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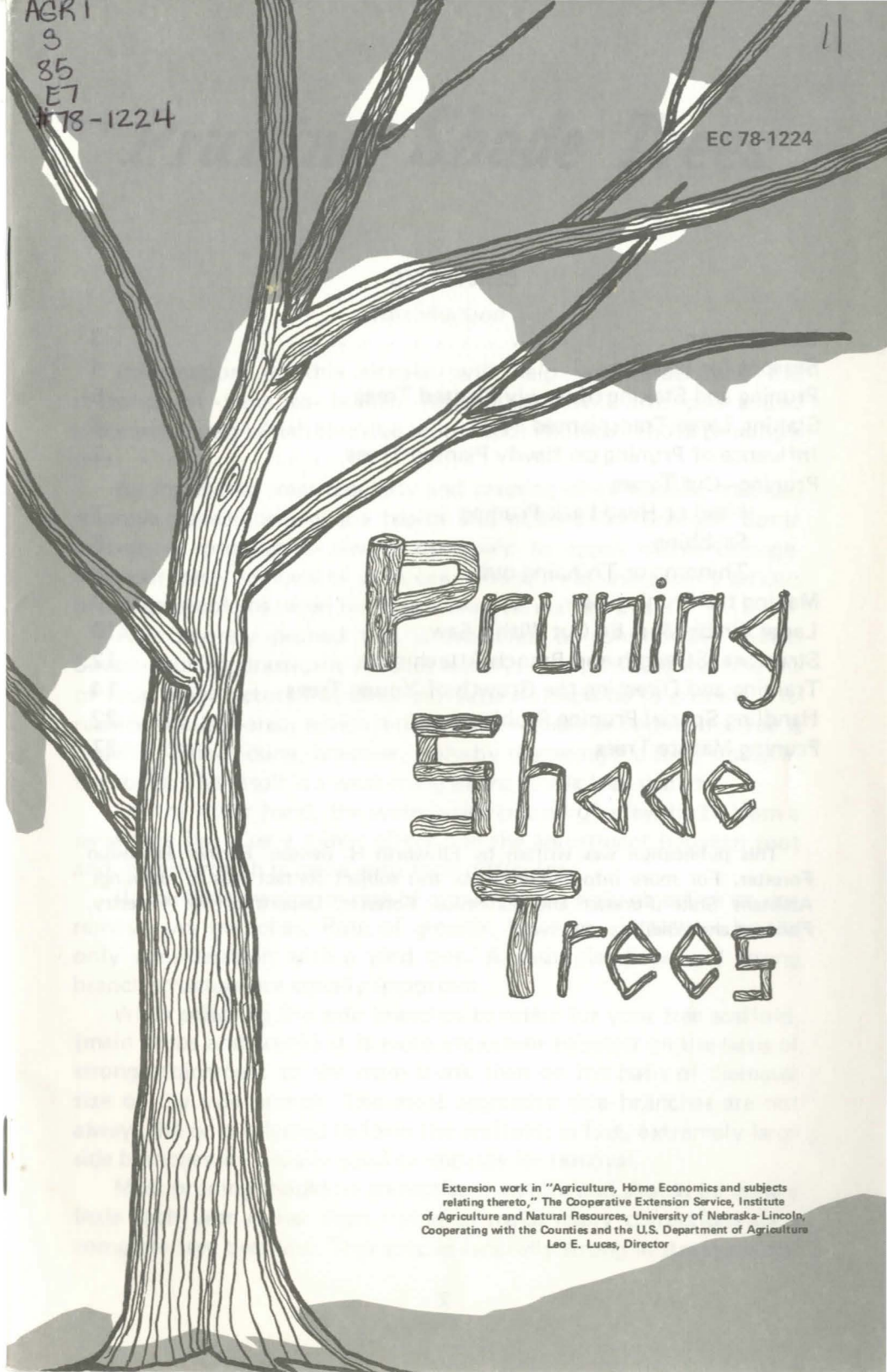

Pruning Shade Trees

Extension work in "Agriculture, Home Economics and subjects relating thereto," The Cooperative Extension Service, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, Cooperating with the Counties and the U.S. Department of Agriculture
Leo E. Lucas, Director

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Pruning Shade Trees

Introduction

Information in this circular will help you understand the response of trees to branch removal and will give you sound principles upon which to make on-the-spot decisions about pruning a tree.

By inspecting trees regularly and pruning when needed, you can improve appearance, guard health and make them stronger. Some emergency pruning is always necessary to repair storm damage. However, early removal of weak branches will eliminate many serious breakage problems when the tree attains its mature size.

Any severely pruned tree is subjected to considerable shock. Severe pruning drastically reduces leaf area, thus limiting the amount of food manufactured by the tree. Nature's response to pruning is to replace the leaf area, which it does quite rapidly providing the tree is healthy. This is done, however, only by depleting the food stored in the roots. The result is a weakening of the whole tree system.

On the other hand, the systematic removal of a few limbs from a large tree has a very minor effect and the adjustment between root and crown growth is made with little difficulty.

If you have maximum rate of growth as the only objective do not remove any branches. Rate of growth, however, should not be the only consideration with a yard tree. A desirable shape and strong branch structure are equally important.

When selecting the side branches to retain for your tree scaffold, (main limbs and trunk) it is more important to select on the basis of strong attachment to the main trunk than on the basis of diameter size of the side branch. The most aggressive side branches are not always the ones selected to form the scaffold; in fact, extremely large side branches are usually good candidates for removal.

Most pruning should be corrective in nature and should be done a little each year rather than trying to make many corrections by a complete tree overhaul. Tree species naturally strong in structure and

regular in shape and form will need a minimum of limb removal other than cutting out dead material.

Trees with diffuse branching habits will need more attention the first 20 years of their life to establish a strong crown structure capable of supporting the heavier and more rambling type of crown which will develop as the tree grows older (Fig. 1). Do this by retaining scaffold branches which are strongly attached to the main trunk and by cutting out those which are weakly attached. Branches selected for permanent scaffolds should have a wide angle of attachment with the trunk.

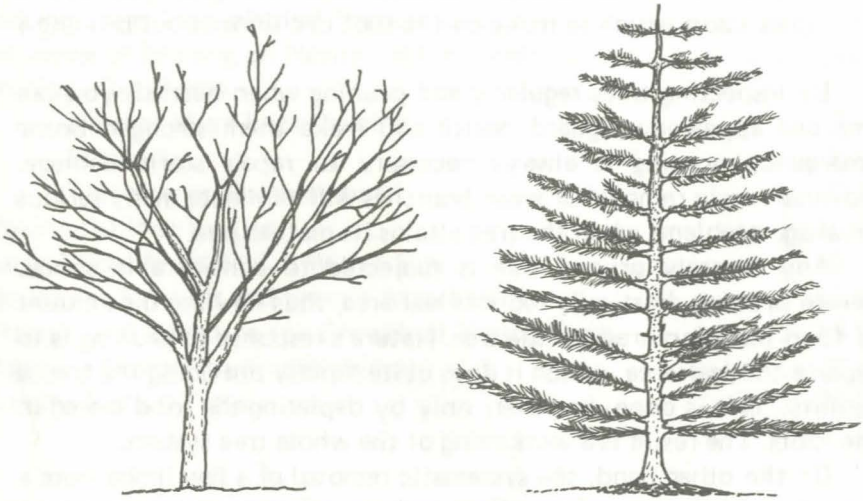

Figure 1. The diffuse branching habit of the type of tree on left needs more maintenance than the one on the right.

Seasons for Pruning

Deciduous shade trees may be pruned at any season. Pruning while the tree is in leaf is as good a time as any, because you are better able to visualize the effect that pruning will have on the tree form.

There are several kinds of trees, however, which should be pruned while they are in full leaf. Birch, maple and walnut are examples of species which "bleed" excessively if pruned during the winter or early spring when bare of leaves.

Shearing operations to shape pine should be confined to the current season's growth and limited to about six weeks during early

summer. This period in Nebraska is usually from June 15 to Aug. 1. All other evergreens can be pruned at any time during the year. This circular does not cover the shearing and pruning of evergreens.

Pruning and Staking of Newly Planted Trees

Much of the tree stock you buy from nurseries will have a relatively small trunk diameter in comparison to height and will need support (Fig. 2). In supporting a tree, keep the following in mind:

1. Stake a young tree so the top is free to move. The main stem will gain strength faster if the tree is not held perfectly rigid and can bend with the wind above the tie.

2. Make the tie as low as possible on the trunk but high enough to hold the tree upright under calm conditions. Under windy conditions the tree should return immediately to the vertical after the wind has stopped blowing. The strength of the trunk will determine how high the tie is made.

3. The two stakes and trunk of the tree should be in perfect line. Drive stakes solidly into the ground, placing them about 18" from the tree.

4. Stakes should be made from good quality 1" x 2" lumber. They should be long enough to allow 18" under the ground and to make the support tie at the proper height.

5. Remove surplus length of stake above the tie to avoid possibility of injury to the bark of the tree by the end of the stake in windy weather.

