

The Basics of Tree Pruning

By John Ball, Forest Health Specialist and Aaron Kiesz, Urban and Community Forestry Specialist

Until the end of the 19th century, trees were not a common sight in many parts of South Dakota. While scattered forests dotted the Black Hills and trees lined our rivers and streams, much of the state was prairie. Since that time new “forests” have sprung up around the state. Some surround farm fields and buildings to serve as shelterbelts. Others, ornamental and shade trees, grace our many communities. All these trees can provide a multitude of benefits from cooling us with shade to beautifying our homes.

Trees require proper pruning to properly fulfill these many useful functions. While forest trees may survive for centuries without any attention or pruning, the same may not be true for trees we plant around our homes, farms, and communities. Trees planted in these more exposed locations are subject to wind stress. Our ornamental trees have been developed with specific forms and, in some instances, flowering and fruiting characteristics. Pruning is often necessary to promote proper growth and form.

TRAINING YOUNG TREES



This is probably the most neglected area of tree care. Most people ignore the pruning needs of their young trees and wait until the tree is reaching maturity before beginning pruning. However, the ideal time to prune is during the first ten years after planting. This is the best time to establish the proper spacing and arrangement of the **scaffold limbs**. These are the lower permanent major branches that are directly attached to the trunk. Thinning out these branches while they are smaller diameter is much less harmful to the tree and will minimize the formation of decay.

The branches located along the lower five or six feet of a deciduous tree’s trunk are generally referred to as **temporary branches**. These branches are usually removed to provide clearance and improve visibility as the tree becomes taller. However, homeowners should consider the possibility of leaving these branches on the tree. Trees, such as lindens, develop a very pleasing egg-shaped form if allowed to retain their lower branches into maturity. Evergreen trees, spruces, firs and pines, also remain healthier and more attractive if these lower branches are retained. Leaving these lower branches also eliminates the need to mow close to the trunk of the tree.

If the homeowner does decide to remove these lower branches, these temporary branches should be retained until they reach a diameter of at least one-half inch. These lower branches contribute to lower trunk diameter growth. A large lower trunk increases tree stability and reduces the need for staking. The lower branches will also provide protection for the young bark against sunscald and splitting.



Most of the pruning required by young trees is referred to as **thinning**. Thinning is the selective removal of branches throughout the canopy to improve the structure of the tree. The first branches to evaluate for thinning are the **scaffold branches**, those branches five to ten feet from the ground that will become the lower permanent branches in the canopy. These branches must be properly selected to maintain a good form. One of the most persistent canopy problems is the development of two main leaders rather than a single leader. This problem is most common with green ash, but it will also occur with maples, lindens and a number of other species. These double leaders, also referred to as **codominant stems**, are weakly attached and are prone to splitting or breaking. Avoid the formation of codominant branches by eliminating one of the two upright stems. This should be done as soon as the formation is noticed. Removing a codominant leader once it reaches a diameter of 3 inches or more may result in decay entering the trunk.

Branches should be properly spaced along the trunk. As the tree matures and these branches increase in diameter, they can become too tightly spaced and begin to interfere with one another's development. Branches which are too close may also result in bark splits or cracking. The spacing for permanent branches for trees with a mature height of less than 30 feet is approximately 6 to 12 inches apart. Trees with an anticipated mature height greater than 30 feet should have a branch separation of approximately 12 to 18 inches.



In addition to properly spacing the scaffold branches, there are several other types of branches that should be watched carefully. Many young trees will have sprouts coming up around the base of the tree. These sprouts come from the roots or root flares. These are referred to as **suckers**. Many ornamental trees are cultivars placed upon a seedling-grown rootstock. Thus, the shoots that come from the roots do not have the same ornamental qualities as the cultivar. For example, a particular crabapple cultivar may have showy red flowers and small, hard yellow fruit

while the suckers from the roots may have small, white flowers and large, soft, red fruit. Some tree species produce suckers annually throughout their life so removing suckers becomes part of the regular maintenance.

The other branches to annually prune are **watersprouts**. These are rapidly growing upright shoots that form along the trunk or scaffold branches. The watersprouts are usually weakly attached and generally do not flower or fruit as profusely as the other branches. Watersprouts should not be confused with spurs. Spurs are slow-growing shoots that form along the trunk and scaffold branches. These can be distinguished from watersprouts by their numerous leaf scars that form on the short shoots. Spurs form the flowers and fruits for many of our ornamental trees.

