



# PRUNING SHADE AND ORNAMENTAL TREES

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Pruning is among the most important of all tree maintenance practices. Proper pruning can reduce damage from storms, insect defoliation, twig and branch disease problems, and weak branch structure, etc. Well-pruned trees are more attractive and vigorous and live longer than unpruned trees. Prompt removal of dead or broken branches is one example of preventing more serious problems through pruning.

## WHY PRUNE?

Some people believe shade trees should be pruned every year whether they need it or not. An extreme example of this is regular pollarding or dehorning every spring (Figure 13, p. 7). This is not usually a good practice. Do not prune, unless needed for a specific reason. There are several good reasons for pruning shade and ornamental trees. Some of the more common follow.

### Improve Appearance

Prune at an early age to train a tree to a desired form or shape. Remove dead, damaged or weakened branches to improve appearance. Remove entire branches or their ends to restore balance to a misshapen tree.

### Maintenance

Prune to maintain health and prevent future problems. Wind storms break branches, and others suffer from disease and insect attack. Both kinds of weakened branches can cause further problems if left on the tree. By promptly removing these branches, insect and disease attacks are often avoided and more rapid recovery by the tree encouraged. Environmental stresses cause weakened or dead branches which may easily become infected if allowed to remain on the tree.

The old adage about an ounce of prevention being worth a pound of cure is also applicable to the pruning of shade trees. Serious injury can be prevented by selective pruning. Prune unnecessary twigs and branches from the crown of a tree to permit air to move through foliage with greater ease. This speeds evaporation of dew and rain water from the leaves, reducing development and growth of leaf fungus diseases. It also reduces the chance of damage from wind storms.

Remove weak, V-shaped crotches, or prune to prevent their development to reduce injury from wind, or from ice and snow accumulations. Rubbing branches are another potential source of trouble. Their removal will prevent the development of wounds which may provide openings for decay fungi.

Pruning to reduce the density of foliage in the crown may occasionally be necessary so grass or other low-growing vegetation can grow satisfactorily beneath the tree.

### Safety

Remove dead branches before they fall, damaging property or injuring someone. Periodically inspect

and prune to eliminate this threat.

It may also be necessary to prune branches that interfere with utility lines. However, **only utility company personnel should prune near wires.** Occasionally, trees are too close to buildings and require pruning to prevent damage to both the tree and building. Or the lower branches of trees may interfere (physically or visually) with foot or vehicle traffic.

## WHEN TO PRUNE

Some say it is possible to prune "anytime the saw is sharp." This expression is not totally correct—some seasons are better for pruning than others.

For most trees, late winter or early spring is the ideal time for pruning. Wounds made by removing branches at this time will begin to develop callus tissue with the approaching growing season. Insect and disease activity is at a low level. Since the tree is dormant, no foliage is removed and the food-producing capacity of the tree is not affected. Finally, absence of foliage makes it easier to get an overall view of the general structure of the tree.

With some species, such as maple, walnut, yellowwood, and birch, loss of sap, or bleeding, will occur from winter and spring pruning wounds (Figure 1). While this is not harmful to the tree, it may be unsightly. To avoid bleeding with such trees, prune in late spring or early summer. This allows time for some healing of the wounds during the current year. Wounds made after July heal very little during the remainder of that growing season.

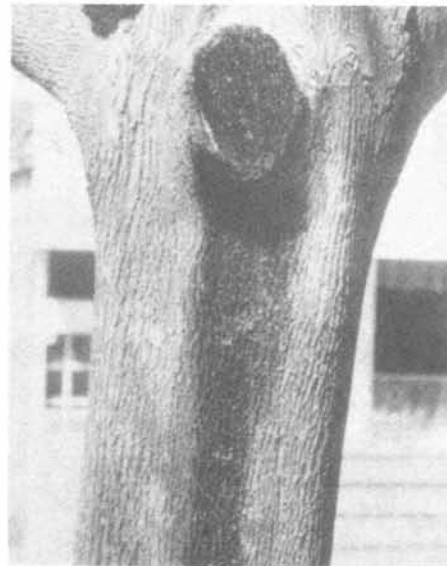


Figure 1. "Bleeding" from a cut made on maple in the spring. Not seriously damaging to the tree but may be unsightly.

