
Pruning Shade Trees in the Landscape

Introduction

In general, prune shade trees in the spring prior to budbreak. Specimen trees do not need pruning each year, with crabapples being the exception.

Extensive pruning during shoot growth and leaf expansion in late spring/early summer can place a tree under stress. Summer pruning may stimulate succulent growth and delay the hardening-off process, resulting in greater susceptibility to winter injury.

Dead or broken branches can be removed anytime and removing an occasional limb during fall or winter will have little impact on the growth of a tree. Avoid normal pruning in late fall or winter when the healing process is inactive. Pruning at this time may cause tissue to die at wound sites.

Although sometimes unsightly, bleeding from pruning wounds is normal and is not an indication of harm to the tree.

Pruning Tools

Pruning tools for trees are selected according to branch size. Keep all tools as sharp as possible.

Pruning shears have limited use in pruning small trees because they will only cut branches up to ½ inch in diameter. There are two styles of hand shears: bypass (scissor action) and anvil (one blunt blade). The scissor style usually costs more but makes cleaner, closer cuts. The anvil type is faster, which is only important when pruning evergreens.

Lopping shears have long handles and are operated with both hands. They are used in cutting up to 2-inch diameter branches on crabapples, hawthorn, and other small trees.

Pole pruners are important for thinning tops of trees. The cutter is on a pole and is operated by pulling a handle or rope. Poles are either telescoping or joined together in sections. Fiberglass or plastic poles are best because they are lightweight and safer around electric wires. Poles can be fitted with saws but these are often cumbersome.

Pruning saws come in many different styles. The cutting edge of a saw is measured in points (teeth per inch). An 8-point saw, such as an apple saw, is most desirable for delicate, close work. Most saws have 6 points, while 4½-point saws are commonly used for heavy limbs.

A fixed-blade saw with a leather holder is safer and easier to use than a folding saw. Folding saws usually require adjustment with a screwdriver. Saws with a protruding wing nut can scar the trunk during pruning. A folding saw may also collapse, injuring the operator's fingers.

Hand saws have either straight or curved blades; many pruners prefer a curved blade that cuts on the draw stroke.

A double-edged saw has fine teeth on one side, coarse on the other. This is difficult to use in densely-branched plants. Bow saws are effective when there are no branches within one foot above the branch to be cut. Chain saws are best suited for tree removal. ***Only experienced operators should use chain saws for tree work.***

Trees Need Training

Nursery customers demand trees with a full crown and many branches, so nurseries and garden centers practice minimal pruning. Therefore, responsibility for developing a tree with proper branch structure falls to the educated home landscaper.

Select trees from the nursery that will not require severe pruning. Unless trees are selected for their unusual growth habit or special effects, they should have a straight trunk with evenly spaced branches that grow in different directions. (See Figures 1 and 2.)

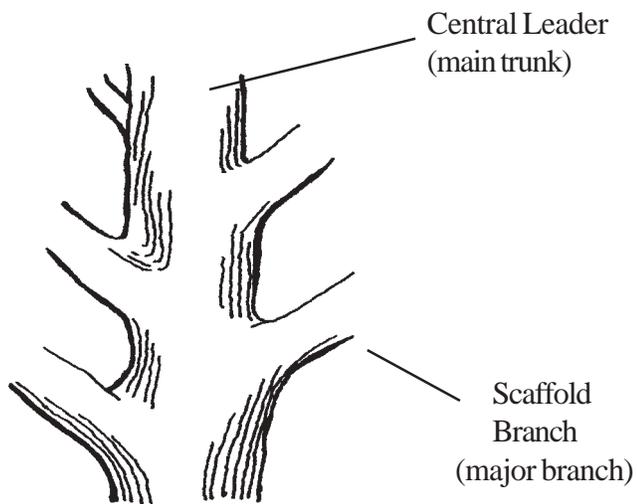


Figure 1. Vertical Branch Spacing - Scaffold branches spaced greater than 12 inches apart will promote dominance by the central leader.

Do not prune trees at planting or during the first year of growth because growth regulators found in growing shoot tips are needed for root development and early establishment. One year after planting, begin training to achieve good vertical branch spacing and radial branch distribution.

Closely spaced scaffolds may restrict growth of the central leader, while simultaneously encouraging a branch to become the new leader. Space scaffold branches on mature shade trees from 12 to 20 inches apart vertically, depending on the tree species. Distribute radial branches to allow 5 to 7 scaffolds to

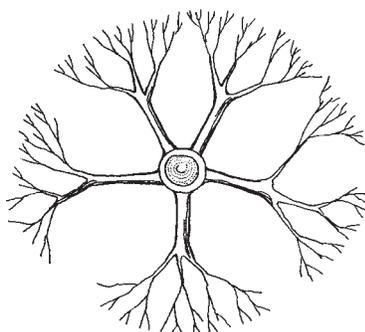


Figure 2. Radial branch distribution - This ideal configuration will increase sunlight penetration.

fill the circle of space around a trunk. (See Figure 2.) Radial spacing prevents one limb from competing with another for light and nutrients.