6. Support tree by using a tie at one level only. Strong rubberized tie material is best.

7. Use support stakes and tie for the shortest possible time.

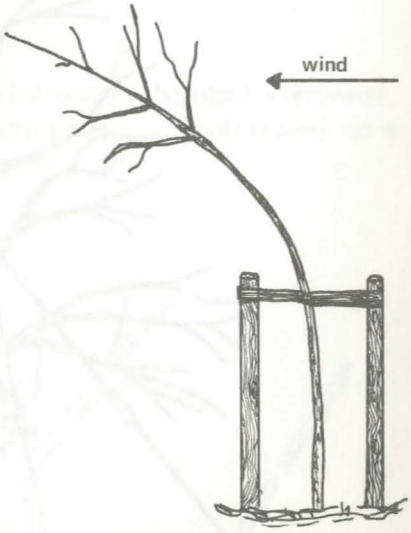

Figure 2. Tie height should be as low as possible but yet high enough to hold the trunk upright. Use rubberized tie material strong enough to provide some flexibility but do not permit trunk to rub against the stakes.

Staking Large Transplanted Trees

Larger trees may need anchoring until their roots grow into the soil. A system of three guy wires similar to that shown in Fig. 3 is a good way to give the tree support until it is firmly established after transplanting.

Protect the tree trunk at the point where guy wires are attached. Several thicknesses of a rubber inner tube wrapped around the tree at this point are often used. The attachment point should be about 2/5 the height of the tree from the ground. Guy wires in lawns can be attached to ground anchors below the surface with detachable hooks and eyes or removal pins to make lawn maintenance easier.

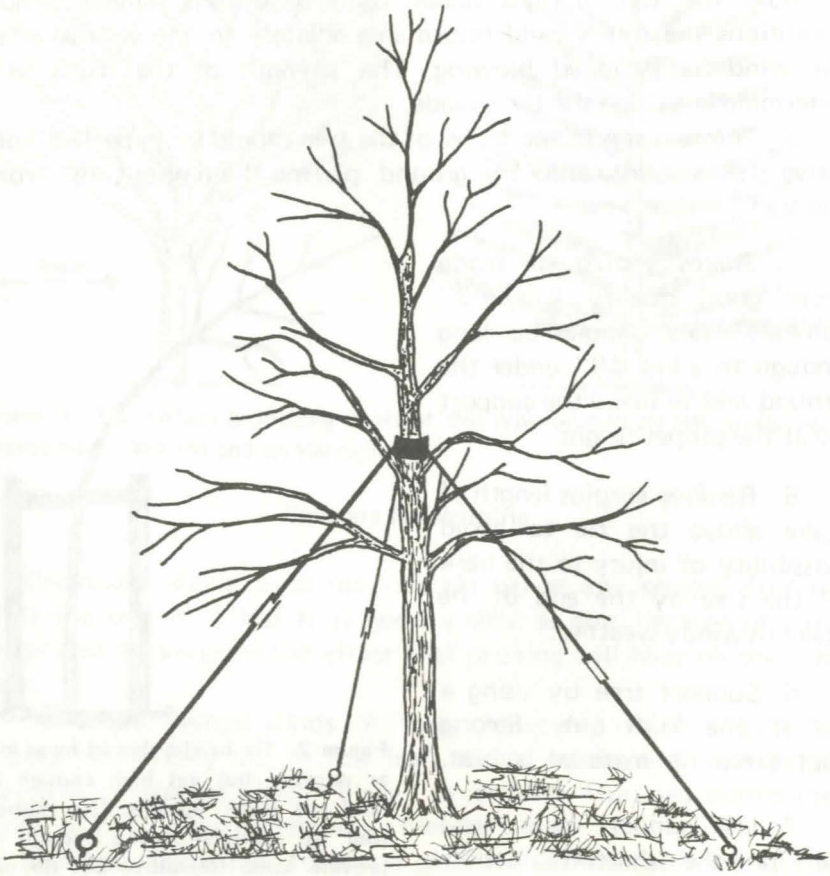

Figure 3. Supporting the large transplanted tree.

Influence of Pruning on Newly Planted Trees

A combination of minimum staking and leaving shoots along the trunk of a young tree, produces a tree best able to withstand the elements. Shoots along the trunk protect the trunk from sunburn injury and will encourage less height growth and more trunk diameter growth, all of which are desirable during the young tree's life.

At the time of transplanting, remove all branches that cross or rub other branches. Smooth the ragged ends of any broken parts.

If the tree has been dug carefully and handled properly, no other pruning will be needed.

If the roots have been damaged considerably, prune off about a third of the length of twigs and small branches to compensate for loss of roots. Cutting off one-half inch of the ends of the roots to expose live root tissue is a good practice to follow in transplanting all trees.

Pruning-Cut Types

Head or Head-Back Pruning

The type of pruning cut you use influences the plant's response. Head or head-back pruning means cutting back a small branch to a lateral bud or small lateral branch (Fig. 4).

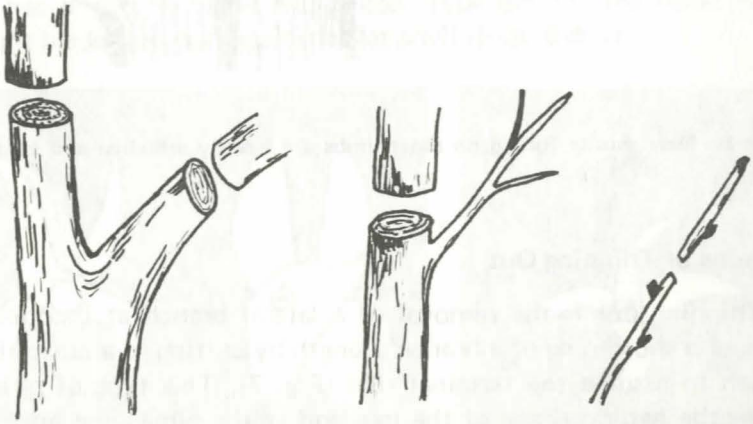

Figure 4. New growth comes from one or more buds near the cut and is vigorous.

Stubbing

When large branches on mature trees are headed, the practice is called stubbing. A number of shoots develop at the ends of each stub (Fig. 5). These shoots are weakly attached to the stem and split out easily (Fig. 6). Trees headed or topped in this fashion lose their natural form and the stub ends are subject to decay. Stubbing is a generally unsatisfactory method of handling tree maintenance.

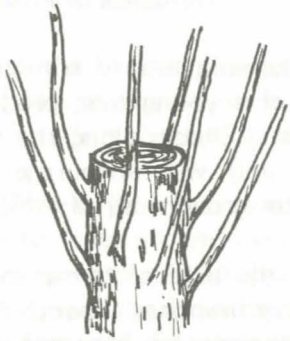

Figure 5. Vigorous, upright growth stimulated by heading.

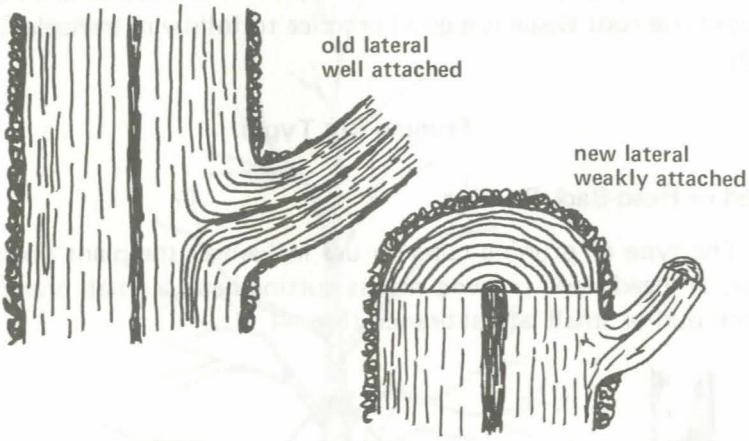

Figure 6. New shoots forced on older limbs are weakly attached and split out easily.

Thinning or Thinning Out

Thinning out is the removal of a lateral branch at its point of origin or a shortening of a branch's length by cutting to a lateral large enough to assume the terminal role (Fig. 7). This type of pruning retains the natural shape of the tree and at the same time opens up the top so more light can penetrate through the tree. The result is that the foliage will be more vigorous and grow deeper into the tree.

