

## PRUNING SHADE TREES

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Pruning is as important in tree care as insect control and fertilizing. Pruning has been defined by Dr. L.H. Bailey, a former M.S.U. horticulturist, as, "The methodical removal of parts of a plant with the object to improve it in some respect for the purposes of cultivation." We will attempt to show the proper techniques of pruning and some of the more popular methods.

First of all let's consider why we should prune trees. There are three main reasons: health, safety, and appearance.

Pruning for health reasons includes: removing branches to allow more light to get to the center of the tree, removing dead, diseased, or broken branches to prevent insects and diseases from killing the tree, and removing branch stubs to promote healing and prevent decay.

Pruning for safety is primarily removing dead branches. We should do this before they break and fall where people may be walking or where children are playing.

Pruning for appearance may overlap with the other reasons just mentioned. It may involve removing broken or dead branches which are unsightly. However, most often we prune to maintain the natural form of the tree and to maintain vigorous growth. This type of pruning should begin when the tree is young to avoid making large cuts later. It is better to do a small amount of pruning each year than to do a large amount at one time when the tree is larger. Pruning for appearance may also include improving the grass growth.

Before we consider the proper techniques of pruning we should understand how tree wounds heal. The sap flows around the wound in an elliptical or football shaped course. Healing begins in a similar pattern, and eventually is completed when the wound is completely covered. Wounds are often shaped (traced) to take advantage of this in an attempt to promote speedy healing.

To get the desired healing pattern, all cuts should be made as close to the trunk or branch as possible. Rapid healing is necessary to prevent insect and disease damage, especially decay-causing fungi. Large cuts heal slowly making it more important to make the cuts flush and make the surfaces smooth.

A special cutting technique is necessary when pruning medium to large branches. It is best to remove them in a 3 step process. A preliminary undercut should be made about a foot out from the final cut. This cut should be as deep as possible without the saw binding. Then a second cut should be made an inch or two beyond the undercut, severing the branch. The remaining stub should be held or tied while the final cut is made so there will be no stripping of the bark below the cut.

An improper cut which leaves a long stub is unsightly and slows down healing. It also allows insects and disease to get started, resulting in more severe damage to the tree.

Another type of improper cut involves leaving an unnecessarily large wound. Secondly by not using an undercut, it is possible to strip the bark. This can result in a still larger wound and is very unsightly. This would also require a long time to heal and gives insects and diseases a good opportunity to begin destroying the tree.

Making the proper cuts is important to the health of the tree but removing the proper branches is important to the appearance. In this slide, we see a sketch of a typical tree. As we consider which branches to cut, we must understand which are the strongest and weakest points of the tree. The parts to look for and remove, are: dead or dying limbs, suckers at or near the base, water sprouts, branches growing toward the center, drooping branches, V-crotches, multiple leaders, and nuisance growth (growth that interferes with power wires, blocks views, etc.).

Removing V-crotches can present a difficult problem. Many times the real junction of the pair of branches is several inches (sometimes feet) from the apparent junction. The real junction is where the wood joins. The apparent junction is where the bark joins. The final cut must be made at the real junction to promote proper healing.

To promote proper healing the branch to be removed must be cut similar to the method of removing large branches. The first cut must be an undercut on the outside of the crotch. The second cut should be just above the first cut and completely sever the branch. The third cut should begin at a point 30° - 45° below the real junction sawing toward the real junction. This 30° - 45° angle allows the minimum of exposed wood surface and encourages the most rapid healing.

If the final cut is made at the apparent junction, the stub is slow to heal encouraging insect and disease damage.

Many times pruning is forced on us because of power lines. The presence of power lines doesn't mean we must have a misshapen tree. With a little planning we can have a very attractive tree. Some of the pruning methods we could use will now be discussed.

The first method is Topping. Topping is lowering the tree to avoid the interference. There are two (2) ways to top a tree - Drop-crotching or Heading.

Drop-crotching is cutting the main branch back to a sound lateral (side branch). Then the side branch is shortened accordingly to a sound lateral branch (not a twig). This procedure is followed until all branches have been shortened. In this way we maintain the natural form of the tree while lowering the entire crown. By properly using drop-crotching we avoid valley cuts which would give the tree an unnatural appearance. This method is also known as natural pruning.

Heading is a less desirable way of Topping because all branches are sheared to a uniform height. This results in an unnatural hedge-like appearance. Heading also results in great numbers of water sprouts. These sprouts grow rapidly but are weakly attached and rot easily.

Other methods of pruning for line clearance are Through-trimming, Side-Trimming, and Under-Trimming. Through-trimming allows the utility line to pass through the tree without interference. Side-trimming shortens the side branches that interfere. This method is commonly used but not always the most desirable. Under-trimming, also known as High Heading or Raising the Crown, is the best method although it isn't always practical. This method calls for the removal of all lower branches at the main trunk allowing the lines to pass under the crown. This also allows clearance for passing vehicles and better light penetration for surrounding plants, including grass.

A pruning method used primarily to reduce the overall size of mature trees and occasionally for line clearance is Pollarding. Although this method should be avoided if possible, it sometimes is the only alternative such as the removal of storm damaged limbs. Pollarding is the severe heading back of all major branches to a diameter of 6 inches or more and the removal of all secondary growth. This severe pruning results in vigorous growth which may be weak. As these sprouts fill out the head of the tree, it is difficult to maintain natural appearance. The species which respond to this pruning method are willows, soft maples, and poplars.