Limbs are often removed to improve the overall tree shape (feathered look) or to allow more filtered sunlight to reach the lawn below. Certain trees, such as shagbark hickory or white birch, have interesting bark which is exposed by limb removal.

When deciding which branches to remove, select those with less than a 30-degree angle of attachment to the trunk. Branches with the greatest strength with the least potential for storm damage will grow at angles between 60 and 70 degrees from the trunk (See Fig. 3.)

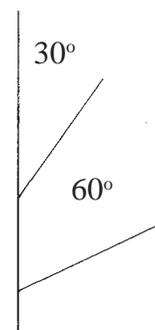


Figure 3. Narrow crotches are weak and prone to splitting when branches have less than a 30° angle of trunk attachment.

The distance from a branch to the ground never changes as a tree grows. The height of the lowest branch from the ground can range from a few inches (for screening or windbreaks) to 10 feet (as needed along a street or patio). Lower limbs are usually removed over a period of years, beginning in the nursery and continuing for several years after transplanting, until the tree has reached the desired height.

Pruning Technique

Begin by making cuts necessary for good tree health, then consider shaping the tree. First remove broken, dead, crossing and pest-infested branches. Remove branches growing vertically (competing with the main leader) and lower branches (that will impede lawn mowing or walking).

When the objective is size control and/or tree shape, encourage small replacement branches that originate at the trunk. Reduce long branches by cutting back to shorter ones. (See Figure 4.)

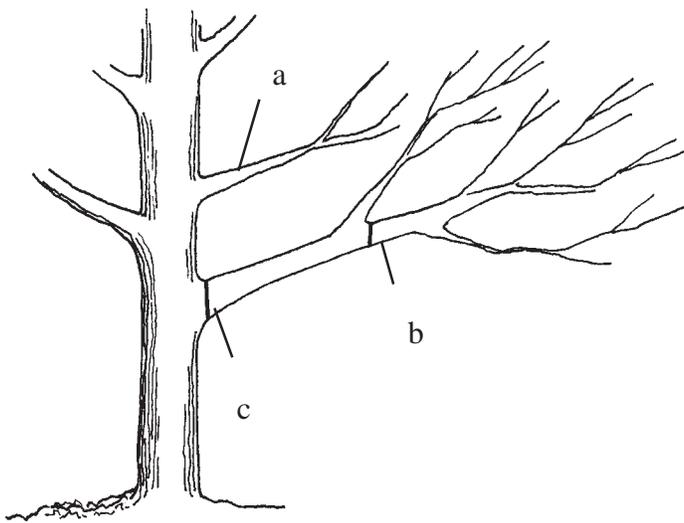


Figure 4. Options for reducing tree size.
 (a) Shorter replacement branch.
 (b) Always remove the weaker lower branch at a V crotch.
 (c) Remove an entire limb if a shorter replacement branch is nearby.

The overall tree shape should allow good sunlight penetration without shade from branches that duplicate or cross. When given a choice always remove the bottom branch, which is the weaker of the two. Leave no stubs. (See Figure 4.)

Branches should never be cut flush to the trunk because of greater exposure to rot organisms. Cutting the tips of current season's growth is another poor practice because it encourages "crows' feet" (multiple branches emerging from the cut tips, resulting in excessive growth and shading).

When removing large branches, make the first cut on the underside about one foot or more from the trunk. (See Figure 5.) Follow through with the second cut on top of the first.

Now that the weight is removed, saw 25 percent of the way into the underside of the branch at the outside edge of the branch collar. Make the next cut on top at the outside edge of the branch collar but away from the bark ridge. If there is no distinct collar, cut branches at a right angle to the branch outside the bark ridge. (See Figure 5.)

By following proper pruning techniques, the bark will not rip when the branch separates from the trunk and the healing process will be much quicker.