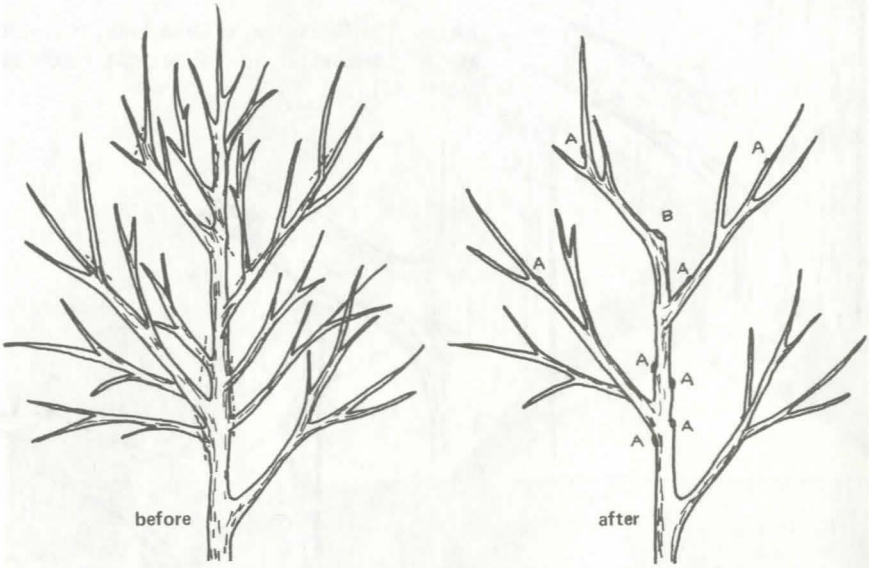

Figure 7. Thinning-out removes a branch (A) or cuts to a large one (B).

Making The Pruning Cut

Pruning shears are for cutting small limbs. There are two types. One has a curved blade and scissor type action, the other has a straight blade that cuts against a flat anvil (Figs. 8 & 9)

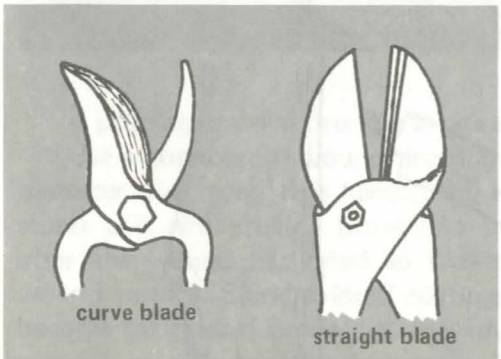

Figure 8. Pruning shears.

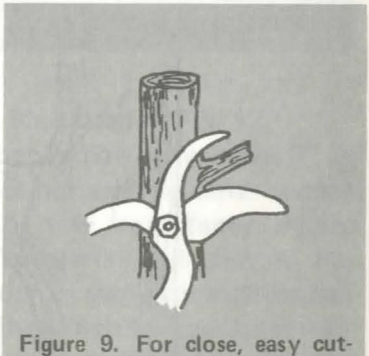

Figure 9. For close, easy cutting, place blade next to trunk and cut up.

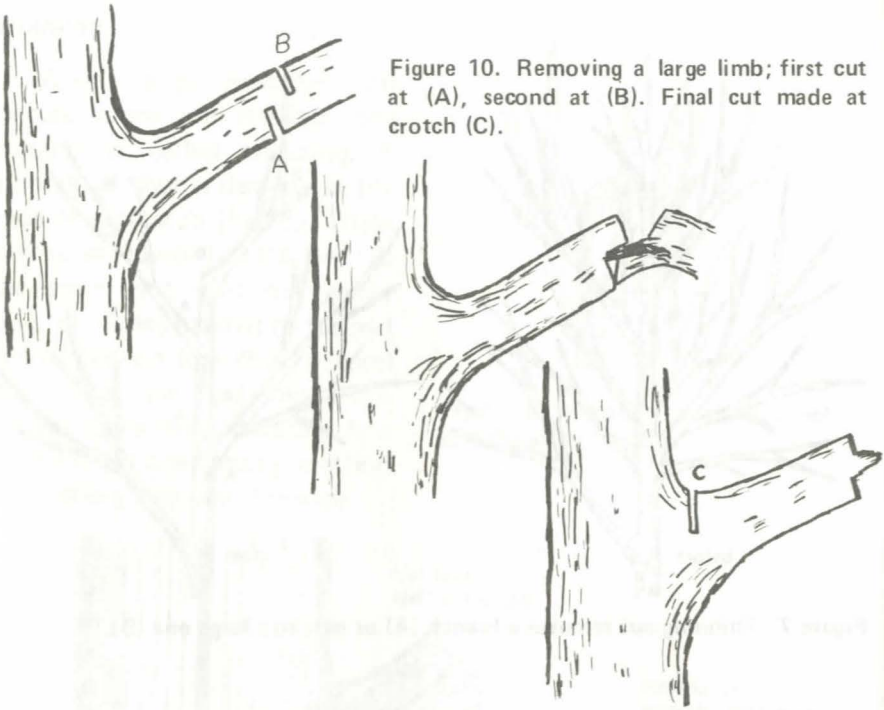

Figure 10. Removing a large limb; first cut at (A), second at (B). Final cut made at crotch (C).

Large Limbs Must Be Cut With a Saw

The recommended procedure is to remove a large limb in two steps involving three cuts as shown in Fig. 10. Damage to the main stem will be avoided by following this procedure.

The final cut will not be perfectly parallel to the trunk but will be out from it slightly with the lower edge of cut farther away from the trunk than at the top (Fig. 11). Such a cut will form a smaller wound than a flush cut.

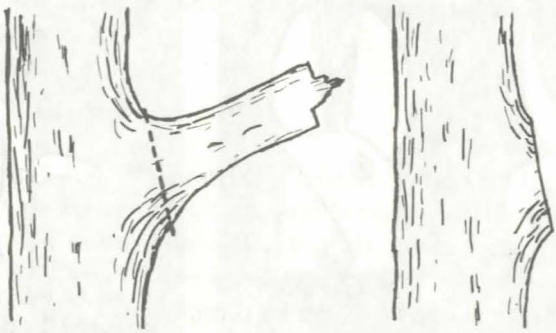

Figure 11. Final cut made at shoulder rings.

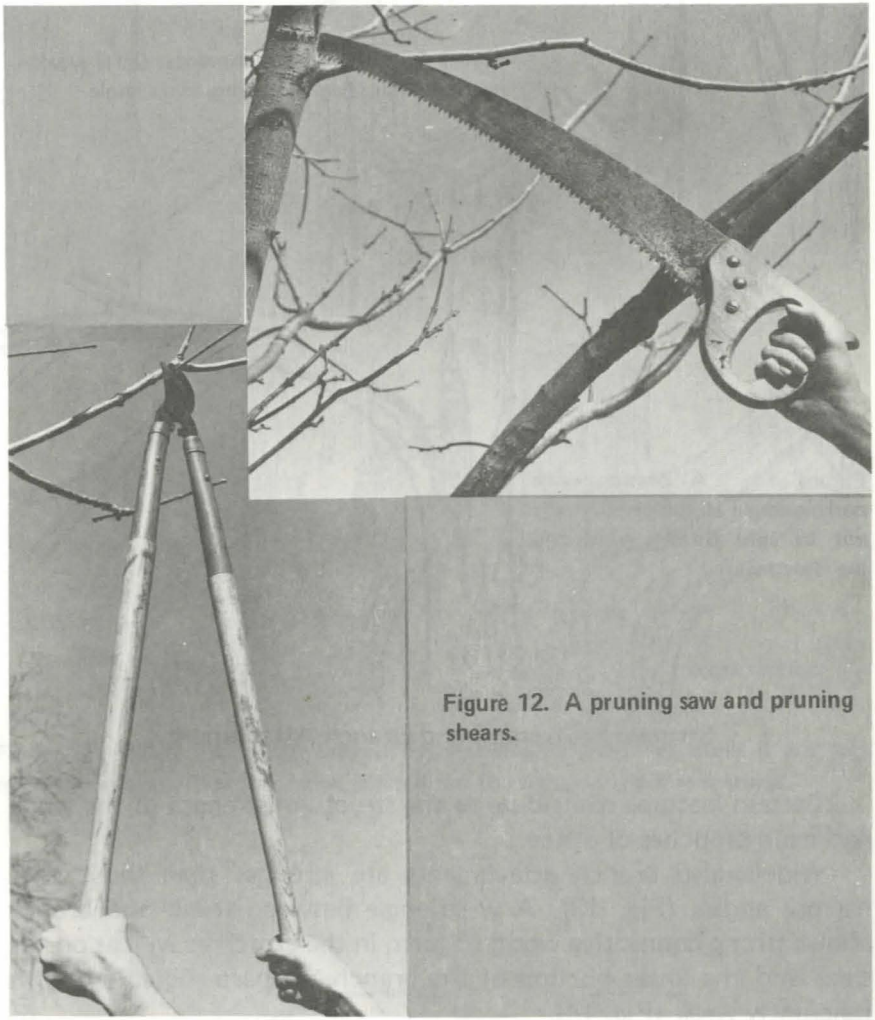

Figure 12. A pruning saw and pruning shears.

A pruning saw and pruning shears are illustrated in Fig. 12.

Use a commercial wound dressing when removing branches 3" in diameter and more. It is handled by most nurseries or other supply stores and will provide protection to the tree from decay. Apply after the wound has dried so that the material will stick to the wound surface. Black colored coatings such as asphalt emulsions can become very hot if exposed to the sun. These high temperatures may prevent or reduce callus formation. To reduce this risk, paint the dried asphalt with a white water-base paint.

Figure 13. Branch attachments: (left) weak, narrow angle; (right) strong, wide angle.