Thinning out is a pruning method used to remove dense growth and give more open space within the crown. Using the same principle as Drop-crotching (cutting back to a sound lateral branch), Thinning out encourages lateral growth which is stronger and slower growing than sprout growth.

In the case of flowering trees, do as little pruning as necessary since pruning usually induces vegetative rather than flowering growth.

Many times we prune trees for special effects. These methods give an unnatural shape but have artistic value.

Topiary pruning is a common method used on ornamental trees and shrubs. A variety of shapes can be produced such as cubes, balls within boxes, layered pyramids, and globes. It is possible to get unusual artistic shapes.

Espaliering is a method of pruning and training woody plants to grow against flat surfaces. This is done especially with ornamental fruit trees or dwarf fruit trees.

Pleaching is a pruning-training method to get woody plants to form arch-ways over alleys or sidewalks.

The time of pruning is extremely important. Some people advocate pruning "whenever the saw is sharp" (anytime). However, since healing occurs during the active growing season, most pruning should be done to take advantage of this growth. Late winter and early spring pruning will allow the wound to heal rapidly to prevent insect and disease damage. Tests show cuts made prior to May heal quickly while cuts made after July heal very slowly. Cuts made in the fall not only heal very slowly but have more dieback at the wound margin.

There may be several reasons for pruning at other times of the year. Winter is an excellent time to remove disease parts. The cold temperature aids the sanitation process by reducing the spread of disease causing organisms. However, extremely cold temperatures may damage the tissue around the wound,

thereby interfering with healing. This problem can be reduced by pruning in late winter or early spring before growth starts.

Summer pruning allows us to immediately see the effect on appearance of the tree. It is a good time to identify and remove weak and dying branches. Water sprouts should be removed during the summer because they are parasitic as well as unsightly. (They can be removed whenever they are found.)

Fall pruning should only be done in an emergency because of the ultimate slow healing. This slow healing could result in greater insect and disease damage and the unhealed wound is exposed to the danger of cold winter temperatures.

Certain species of trees should not be pruned in early spring because of the loss of sap. This sap loss or "bleeding" does not have a harmful effect but is unsightly. The trees known as "bleeders" are: maples, birches, and walnuts with ironwood and beech to a lesser extent.

The wounds created during pruning are often treated to prevent die-back and protect against insect and disease damage. Recent tests have shown that untreated wounds heal as fast as treated wounds, thus questioning the use of wound dressings. However, using wound dressings may be justified on the basis of the protective barrier formed to resist invasion by wood rotting fungi.

Wounds smaller than one inch seldom need treatment. Dressings used on larger wounds should (1) not damage living tissue (2) protect the wound from insects and diseases, (3) prevent the tissue from drying out, and (4) be durable enough so retreatment is not necessary. One of the better wound dressings consists of two separate materials - orange shellac, which is used to cover the cambium and bark, serves as a sterilizing agent and offers protection against drying out, and an asphalt base paint for durable protection. The asphalt paint, sold as tree wound dressing, is durable and may discourage insect and disease entry. Sprout-reducing additives are also incorporated in some commercial paints.

No discussion of pruning is complete without including equipment.

Pruning shears are especially suited for removing small branches and twigs. A pole pruner is a modification of pruning shears which are attached to the end of a pole. The cutting edge is activated by pulling an attached rope. This allows the operator to reach a greater distance. However, this may cause some incorrect cuts because of the difficulty of making clean cuts at a distance.

Lopping shears are similar to pruning shears but are of heavier construction and have longer handles for more leverage. They can be used for larger branches than the pruning shears. Hedge shears or pruners may be useful on occasion but are designed primarily to cut foliage, not branches.

Pruning saws are a basic tool for pruning. They make cleaner cuts than shears which aids the healing process. These saws may be straight or curved and have coarser teeth than carpenter saws. This reduces the problem of binding in green wood. The teeth are designed to cut on the pull stroke which is an advantage when working on ladders or from ropes. Like shears, saws may be attached to poles for pruning higher branches, but it is more difficult to get good clean cuts.

A mallet and chisel are helpful in pruning V-crotches. They are especially helpful in removing excess wood and bark to insure proper healing.

Much pruning requires climbing the tree to make the proper cut. Many crews have elaborate power equipment to lift them to the desired height. These aerial lifts, towers, buckets, or "cherry pickers" not only lift the operator but often are equipped with pneumatic (air) or hydraulic (oil) powered shears to do the cutting.

The average homeowner oftentimes cannot afford to have someone with this equipment come in to prune one tree or a few trees. He may purchase a leather or rope safety sling and a high quality 1/2 inch climbing rope. (He should also have rope to help lower the larger branches.) This sling or saddle and rope is then used to aid him in climbing the tree. When he reaches the branch to be removed he then can tie the rope and proceed to remove the branch. If necessary he can use the rope and saddle as a swing to get out of danger in case of an accident.

Further information on pruning trees can be found in "Pruning Shade Trees and Repairing their Injuries", USDA Home and Garden Bulletin No. 83, "Shade Tree Pruning", United States Department of Interior Tree Preservation Bulletin No. 4, and "Rope Knots and Climbing", United States Department of Interior Tree Preservation Bulletin No. 7.