If pruning cannot be done during late winter or spring, it may still be done at other times. Obviously, storm damaged trees must be pruned after injury. While the most desirable season for pruning is springtime, serious injury will probably not occur at other times, with one exception: heavy pruning during, or just following the period of active growth in mid-to-late spring. Pruning at this time results in removal of foliage when the food reserves of the tree are low. This may cause injury to the tree, and reduce or prevent complete recovery and development following pruning. However, this can be an effective way to dwarf the tree, if that is the intent.

## HOW TO PRUNE

While each tree should be considered individually, there are some guidelines to follow. The following suggestions apply for nearly all trees. Additional suggestions for evergreens and flowering trees are offered later.

The response of the tree following pruning will vary, depending on where the cut is made. Two distinct types of pruning cuts are possible and the responses to each are noticeably different.

**Heading or heading back** — Branches are cut without regard to location of lateral branches or buds, the result being stubs of varying lengths. This is usually undesirable since it often results in a mass of vigorous growth near the cut (Figure 2). These branches, which are of sprout origin, are weakly attached and short lived. This type of growth is

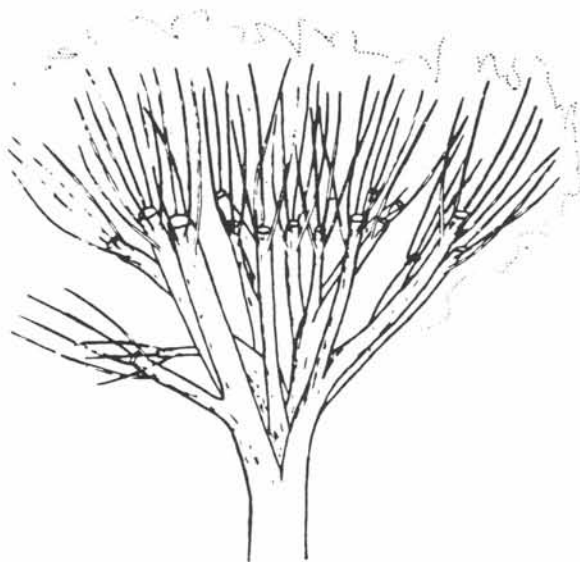


Figure 2. Heading or heading-back. This procedure results in many vigorous, weakly attached branches and the loss of the tree's natural form.

generally undesirable, unless needed to fill in an open area within the tree. Heading is most appropriate for formal shrubs and hedges where dense, uniform growth is desired.

**Thinning or thinning-out** — Removal of a branch back to its point of origin or to a side branch of sufficient size to assume dominance (Figure 3). This is the preferred method of pruning, and may be called "natural" pruning since the overall shape of the tree is not altered. This permits more light to enter the tree and results in the development of stronger branches with reduced sprout growth. New growth tends to be distributed throughout the tree, rather