Figure 14. A branch with narrow-angle attachment is very apt to split during wind and ice storms.

Structural Strength and Branch Attachment

Certain features contribute to the structural strength of the trunk and main branches of a tree.

Wide-angled branch attachments are stronger than those with narrow angles (Fig. 13). A wide angle between trunk and branch allows strong connective wood to form in the crotch as well as on the sides and the lower portion of the branch. A sharp-angled crotch is inherently weak (Fig. 14).

For greatest strength lateral branches should be smaller than the trunk or branch from which they arise (Fig. 15).

When a tapered trunk bends, the curvature is fairly uniform throughout its length and permits a more uniform distribution of stress. Tops of well-tapered trunks bend under the wind farther from the vertical than those with less taper, reducing the danger of broken trunk or other deformation from exposure to the wind and uneven stress distribution (Fig. 16). During the growing season, the tip of the leader may bend so far that it is parallel to the wind load. This relieves almost all stress on the immature wood of the tip.

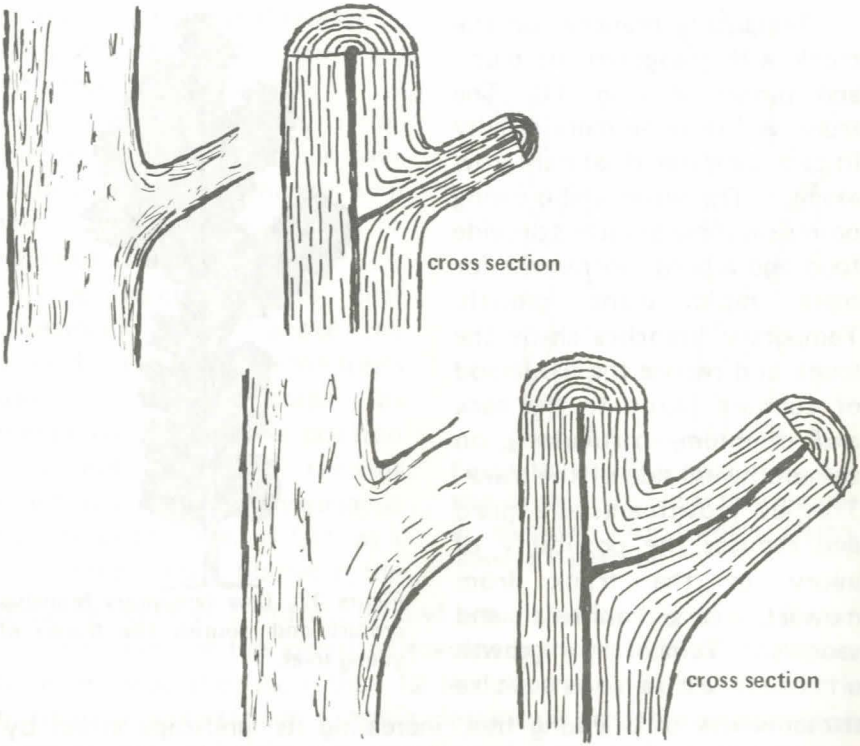

Figure 15. When the lateral branch (left) is smaller than the trunk it will be relatively stronger than the larger branch (on the right) as the tree matures.

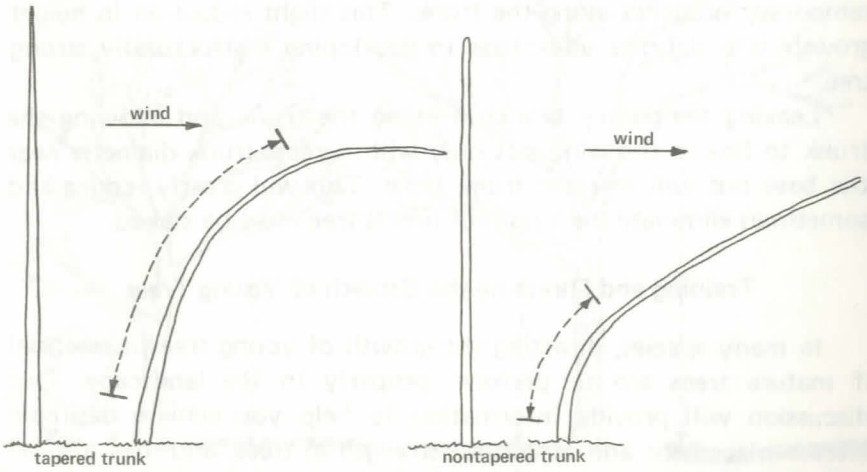

Figure 16. Tapered trunk bends with uniformly distributed stress. Trunk with little or no taper bends with stress concentrated near the base.

Temporary branches on the trunk will strengthen the trunk and protect it (Fig. 17). The trunk will increase more rapidly in base diameter if laterals grow along it. The leaves and growing points on these branches provide food and auxins (hormones) for more rapid trunk growth. Temporary branches shade the trunk and reduce the likelihood of sunburn injury to the bark and cambium, particularly on the southwest side of the trunk. This low growth acts as a guard and reduces the possibility of injury to the trunk from mowers, cars, animals and vandals. Temporary growth often enhances the attractiveness of a young tree, increasing its landscape effect by providing a more massive appearance.

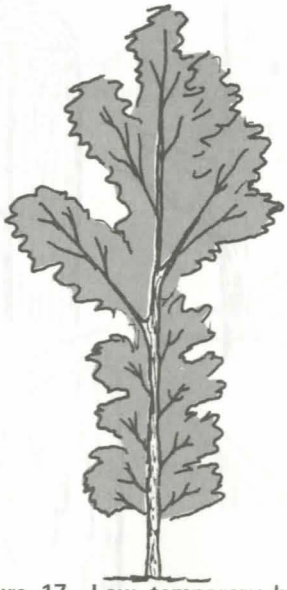

Figure 17. Low temporary branches protect and nourish the trunks of young trees.

Temporary branches will increase total tree growth, even though the tree may not grow quite as rapidly in height as it would with no temporary branches along the trunk. This slight reduction in height growth is a definite advantage in developing a structurally strong tree.

Leaving temporary branches along the trunk and allowing the trunk to flex in the wind not only will increase trunk diameter near the base but will increase trunk taper. This will greatly reduce and sometimes eliminate the length of time a tree must be staked.

Training and Directing the Growth of Young Trees

In many species, directing the growth of young trees is essential if mature trees are to perform properly in the landscape. This discussion will provide information to help you achieve desirable branch placement and structural strength in trees, and may also be useful in training plants to other forms and shapes.

Prune a tree only enough to effectively direct its growth and to

correct any structural weakness. With light pruning, the dwarfing influence will be minimal.

Branches selected for permanent scaffolds should have wide angles of attachment with the trunk and be smaller in diameter than the trunk.

The height of the first permanent branch above the ground will depend on the tree's use in the landscape, as mentioned above. The position of a limb on a trunk remains essentially the same throughout the life of the tree. In fact, as a branch increases in diameter, the distance between it and the ground actually decreases (Fig. 18).

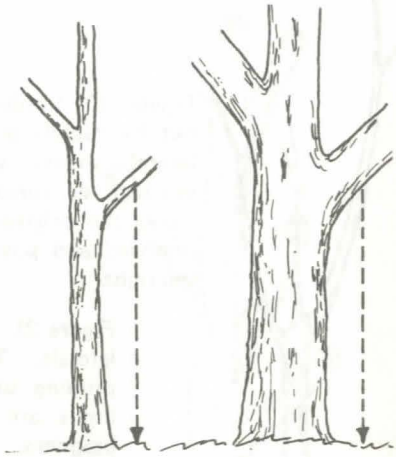

Figure 18. Branches retain their position on the trunk but as they increase in diameter they become slightly closer to the ground.

The height of the lowest permanent branch can be a few inches from the ground to more than 12 feet depending on how the tree is to be used. Even though a certain clearance is needed over a street or a patio, a lower height may be selected if the limb is growing in a direction that will not interfere with traffic or use of the area under the tree (Fig. 19).

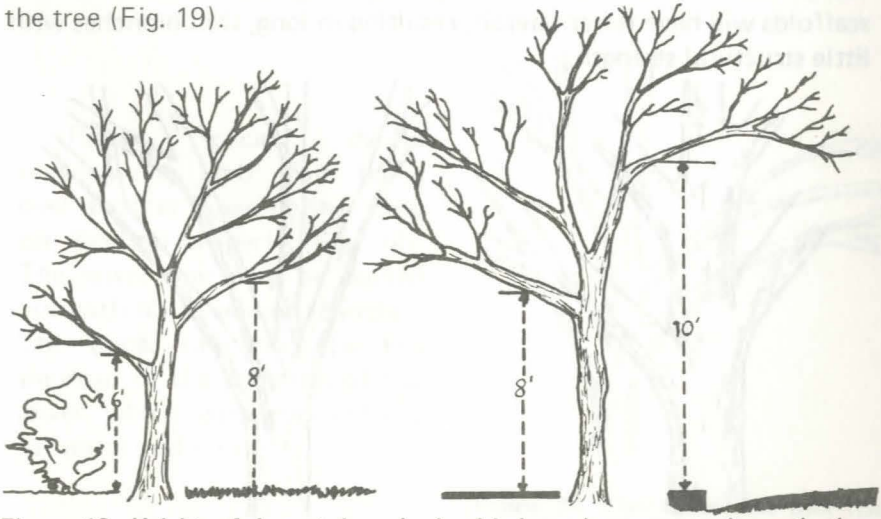

Figure 19. Height of lowest branch should depend on use underneath the branch.