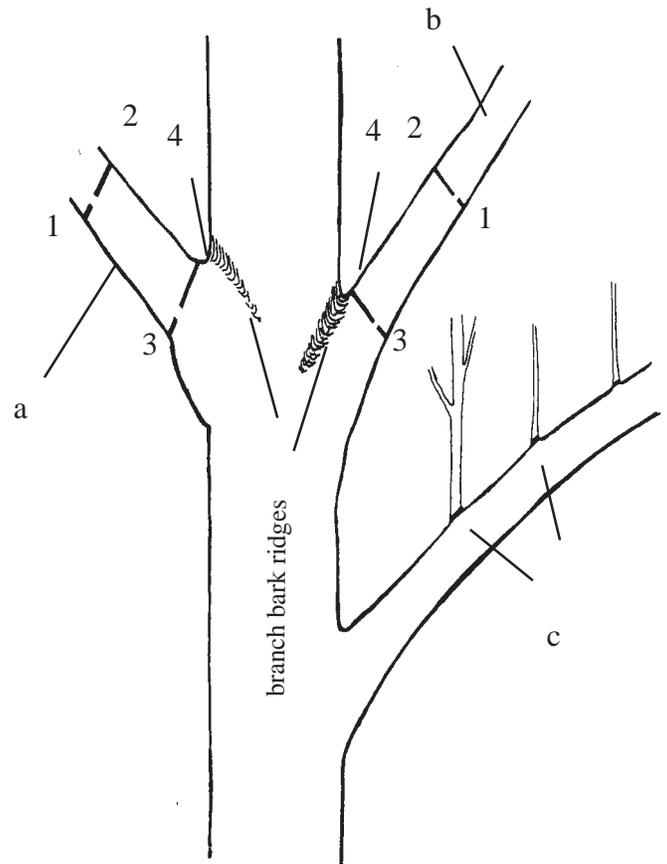


Figure 5. Branch removal
 (a) Take weight off branch by cutting #1, then #2. The final cuts at #3, then #4 will remove the branch at the branch collar without tearing bark down the trunk.
 (b) Reduce weight by cutting off the branch at least 1 foot from the trunk. No branch collar is apparent; therefore, cut at the top of the branch bark ridge and perpendicular to the branch.
 (c) Suckers are two or more years old, branched, and upright. Water sprouts are unbranched vertical shoots.

Do not apply tree paint to pruning wounds. It may interfere with callus tissue formation or predispose tissue to rot organisms.

Normally, one year old water sprouts (unbranched vertical shoots) from crabapple, hawthorn, linden, etc., are removed with a saw in the spring. Trees heavily pruned in the spring usually generate an excessive number of water sprouts. The resulting imbalance between roots and top growth can be corrected by removing water sprouts as they develop during the growing season. (See Figure 5.)

Preventing Storm Damage

Large limbs with narrow crotch angles should be removed or braced with cables. They are best removed entirely or pruned severely to reduce weight when they overhang a house or threaten human life.

Bracing and cabling is a viable option if (1) pruning wounds and invasion by rot organisms are inevitable and/or (2) branch removal will disfigure the tree. This practice involves a lifelong commitment. Branches will continue to grow and the added weight will place greater stress on the “V” crotch. Occasional pruning will maintain desirable branch growth. (See Figure 6.)

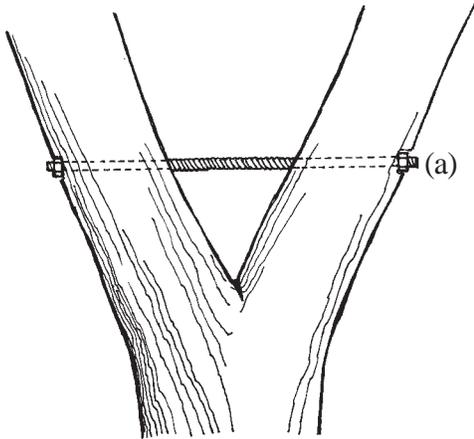


Figure 6. Insert a rigid brace through drilled holes in a double trunk tree to prevent storm damage. Additional cables may be necessary in the tree top for stabilization. (a) Washers and nuts are countersunk by removing a piece of bark down to the wood.

Cabling often uses the main trunk to support a side branch that may break off under the weight of heavy snow or ice. Rigid braces will prevent swaying of the crotches. Do not wrap the trunk or branches with wire or garden hose--girdling and tree decline will result.

A homeowner can install braces and cables in small trees, but we recommend seeking assistance from a professional arborist for larger trees.

Drill a hole through both branches or trunks to be braced, inserting a steel-threaded rod and bolting each end. Countersink the washers below the bark.

Fast-growing trees are usually more brittle than slower growing trees. Although everyone wants instant shade, consider the advantages and disadvantages of growth rate before planting a fast-growing tree. Rapid growers such as Chinese elms, willows, silver maples, poplars and birch usually suffer the most storm damage. Trees considered to have a moderate growth rate with less storm damage potential include maple, oak, linden, and ash.

Think Safety

Wear a hard hat and goggles when pruning, especially when using a pole pruner. When confronted with utility lines, large limbs over houses or extension ladders, consider hiring a professional tree company to do the job.

References

Bedker, Peter J., Plant Pathologist
O'Brien, Joseph G., Plant Pathologist
Mielke, Manfred E., Forest Health Specialist
How to Prune Trees, Bul. NA-FR-01-95, USDA Forest Service, Northeastern Area State & Private Forestry, 1995.

Feucht, James R., Landscape Plant Specialist and Professor, *Preventing Storm Damage to Deciduous Trees*, Colorado State University Cooperative Extension, 1992.

Original fact sheet by David Seavey, UNH Extension Educator, edited & reformatted, 3/01
Illustrations by Karen Holman, Extension Master Gardener

Visit our website: ceinfo.unh.edu

UNH Cooperative Extension programs and policies are consistent with pertinent Federal and State laws and regulations on non-discrimination regarding age, color, handicap, national origin, race, religion, sex, sexual orientation, or veterans status.