

TREE PRUNING & MAINTENANCE

ReGreenSpringfield



*The Springfield
Department of
Parks, Buildings
& Recreation
Management*



TREE PRUNING

Pruning can be detrimental or beneficial to trees. Removing too much live foliage can drastically reduce the photosynthetic capacity of the tree. This can limit the amount of food needed to maintain tree vigor and survivability. Trees in an urban situation can experience many stressors that inhibit vitality and it is important to limit these stressors as much as possible. Tree phenology and season should be considered before any pruning operation. Apple trees pruned at the wrong time of year can reduce flowers, which will reduce the crop size.

Beneficial pruning can reduce the number of dead or diseased branches, help with form and structure, increase airflow through the canopy that can help reduce disease, increase flowering, or allow for clearance such as near a sidewalk or road. It is important to define and adhere to clear objectives and goals before starting to prune a tree. Some considerations when starting a pruning project include:

- ◆ **Season & Tree Flowering Time**

In most cases it is never proper to prune in the spring for flowering trees. The preferred times are fall and winter. Not so with diseased, dead or dying branches which should be pruned regardless of season.
- ◆ **Type(s) of Pruning Treatments**

These can include thinning, cleaning, raising, structural, reduction, and restoration.
- ◆ **Size of Branches to be Removed**
- ◆ **Amount of Live Foliage to be Removed**

It is never a good idea to remove more than 25% of the live foliage at any one time. In some cases even less foliage should be removed. It is important to accurately estimate a tree's health before pruning is to be undertaken. Removing too much foliage can result in a mortality spiral that may be hard to effectively overcome.
- ◆ **Location of Hazards**

Never prune trees or branches within 10 feet of electrical lines. When pruning near roads be cognizant of traffic and pedestrians.
- ◆ **Height of Branches to be Pruned**

Never use a ladder to prune trees. If the offending branches are too high to reach with a pole pruner, hire a professional arborist. Never climb into a tree to prune unless you are properly trained to do so.

The preferred tools to use when pruning are bypass loppers, bypass hand pruners, hand saw, and a pole saw or pole pruner. Bypass tools have blades that cross each other. Anvil pruners are not recommended. Pruning saws have blades that cut in the pull stroke. All tools should be kept sharp and clean. When pruning diseased branches make sure to sterilize the tool before making another cut. This will help prevent the spread of disease.



Figure 14: Three types of pruning tools. (L to R) 1) Bypass Hand Pruners, 2) Hand Saw, 3) Pole Saw or Pruner.

- ◆ Proper Pruning cuts should be made as close as possible to the branch collar.
- ◆ Do not cut into the branch bark ridge or branch collar.
- ◆ Hold the branch with one hand to support the weight while cutting with the other hand.
- ◆ Make sure the branch you are cutting can be easily supported without excessive strain.
- ◆ Try to make the cut as smooth as possible.
- ◆ When pruning larger diameter branches use the Three Cut Method illustrated in Figure 12.

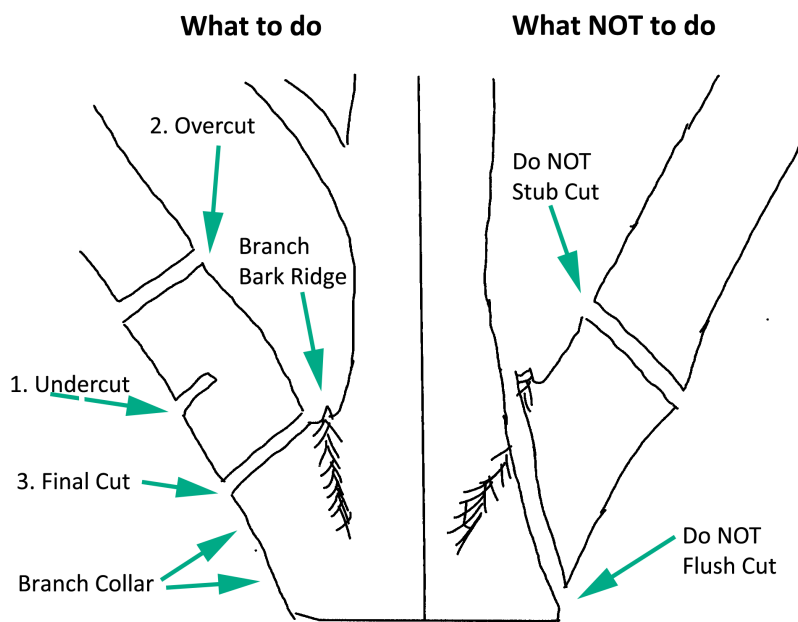


Figure 15: The proper way to cut a large diameter branch to prevent the bark from tearing down the side of the tree. 1) Start with an undercut partway through the bottom of the branch at a comfortable distance away from the branch collar. 2) Make an overcut no more than six inches away from the undercut in the opposite direction of the branch collar. 3) Make the final cut to remove the stub in front of the branch bark ridge and outside

the branch collar.