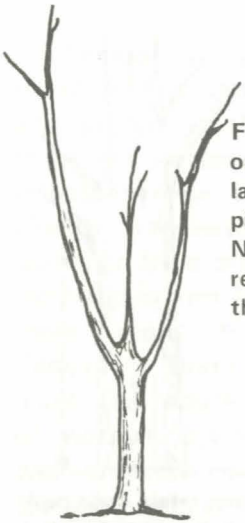

Figure 20. Leader has been choked out by rapidly growing laterals. The lateral shoots should have been pinched or removed much earlier. Now, the original leader should be removed and possibly the lateral on the right.

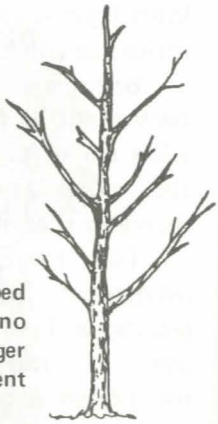

Figure 21. Well-spaced and developed laterals. Tree needs little or no pruning unless some of the larger limbs are too low for permanent branches.

Vertical branch spacing is important in many species for future leader dominance, structural strength and appearance of the tree. Two or more vigorous branches arising at or near the same level on the trunk are apt to "choke" the leader and limbs above (Fig. 20).

Often, on lightly or unpruned trees, the more vigorous branches will be naturally well-spaced while the other branches become relatively weak. Little or no pruning may be needed (Fig. 21).

On mature trees closely spaced scaffolds may break out more easily than those with wider spacing (Fig. 22). Closely spaced scaffolds will have fewer laterals, resulting in long, thin branches with little structural strength.

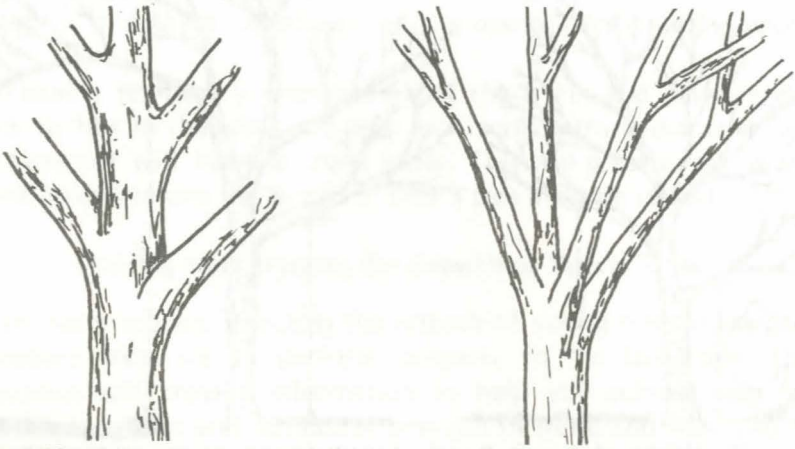

Figure 22. Well-spaced branches (left) are less likely to split out or break than those close together (right).

Vertical spacing should be greater on a tree that will develop into a large tree with large diameter branches than on a tree of smaller mature size.

Major scaffold branches should be spaced at least 8 inches vertically and preferably 18 to 24 inches. Many mature trees have branches 4 to 12 feet apart.

Radial branch distribution should allow five to seven scaffolds to fill the circle of space around the trunk (Fig. 23). This can be done in one or two rotations around the trunk. Although an ascending spiral may appear more symmetrical and pleasing, branches will grow equally well and be as strong even though their origins on the trunk depart from a spiral.

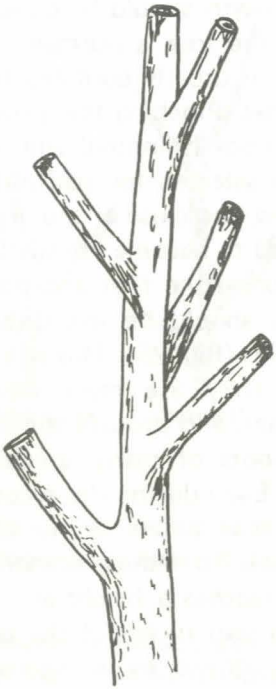

Figure 23. Scaffold branches with good vertical and radial spacing on the trunk.

Radial spacing should prevent one limb from being over another when neither limb can develop properly (Fig. 24). The lower one may be shaded out with no ascending branches. The upper one may be less vigorous in the presence of the lower which competes with it for water and nutrients.

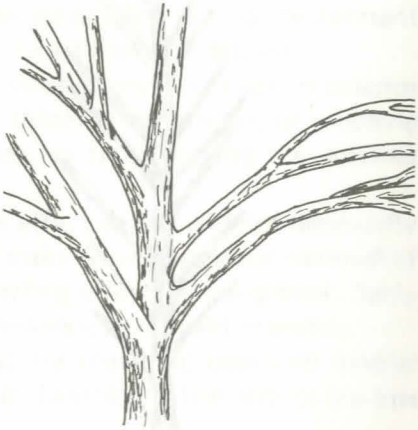

Figure 24. Two limbs, one over the other, interfere with the proper development of the other.

Growth should be directed during the growing season as well as when the tree is dormant. Direction of growth during the growing season is usually confined to manipulation of temporary shoots and branches. Pinching the growing point (heading) or complete removal of a shoot (thinning) will reduce its competition with the leader or shoots selected for scaffold limbs. Pinch or remove shoots that are too low, too close or too vigorous in relation to the leader and shoots selected to become the scaffold branches.

During the first and possibly the second growing season, more shoots should be left unpruned than will finally be selected for scaffolds (Fig. 25). This will allow later selection of the best branches when they are more developed, the elimination of unwanted branches, and provide some insurance against wind and pest damage.

Shoots of many species do not branch the same season they form. Even during the second year, some of these may not develop more than a few or no laterals except near the previous season's terminal. To induce branching, pinch the leader when the growing point reaches a height at which a lateral branch is desired. Remove one to two inches of the tip. Buds below the pinch will grow. One usually grows more vigorously than the other shoots. This will become the leader, although it may need encouragement.

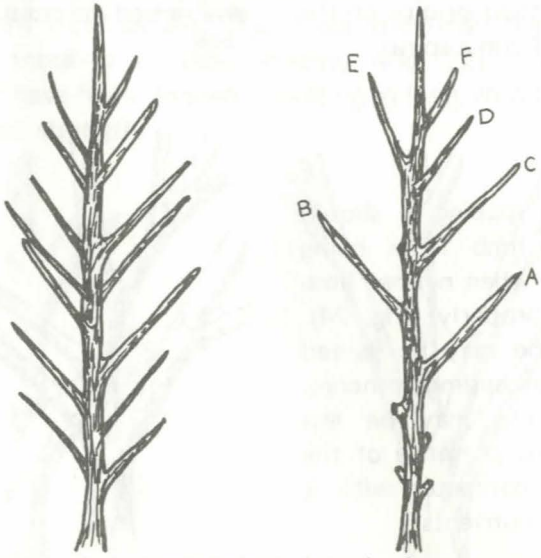

Figure 25. Thinning of the least desirable laterals of a young tree leaving more than eventually needed for scaffolds. Later laterals A, B, C, E or B, D, F, can be selected for permanent branches.

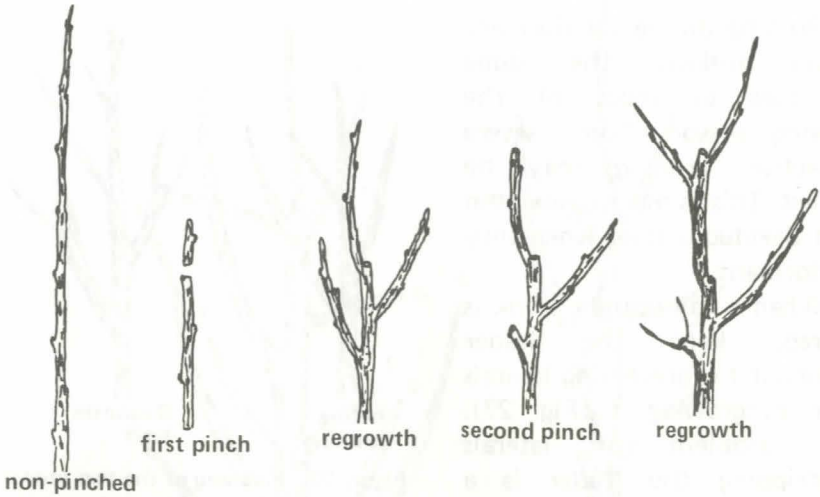

Figure 26. During the growing season, a nonbranching leader can be pinched to induce development of laterals. The two pinches induced branches to occur at the heights desired.