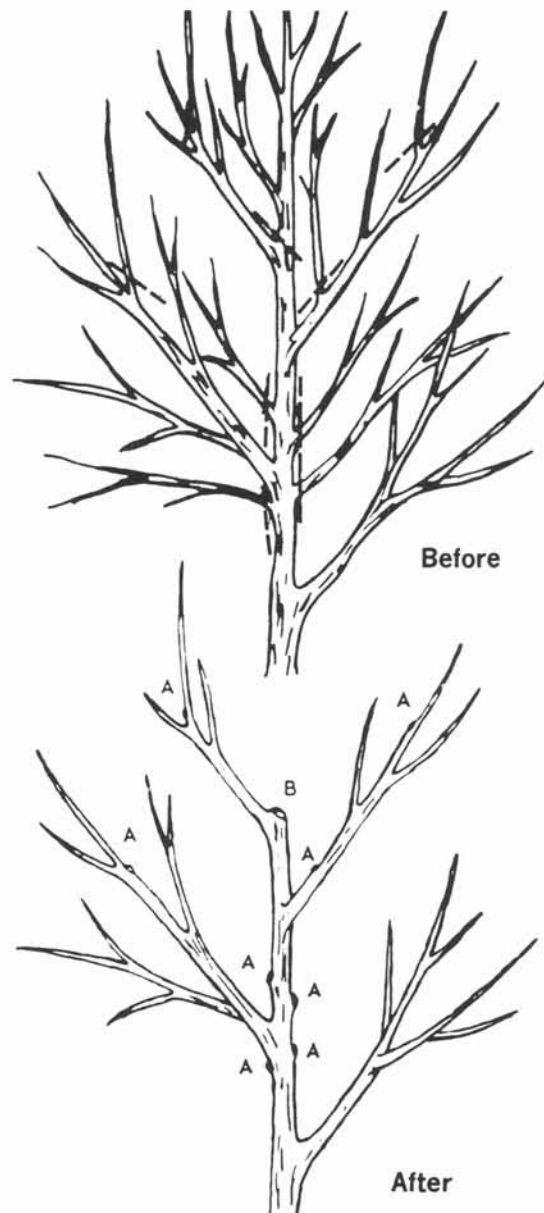


Figure 3. Thinning or Thinning-out. The removal of a branch back to its point of origin permits light into the center of the tree and encourages stronger branches and fewer sprouts.



than in the vicinity of the cut, as in heading.

Make all pruning cuts cleanly. Cut as close as possible to the main stem or parent branch without leaving a ragged, torn wound. The goal is to cut as clean and close as possible, while still producing a minimum wound. Too often, the cut is made some distance from the nearest branch or main stem in an effort to "hurt the tree less," or because it is easier to do (Figure 4). But, the stub which remains usually dies and serves as an entry point for wood-decaying organisms. In contrast, small, close cuts usually heal before decay begins.

### Start at Top

Pruning should generally begin in the upper portion of the tree and progress downward. This makes it easier to maintain the general shape of the tree and permits removal of branches which catch on limbs in the lower part of the tree. While pruning, remove all dead, diseased, or broken branches. Here is a guide for regular pruning:

1. Remove all dead, diseased, and dying branches. These allow wood decay and other injurious fungi to grow and eventually cause injury to the living parts of the tree.

2. Make training cuts to maintain main limb leadership or to remove competing limbs. Also, remove branches that grow toward the center of the tree or branches which rub or cross over one another (Figure 5).

3. Make corrective cuts to eliminate one of the branches in weak V-shaped crotches (Figure 6). If left to develop, these branches become weak and susceptible to breakage. This is because tissue on the inner side of the union or crotch develops in such a

way that supporting wood does not form on the inside. As the branch increases in size and weight, it is highly susceptible to splitting.

4. Remove watersprouts (fast growing shoots which develop from the sides of branches or trunk inside the crown and tend to grow upright through the tree). Watersprouts have little value to the tree and are sometimes considered as parasites since they use more energy than they produce. Watersprout growth often develops into crossing branches if allowed to develop.

Drooping branches are weak and less vigorous and are usually removed unless they are normal for the tree (weeping willow, weeping cherry, etc.)

5. If the tree still appears dense and could be improved by better light distribution, a general thinning may be necessary.

It is always better to train and otherwise avoid problems by careful pruning while the tree is small rather than waiting until it becomes larger. Small wounds heal more rapidly than larger ones. It is also better to prune lightly and often, rather than making infrequent, heavy pruning cuts.

Use hand pruning shears (Figure 7) to remove small branches ( $\frac{1}{2}$  to  $\frac{3}{4}$  inch). Larger branches require lopping shears (Figure 7C) or a pruning saw (Figure 8). Various types of saws can be used. They are usually curved, with teeth positioned to cut on the pull-rather than the push-stroke. Since footing is often less than ideal, cutting on the pull stroke provides more balance, strength and safety. Chain saws can be used in tree trimming but are more dangerous when working in an elevated position and should be left to experienced trimmers.

To cut branches some distance from the ground, use a pole pruner (Figure 9). Saws can be pole-



Figure 4. Branches should never be cut off with a large stub remaining. Rot may easily enter the tree through such a stub (right).



Figure 5. Rubbing branches may result in wounds that permit entry of decay organisms. Removal of one is usually best remedy.