The purpose of pruning is to encourage the development of a strong, healthy tree. When starting a pruning project prune first for safety, next for health and finally for aesthetics. Avoid pruning trees when you might increase susceptibility to important pests. Educate yourself on the important aspects of each tree species you plan to prune. Do not prune species such as sugar maple (*Acer saccharum*) and paper birch (*Betula papyrifera*) in the spring as they will bleed heavily.

Pruning trees when they are young develops strong branch attachments and structure. Removing small branches is cheaper and easier than waiting until they get larger. Young tree pruning saves money and promotes a strong, safe tree.

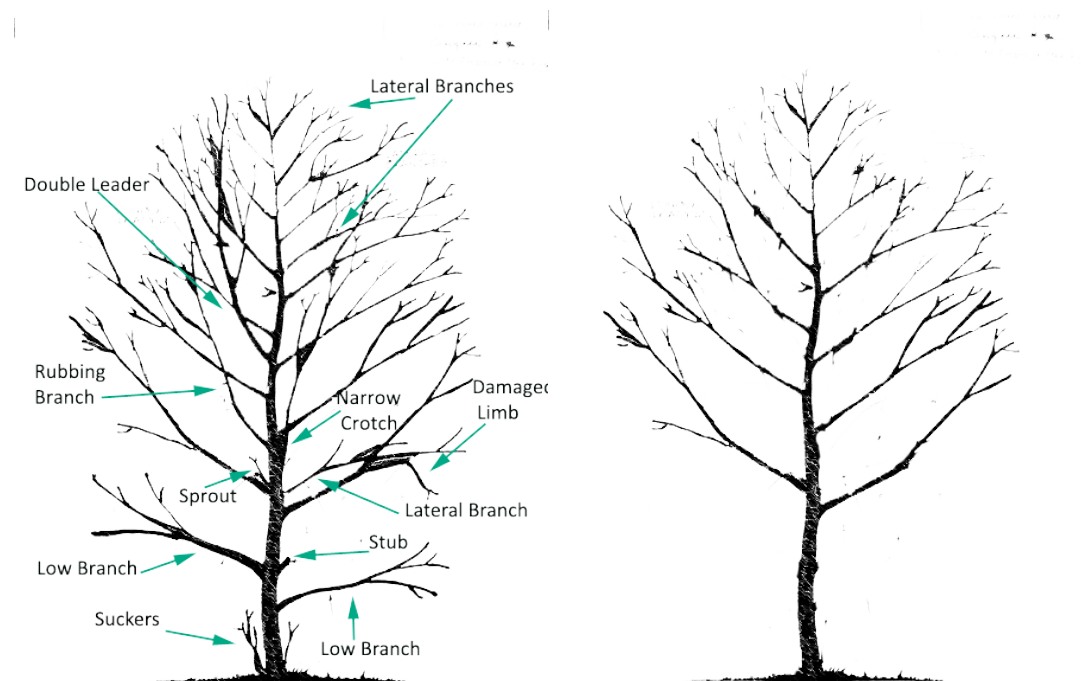


Figure 16: Pruning just a few key branches can make quite a difference in the appearance and structure of a young tree.

Limit pruning of newly planted trees to the removal of dead and broken branches or the correction of multiple leaders. Begin developmental pruning of deciduous trees 2-3 years after planting. Other key things to remember when pruning young trees are to:

- Know the general growth habit of a tree before beginning.
- Leave the temporary lower branches on the tree until they reach 1 inch in diameter to increase trunk growth and root development.

- Always leave 70 percent of the tree height with live branches (see Figure 1).
- Avoid removing lower branches too quickly, keeping lower branches longer allows for larger and stronger tree trunks (see Figure 2).
- Concentrate efforts on removing crossing, rubbing, broken, diseased and weak-angled branches in the upper portion of the tree.
- Eliminate double leaders and basal sprouts.
- Develop one main leader on shade tree species such as: oak, maple, ash, and linden.
- Concentrate efforts on removing rubbing and competing branches on species such as crabapple.
- Space permanent branches 15-35 inches apart.