PRUNING MATURE TREES



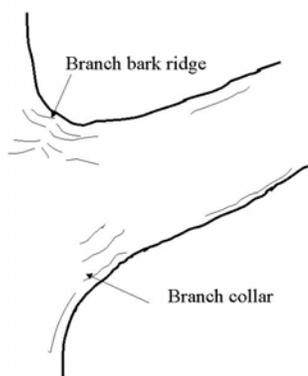
As a tree matures, the number of live branches removed should decrease. Mature trees have established a balance between their root system and the canopy. Drastically altering this balance by either removing roots or branches may stress the tree. If the tree has been properly trained during the first ten years there should be little need for additional pruning beyond the annual removal of suckers and watersprouts on certain trees. Mature tree pruning should concentrate on the removal of dead and dying branches. Often, homeowners unnecessarily thin out the canopies of mature trees in the belief that doing so will benefit the tree by permitting more sunlight to reach the interior leaves or to reduce the “sail effect” of the canopy. However, for most mature trees the interior leaves have adapted to the shaded environment and are often stressed by the sudden exposure to full sunlight. The canopies of mature trees have also developed so that the individual branches provide mutual protection for wind and ice loads.

Excessively thinning the canopies can leave the remaining branches more susceptible to breakage. Unless the branches are structurally unsound or additional clearance from buildings or other objects is needed, mature tree pruning should be limited to removing dead branches. The practice of removing the dead branches, along with dying or diseased ones, is called **cleaning**.

The pruning cuts employed for mature tree pruning should always be **thinning cuts**, removing a branch at its point of origin, rather than heading cuts. **Heading cuts** involve cutting to a stub, a practice that results in extensive decay in mature trees. Probably the most common form of heading practiced on mature trees is **topping**. This occurs when the entire top of the tree is pruned back to a specific height. Topping results in rapid formation of weakly attached branches, extensive branch decay and a decline in the root system. While trees rarely die immediately from this harsh treatment, it can result in decline and death over time. Topping is not an acceptable practice.



HOW TO REMOVE A BRANCH



Proper pruning will minimize the possibility of decay. Decay is most likely to occur if either a branch stub is left or a portion of the trunk is cut when the branch is being pruned. Proper pruning results in the entire branch being removed without violating the trunk. This is referred to as target pruning since the goal is to hit the target, removing the branch without injuring the trunk. This mimics the natural branch shedding process and allows the plant to retard decay. This is an internal as well as an external process. The internal chemical barriers are essential to the process but are often overlooked by the external process. The formation of callus around the pruning wound, while highly visible, is not the complete process.

The pruning cut should be made just outside of the branch collar. The collar is the slight swelling that appears at the junction of the trunk and the branch. This collar is an integral part of the trunk and should not be pruned off. The pruning cut should begin at the branch bark ridge and extend to the collar.



An excellent method of evaluating your pruning is to look at the formation of callus around the pruning wound about a year after pruning. If a branch has been properly pruned, the callus forms a ring completely around the wound so it almost appears as a “donut.” Improperly pruned branches, particularly those that cut into the trunk will form a crescent of callus instead of a ring.

Wound dressings or pruning paint are not necessary. While there are numerous products on the market, none have been shown to effectively slow or stop decay and several have been shown to increase the formation of decay. The best means of limiting decay in trees is to make the proper cut at the proper time of year. Pruning paints are not necessary, nor effective, in reducing decay.

There is a possibility of transmitting certain diseases, most notably fireblight, through pruning tools from infected trees to healthy trees. When removing branches infected with fireblight, be sure to dip the pruning tools in a solution of 1 part bleach to 10 parts water. This will kill the bacteria and prevent the spread of the infection. This same solution is very corrosive so the pruning tool must be rinsed after being dipped in the bleach solution.

WHEN TO PRUNE

Pruning dead and dying branches can be done at any time. However, the ideal time to prune live branches is March and early April. During the late dormant period there are a minimum of pests present and the pruning wounds quickly begin to close with the start of the growing season. However, light pruning, removal of less than 15 percent of the branches, particularly small diameter (less than 2-inches), can be performed at any time of



the year. Heavy pruning, removing more than 20 percent, should be avoided when the tree's leaves are first expanding in the spring and when the leaves are falling in autumn. These are times when the tree is expending much of its energy in starting or ending the growing season. At these times there may not be sufficient energy to resist decay. In addition, the removal of large branches, those more than 8-inches in diameter, should not be performed during autumn. Many of the decay fungi are releasing spores during this time period and there is a greater risk of increasing decay.



Pruning birch, maples and walnuts during the late dormant season will usually result in “bleeding”. This refers to the flow of sap from the pruning wounds during the warm spring days. While the sap flow may be unsightly and attract wasps and other insects, it is not harmful to the tree. If bleeding is to be avoided, however, the tree should be pruned in late summer, August, rather than during the dormant season.

Suckers and watersprouts should not be pruned during the dormant season. Removing them during this time usually results in excessive production the following spring. Instead, they should be removed in early summer, just after the tree has completed its spring growth. Pruning them at this time will limit new growth.