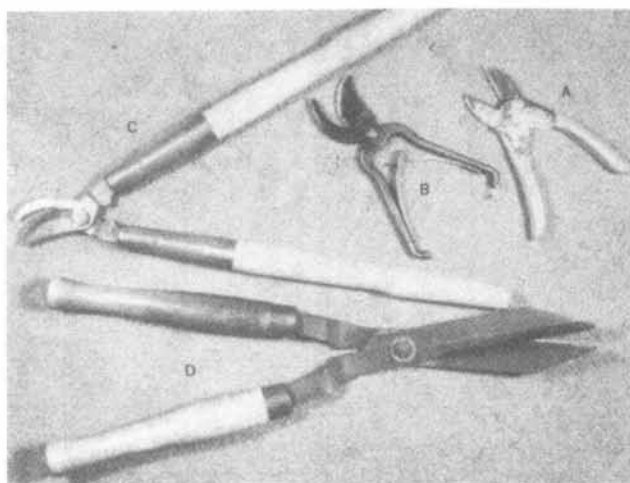


Figure 7. Pruning shears. (A) Anvil action, (B) Scissor action, (C) Lopping shears, (D) Hedge shears.

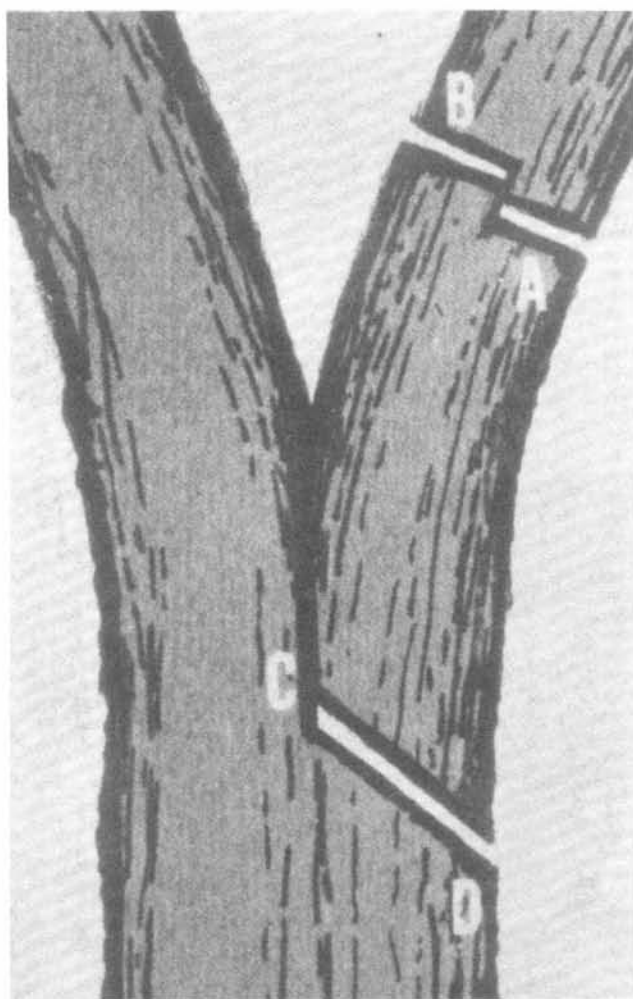


Figure 6. Weak V-crotches should be removed when small. Larger branches should be removed with a cut at approximately  $45^{\circ}$  from D to C, the actual branch junction. Wood formed above C is not supportive since it never truly joins. Cuts A & B refer to 3-cut method for removing large limbs. (See Figure 10.)

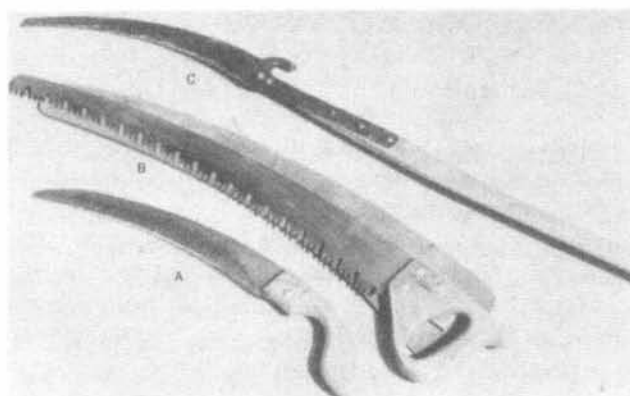


Figure 8. Pruning saws. (A) Folding pruning saw for fine cuts, (B) Coarse-toothed for larger cuts, (C) Pole saw for sawing beyond normal reach.