You can select as a lateral a second developing shoot growing in a desired direction by pinching the tips of the other shoots that were forced (Fig. 26). It is better to leave too much space between laterals than to have them too close.

In one season a vigorous tree may permit the forcing of as many as three well-spaced laterals where they are wanted. Without such pinching, the leader would require severe heading during the dormant pruning—to the height at which the lowest lateral is desired.

The development of scaffold branches may be kept in balance with the rest of the tree either by thinning laterals on, or pinching the tips of, the most vigorous ones (or both) during the growing season.

As little as one to two inches is effective and will not drastically reduce total growth. In fact, it will make unnecessary the removal of a large branch later on when the dwarfing effect will be greater. Early pinching directs growth into the permanent leader and branches.

Remove completely shoots that are crowding desirable shoots. This can be done quickly, with little dwarfing, when shoots are less than five inches long.

Pruning during the growing season will reduce the amount of pruning needed during the following dormant period. Growth will be channeled where it will be most effective.

Pruning during the dormant season follows the same principles as those of the growing season. Some severe corrective pruning may be needed. This is more easily seen with deciduous trees when they are dormant.

When a tall upright trunk is desired, keep the leader dominant by preventing laterals from outgrowing it (Fig. 27). The problem of laterals outstripping the leader is a common one with many species, especially those having a diffused form.

Temporary branches on the trunk will strengthen and protect the trunk. At planting time and during later dormant pruning, choose laterals of weak to moderate vigor to be left as temporary branches (Fig. 28). Remove vigorous low-growing laterals if less vigorous ones can be selected. Short, horizontally growing laterals can be left unpruned. More vigorous laterals should be headed back to two- to three-bud spurs during the dormant pruning.

Temporary branches can be spaced 4 to 12 inches apart. Closer spacing may unduly retard height growth. Temporary growth on the southwest side of the trunk also reduces the chance of sunburn injury.

Figure 27. Pinching of the two lowest laterals (left) will keep the upper lateral and leader from being "choked out" (right).

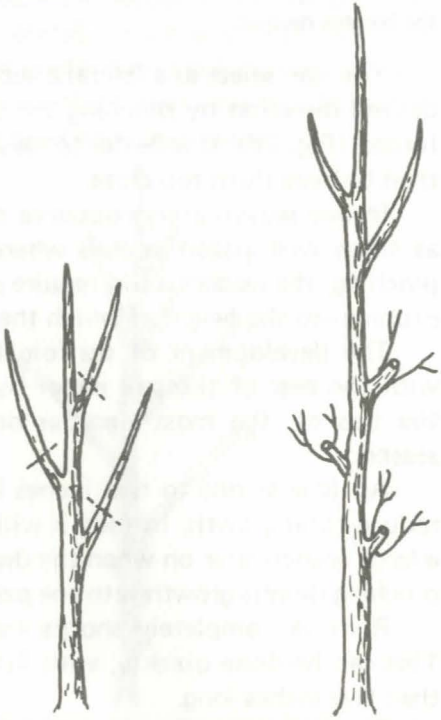

Figure 28. Keep the leader dominant by pinching back lower competing branches.

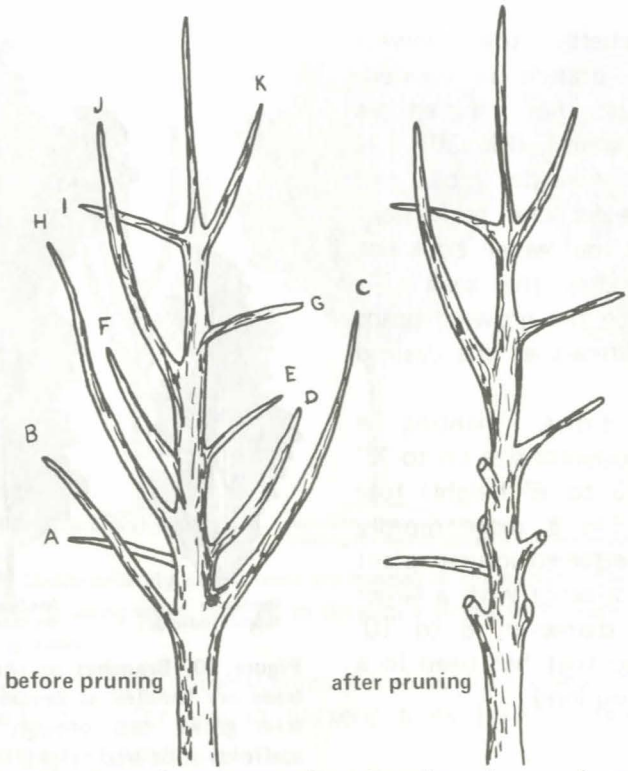

Figure 29. Selection of temporary branches: low vigorous branches (C, H) thinned out; low limbs of moderate vigor (B, D, F) headed to 2 to 3 buds; low weak twigs (A, E, G, I) left unpruned; branches (J, K) suitable for scaffolds left unpruned.

During the growing season, pinching the tips of vigorously growing temporary branches may be necessary to keep them in bounds and to reduce competition with the leader and permanent branches. Most trees should be visited at least two to four times. The first visit is best timed when new growth is four to six inches long. This requires little time per tree and provides an opportunity to check on any other problems that may be developing.

As a young tree develops a sturdy trunk and a top that effectively shades the trunk, the temporary branches can be reduced in number and eventually eliminated. This can be done over a two- to three-year period. Remove the largest ones at each pruning to minimize the size of the pruning wound (Fig. 29).

A tree may not be tall enough when planted for the selection of any permanent lateral branches. If laterals are present or are growing

below where the lowest permanent branch is wanted, they should be handled as temporary laterals (Fig. 30).

When the leader grows tall enough, select the permanent laterals. If the leader does not form branches the season it grows, pinch the growing point to force laterals at the desired heights.

Many times, planting a healthy, moderate-size (½ to ¾" diameter, 5 to 6' height) tree will result in a more rapidly growing, better structured plant than is obtainable with a larger (1 to 2" diameter, 8 to 10' height) tree that has been in a container too long.

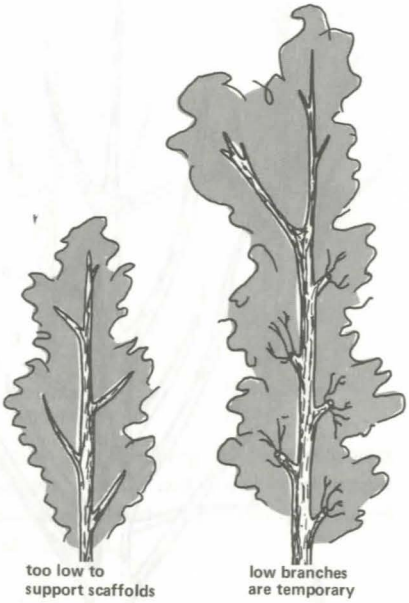

Figure 30. Branches on short young trees are handled as temporary until tree grows tall enough to have scaffolds at desired height.

Handling Special Pruning Problems

Nursery trees with low laterals of large size are a problem. Don't choose such trees if others are available.

Many trees for landscape use are headed in the nursery when they become four to five feet tall (Fig. 31). This forces laterals below the cut. These branches form a compact head giving the tree good proportions when small but with no leader. In many cases, these branches are too low and too close together.

At planting, select the most upright and vigorous branch to become the leader. Choose a second branch as the first scaffold if it is high enough above the ground. In some cases, only a leader can be selected. Thin other branches and treat those remaining as temporary.

The sooner corrective pruning is done, the less dwarfing influence pruning will have. However, in some cases the pruning must be so severe that it should be done over at least a two-year period. This is

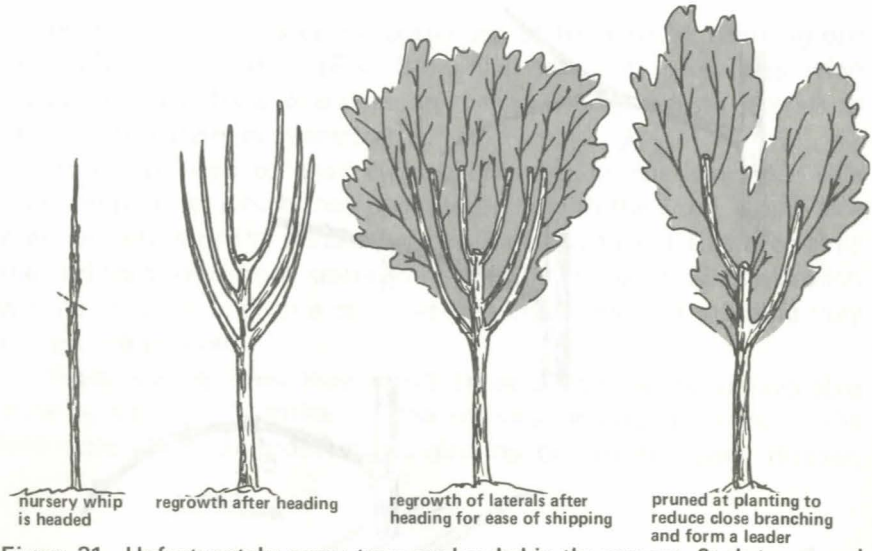

Figure 31. Unfortunately many trees are headed in the nursery. Such trees need rather severe pruning when planted to develop a strong framework high enough above the ground.

more true for older nursery trees (three to four years in five-gallon containers) than for young nursery trees (one to two years in five-gallon containers).