Remember developmental pruning is an on-going process over the first 15-20 years of a tree's life.

TREE MAINTENANCE

Fertilization is not recommended for newly planted trees. In most cases trees come from the nursery with fertilizer already in their system. Nursery owners do this to maintain health and visual appeal while the plant waits to be sold. It is very easy to kill a tree with over fertilization. Do not attempt to fertilize any tree without investing due diligence into the finer points of tree biology and soil chemistry. A simple mistake can result in a very expensive lesson. There are also substantial environmental and health concerns associated with certain fertilizer.

Pruning is a very effective way of controlling plant growth and structure. If done early and consistently it can be very inexpensive. It is not until trees become very large and problems are not dealt with in a timely manner that remedies become more difficult to implement. The Japanese have transformed tree pruning and tree structure development into a fine art with bonsai. Education and practice are the only ways to effectively learn the art of tree pruning.

For the first two years after transplanting, a tree should be monitored daily for water. This can be as simple as taking a look as you pass by on your way out of the driveway. Looking for drooping leaves or leaf scorch will be the first signs of drought stress. It is helpful to establish a ritual of watering and adhere to it as much as possible. Sprinkler systems are not the preferred method of administering water but will work in a pinch. Soaker hoses are a much better alternative and can be set on a timer like an irrigation system. It is still important to monitor soaker hoses to ensure that they are functioning properly.

Three to five gallons of water per inch of trunk caliper should be administered at each watering. It is important to deliver the water slowly to avoid run-off and erosion.

Trees often do not display immediate responses to stresses because of their accumulated growth habit. However, with stresses come several changes within the tree depending on the damage caused by the stress. In some cases, the process of photosynthesis, which is the primary supply of carbohydrates for all tree functions, is reduced and the tree's stored food reserves are depleted. When root systems are damaged by construction damage, compaction, or poor drainage, they cannot supply adequate water and nutrients for the trees growth and survival. When this happens, often the tree is unable to produce sufficient carbohydrates and growth regulating chemicals. When trunks or stems are damaged, the carbohydrates movement to where it is needed for growth and function is stopped, and may result in death of roots or other growing points of the tree. The end result of these reduced processes is that the tree at best, operates at less than peak efficiency and in many cases it begins a downward spiral of all of its growth functions.

As stresses continue, the tree does eventually exhibit external symptoms. Annual incremental growth is reduced and becomes significantly less than normal. Leaves may be fewer in number and smaller in size. Sometimes, the tree produces excess fruit or seed as a survival mechanism. The tree may exhibit summer scorch symptoms because of insufficient water provided to the leaves during weather. With continued stresses, branches begin to die, and at the same

time the root system of the tree is reduced because the crown is producing inadequate food for good root expansion and growth. These processes continue into a downward spiral, usually resulting in the continued decline and eventual death of the tree over a period of 2-15 years. In most cases, once the tree has tipped the balance of not providing sufficient carbohydrates for continued growth of the tree, it cannot recover.

If the physical stresses do not kill the tree, it will often be exposed to more stresses through opportunistic diseases and insect attacks. These biotic attacks may speed up and/or complete the demise of the tree.

Much of the survival, growth and health of our woody vegetation in our landscapes is dependent on the homeowner/manager working to prevent stress and provide the optimal growing environment of the tree. This may begin with plant selection to ensure that the selected plant will perform well on the specific site and soil. Avoid injuries to trees and their expansive root systems during construction or when working around trees. Don't over fertilize trees; excessive leaf production often results in moisture stress during hot dry periods in Iowa. Avoid basal damage to tree trunks because this is the direct connect from the roots to the leaf tissue and area. Lawnmowers are still one of the major causes of damage to trees. Use proper pruning techniques, and avoid pruning during the spring period of leaf expansion. Use mulches to reduce temperature and moisture extremes. Use caution when using lawn irrigation systems; trees often suffer because of too frequent watering resulting in soils which are too wet for good root growth.

Newly planted trees generally take 3 years to put on substantial growth after planting, even in the most ideal growing conditions. The first year the tree "sleeps", then it "creeps", and then it "leaps". This refers to the rate of growth and is dependent on growing conditions and plant stress. It is important to consider this before replacing a tree.