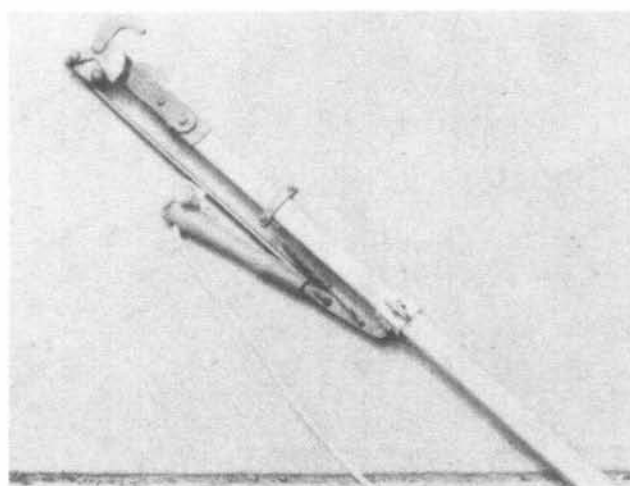


Figure 9. Pole pruner effective for cutting small branches at up to 15 feet distance. Essentially hand- or lopping-shears mounted on a pole and activated by a pull-rope.

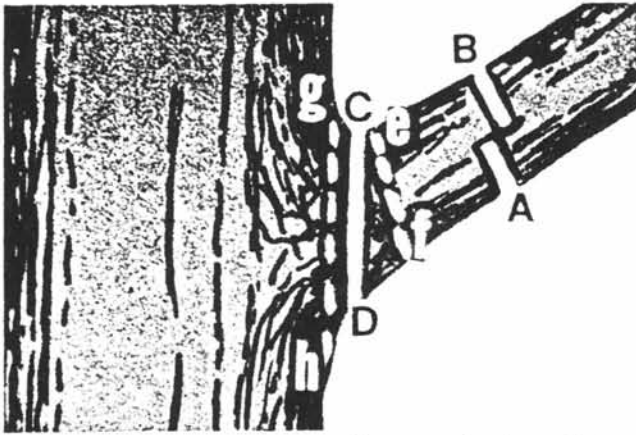


Figure 10. The three-cut method for removing large limbs: (A) first cut, (B) second cut, (C-D) final cut. Broken lines (e - f) stub too long; (g - h) cut too deep. Both e - f and g - h will require extra time to heal.

mounted (Figure 8C) to cut larger limbs than the pole pruner. Make all cuts as close as possible to the main stem. Never leave stubs.

### 3-Cut Procedure

Remove large branches in a 3-cut procedure to minimize injury to the tree. To prune a branch in this manner, make the first saw cut about 1 to 2 feet from the main stem on the underside of the branch, about halfway through. Make the second cut on the upperside of the branch, slightly beyond the undercut. When this cut nears the first cut, the branch will fall. Make the last cut nearly flush with the main stem

(Figure 10). With large branches, a small ledge may be left on the upperside and a slightly larger ledge on the bottomside. A minimum-size wound, without leaving a stub, is desired. The correct location for this final cut is called the branch collar or shoulder. If the 3-cut method is not followed on large branches, the falling branch will likely rip the bark with considerable injury to the tree (Figure 11).

Ragged, irregular, or large circular-shaped wounds can be reshaped to resemble an elliptical shape which encourages rapid healing (Figure 12). This is desirable since new callus tissue develops from the sides and not from above and below the wound. These wounds may be increased in height with minimal damage; however, an increase in width will slow healing.

Occasionally, a tree is pruned very severely, leaving only a few main branches. This is called **pollarding** or **dehorning** (Figure 13) and is used to reduce the size of the tree and to "thicken up" the foliage. Unfortunately, it produces large, slow-healing wounds and many weakly attached branches. Also, some of the larger branches may die and decay can eventually progress into the main stem. Although some fast growing trees such as silver maple, Chinese elm, and willow, will respond to this treatment, it is not recommended except in unusual situations.