An upright branch will usually be more vigorous than one that is less vigorous and may be used as permanent branch if its position is desirable. However, it may compete with the leader. If a more horizontal branch can be selected, it is usually wise to remove the more upright one. As many species with a diffuse branching habit mature, the leader becomes less dominant.

Occasionally, branches will grow vigorously upright on trees that normally have subdued horizontal limbs. Remove these or cut to an outward growing lateral as soon as they are spotted (Fig. 32). Otherwise, they will upset the symmetry of the tree.

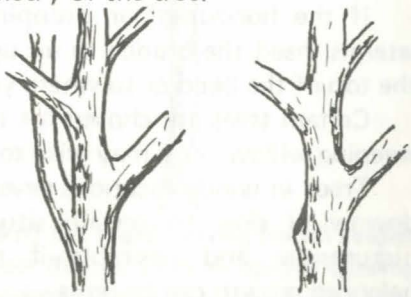

Figure 32. A vigorous, upright branch (left) may compete with the leader or deform the tree, it should be thinned out (right) as soon as recognized.

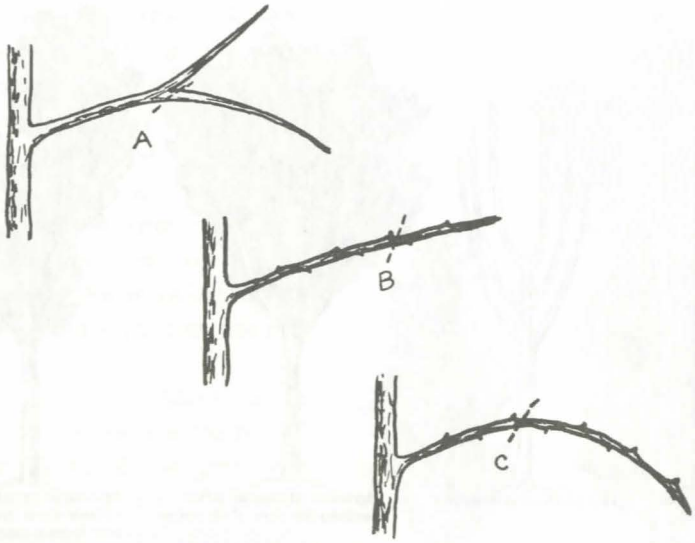

Figure 33. Prune back horizontal limbs (A) to a more upright lateral, (B) to an upward growing bud near the tip of a flat limb or (C) at the top of the bend.

In contrast to upright branches, those growing more horizontally are usually of low vigor. Horizontal branches will seldom compete with the leader. These branches or twigs are desirable as temporary branches to protect and nourish the trunk. Unless they become too long, the smaller ones can be left unpruned.

Horizontal or drooping limbs may, however, be a problem in some young trees (Fig. 33). If they droop because of excessively vigorous growth, buds back from the top of the bend will often grow. The new shoots will usually be more upright. You can select well-placed shoots from these by thinning the lateral back to the selected shoot. Thin out other new shoots that might compete or interfere with the one selected.

If the horizontal or drooping limb has no well-placed upright laterals, head the branch to an upward-pointing bud slightly back of the top of the bend or to where you want a lateral.

Certain trees are chosen for their drooping branching habit, e.g., weeping willow. You may wish to exploit this characteristic.

Trees in windy locations develop laterals more extensively on the downwind side. In certain situations, such a condition may be picturesque and desirable—if not, remedial pruning for more balanced growth can be done.

In windy locations open up the top of the tree by thinning out moderate-size branches (Fig. 34). The tree will offer less wind resistance. Thin back branches on the downwind side to laterals to keep the tree more symmetrical.

You may need to head curving branches on the windward side near the point at which they begin to bend with the wind. Prune to a bud pointing into the wind. You may need to repeat this each time the endmost new shoot starts to be bent by the wind. Such a branch will be stockier and able to resist bending. One such pruning may correct the problem.

Weak young trees may result from a number of unfavorable growing conditions, either in the nursery or after planting in the landscape. If such problems as girdling or kinked roots, disease,

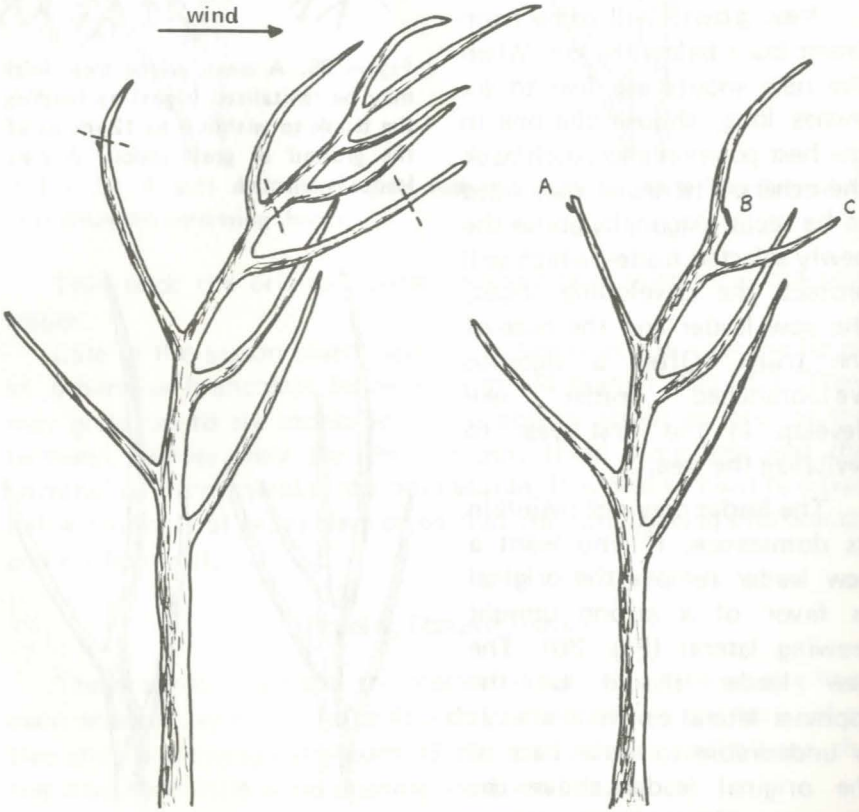

Figure 34. Tree deformed by the wind (left) has (right) curving branch headed to bud (A) pointing into the wind; leader thinned to more upright growing lateral (B); and a downwind branch (C) headed to form a more symmetrical tree.

insects, trunk sunburn, poorly drained soil, etc., are not limiting growth, severe pruning may be the last resort that will revitalize the tree (Fig. 35). Because of the lack of latent buds, however, most conifers will not respond to such pruning.

Head the trunk 6 to 12 inches above the ground or graft union. Paint the trunk white to prevent sun damage.

New growth will come from latent buds below the cut. When the new shoots are five to six inches long, choose the one in the best position and pinch back the others. The trunk may need to be recut diagonally above the newly selected leader, which will protect the developing shoot, the new leader and the base of the trunk. Often a vigorous well-branched leader will develop in the first year to revitalize the tree.

The leader may not maintain its dominance. If you want a new leader remove the original in favor of a strong upright growing lateral (Fig. 36). The new leader should be the topmost lateral on the trunk. It is undesirable to leave part of the original leader above the new one because it creates unnecessary competition between the two.

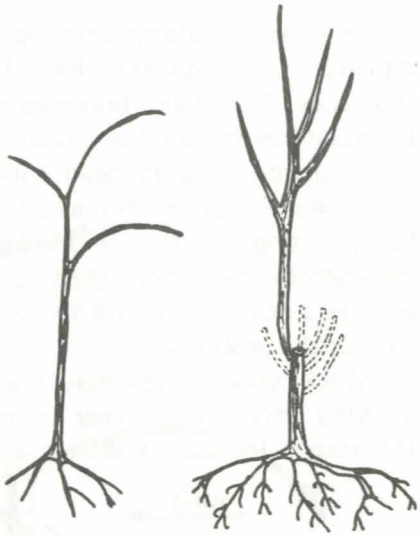

Figure 35. A weak young tree (left) may be revitalized (right) by heading the trunk to within 6 to 12 inches of the ground or graft union. A new leader is selected.

