner foliage and small branches. It is important to maintain an even distribution of foliage along large limbs and in the lower portion of the crown. Overthinning reduces the tree's sugar production capacity and can create tip-heavy limbs that are prone to failure.

#### Citations:

International Society of Arboriculture: [Pruning Mature Trees](#), [Pruning Young Trees](#), Updated September 2005