### Evergreens

In general, evergreens do not require as much pruning as deciduous trees. Evergreens can be

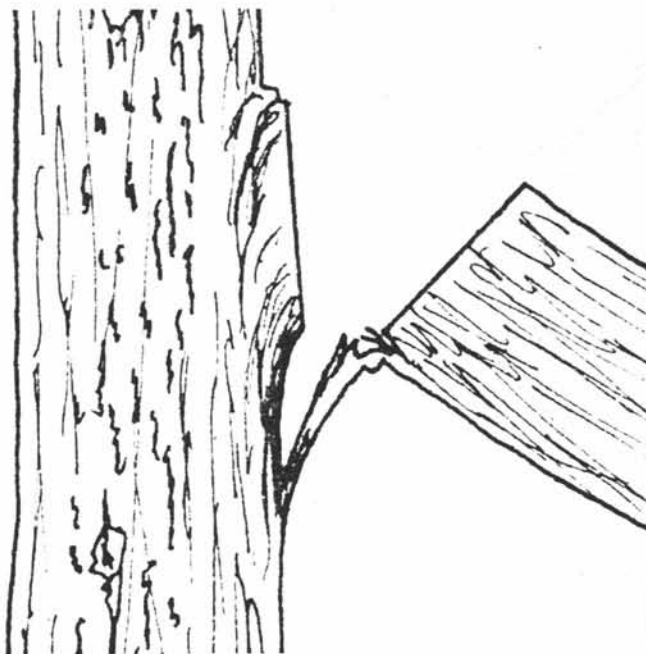


Figure 11. Failure to properly remove a large branch by the three-cut method may result in the heavy branch falling and tearing. The extra wounding may take several years to adequately heal (right).



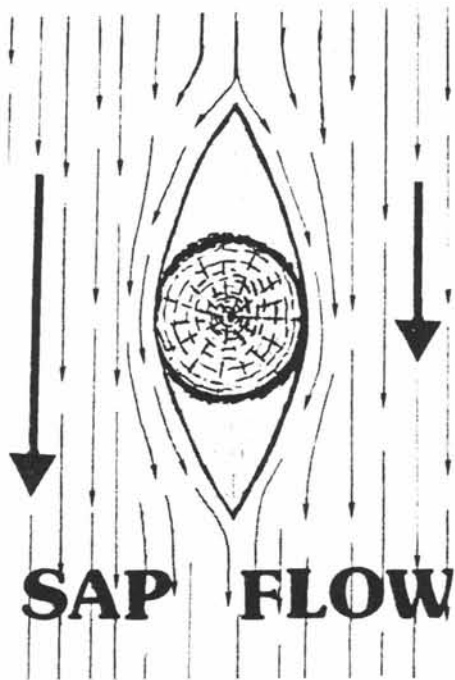


Figure 12. Large wounds may benefit from tapering at both ends to take advantage of normal sap flow around a surface wound. Wounds should never be widened in shaping.

PRUNED according to previous suggestions, especially the larger branches. To TRAIN or SHAPE the tree, the recommendations are somewhat different. The location of buds, and thus the position from which new growth develops differs from hardwoods, and among various species of evergreens. With such species as yews, junipers, arborvitae, hemlock, and cedars, foliage may be cut at any location and new growth will develop. These species are frequently sheared to maintain desired shapes. Prune before new growth begins in the spring so that unsightly cuts are quickly covered.

Most other conifers will not respond in the same way. In general, prune them during early summer and prune only the current season's growth, if possible. Never cut conifers back to wood lacking any needles (leaves).

Some conifers, especially spruce and fir, often produce competing leaders. Unless aesthetically desirable, one should be removed. If the central leader is lost or damaged, one of the next lowest branches can be favored by tying to a splint to produce another good leader (Figure 14).

Pruning cuts on pines can be made anywhere needles are present. Buds will form below the cut. With spruces, firs, and Douglas-fir, prune immediately above a lateral bud (Figure 15), which will form the new growth for the branch.

### Flowering Trees

Flowering trees occasionally need pruning to remove weak or dead branches, branches which rub each other and branches which grow toward the



Figure 13. Pollarding, or dehorning results in an unnatural appearance for the tree and should be used only in unusual cases as necessary for some specific objective.

center of the tree. Following the flowering period, remove excess growth such as interior shoots or watersprouts. Heavy pruning, like heavy fertilization, encourages foliar growth and reduced flower production. Minimal pruning, consistent with maintaining the tree in a healthy condition, will produce maximum flowering.



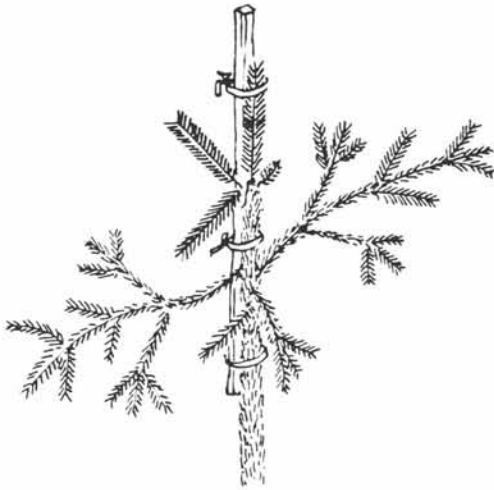


Figure 14. Method of encouraging young side branch of an evergreen to form a new leader. The branch is held upright by a splint.

## TREATING OF PRUNING WOUNDS

To reduce the chance of disease, treat pruning wounds, especially those larger than 1 to 2 inches in diameter. Most smaller wounds will heal rapidly and a wound dressing is not required. Since larger wounds heal slower, they are likely to dry and get check cracks. The unprotected wood is exposed to boring insects, disease organisms, etc. for a longer period. Treating the wound can help prevent this.

Many materials have been used for wound dressings. However, commercial tree paints are recommended. These are available in either a liquid paint or aerosol form. A good practice is to paint the wound with orange shellac before applying tree paint. The alcohol in the shellac provides a good sterilizing compound and the shellac provides a good base for the paint. For larger wounds, repeat this treatment every 2 to 3 years until new bark covers the wound. The dressing must be applied so that cracks do not provide moist, protected entry points for insects and diseases.

## DISPOSING OF PRUNING WASTE

What to do with the material removed in pruning may be a problem in some communities. Most wood waste has traditionally been burned, but many cities have banned outdoor burning to reduce air pollution.

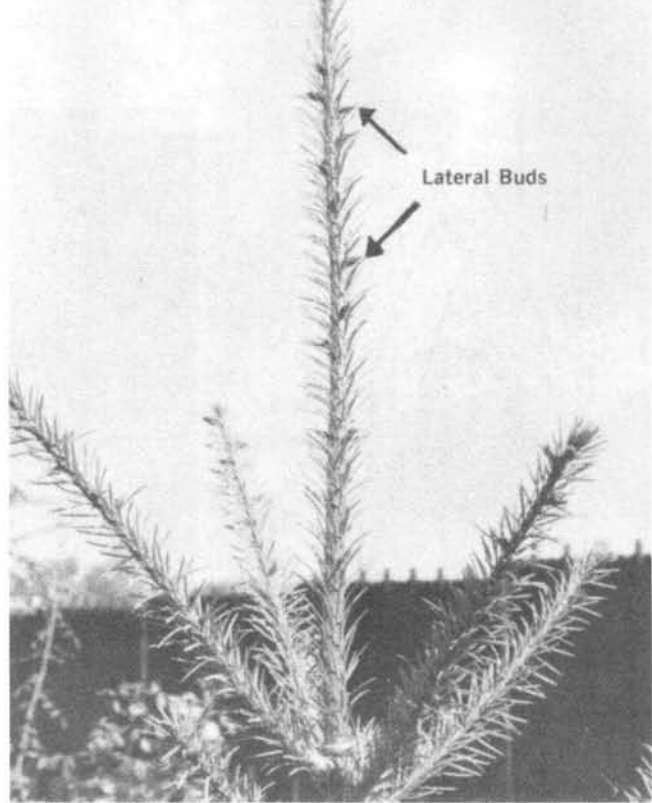


Figure 15. Spruce fir bud location. When pruning spruce and fir, cuts should be made immediately above one of the lateral buds.

Where burning is permitted, remember to observe local fire regulations and obtain the necessary permit.

If wood cannot be burned, landfills or dumps are sometimes available. Their use is usually restricted to local residents on a fee basis.

The larger material removed in pruning can be made into firewood and used by the homeowner. Make small twigs and branches into kindling. In some areas, chipping equipment is available to convert wood debris into chips for use as compost, ground cover, or other landscape purposes.

## CAUTION

A special word of caution. Saws and other cutting instruments are sharp and should be treated with respect. Assume that any electric-type wires through the tree are "hot." Most pruning tools are excellent conductors and contact of the tool with the wire can be fatal. For this reason, utility companies prefer to prune all branches interfering with their wires. Care must be taken when working in trees. Use a safety rope at heights above 10 feet. Further information on the use of ropes in climbing and tree work is available from the U.S. Department of Interior, Tree Preservation Bulletin No. 7 available from the Superintendent of Documents, Washington, DC.