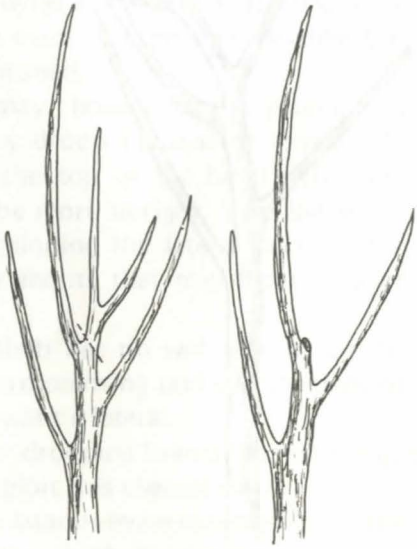

Figure 36. When a leader has lost its dominance (left) select a new one (right) by thinning out the original.

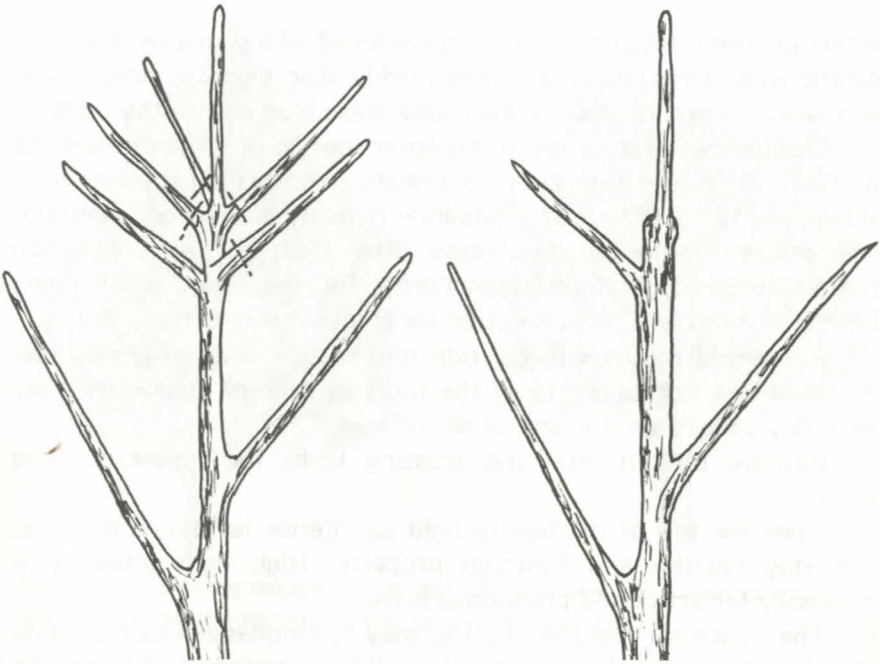

Figure 37. A tuft of short laterals near the terminal (left) are thinned to encourage the remaining shoots.

Thin back the original leader to the lateral selected as the new leader.

Late in the season several buds may begin growth near the tip of an otherwise branchless leader or scaffold branch (Fig. 37). They may grow up to six inches in length and be about as large as the terminal. Unless they are thinned out, these branchlets and the terminal will grow weakly the next season. It is best to head to a bud below this tuft of branchlets or to thin the tuft, leaving one branch and the terminal.

Pruning Mature Trees

The scaffold limbs and the main structure of a tree usually have been selected by the third or fourth year depending on the kind of tree and its growing conditions. If the scaffolds are well placed, the tree may need little or no pruning for several years.

Mature trees may need to be pruned for several reasons.

Tree health and appearance can be improved by removing limbs that are dead, weak, diseased and insect-infested. Sources of future

infection and infestation also can be reduced. Many species of insects attack weak trees and limbs more readily than vigorous ones. Some diseases, too, are more serious on weak trees than on healthy ones.

Pruning can remove new or holdover sources of some diseases. Be careful to make the cuts in healthy wood well below the infection—12 to 18 inches if possible. If many trees need attention, the shears should be disinfected after each cut with common household bleach, sodium hypochlorite. Dip the shears in a one part bleach to nine parts water solution for a couple of seconds.

Household bleach will corrode tool metals with prolonged use. To minimize corrosion, rinse the tools in running tap water after each day's use, then dry and oil all surfaces.

Remove broken, low and crossing limbs for appearance and safety.

Open the top of the tree to light so interior leaves and branches can stay healthy and function properly. High light intensity is necessary for active and productive leaves.

The structural features of a tree may be emphasized by moderate thinning to open the tree to view. "Just another tree" may be transformed into a picturesque feature in the landscape.

To open up a medium to large-size tree (40 to 60 ft.), moderate-size thinning cuts of limbs one to two inches in diameter are effective. Somewhat smaller cuts for smaller size trees are appropriate. These should be made in the top and around the sides of the tree. Remove branches that are close to others. In some large trees, cuts may remove limbs up to six inches in diameter. However, such large cuts indicate the tree has not been properly pruned or that its use in the landscape has changed.

Size control is commonly attempted by pruning. You can most effectively control size by pruning as the tree begins to reach the desired height. Delay of pruning until the tree is much larger than wanted makes pruning more difficult, makes cuts harder to hide and encourages excessive regrowth.

Thinning-out pruning can be used to reduce the height and spread of a tree (Fig. 38). Cut branches to lower laterals (drop crotching). Some limbs may be removed completely. A thinned tree retains its natural shape and is less subject to vigorous water sprouts than a headed tree.

Heading or stubbing is the most common way to reduce tree size. While more rapid than thinning, the results are very undesirable.

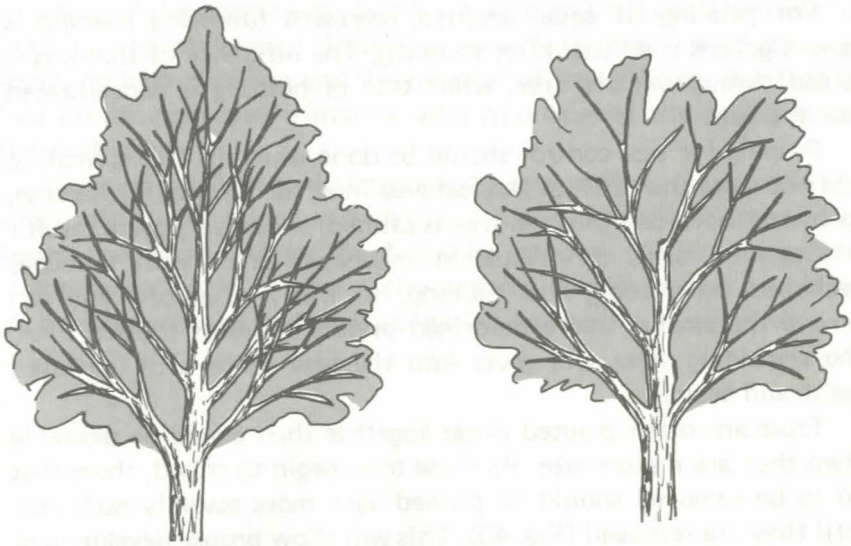

Figure 38. Thinning reduces the height of and opens up a mature tree (left) retaining the natural appearance and form of the tree (right).

Regrowth is vigorous and upright from the stubs. The new branches form a compact head, cast dense shade and are weakly attached to the older ones (Fig. 39).

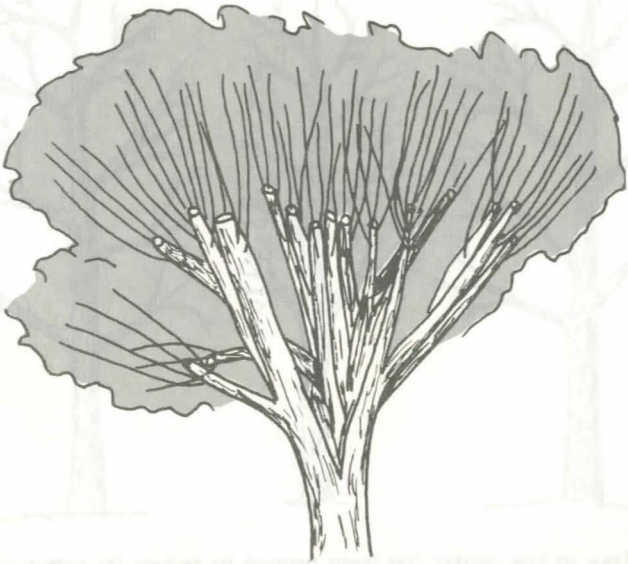

Figure 39. A headed tree will force many vigorous upright shoots. The tree loses its natural form.

For pruning of equal severity, regrowth following heading is more vigorous than that after thinning. The influence of thinning is spread throughout the tree, while that of heading is concentrated near the cuts.

Pruning for size control should be done while the tree is small so that not more than 25% of the leaf area must be removed. Otherwise, no matter how carefully the tree is pruned, excessive growth results.

Crowded trees can result in misshaped trees with branches weakened by shading and rubbing. In many situations you can remove the smaller, more deformed or less desirably located trees. The remaining trees will grow into the new space with improved health and beauty.

Trees are often planted closer together than would be desirable when they are mature size. As these trees begin to crowd, those that are to be removed should be pruned back more severely each year until they are removed (Fig. 40). This will allow proper development of the permanent trees while still retaining the value of the temporary trees.

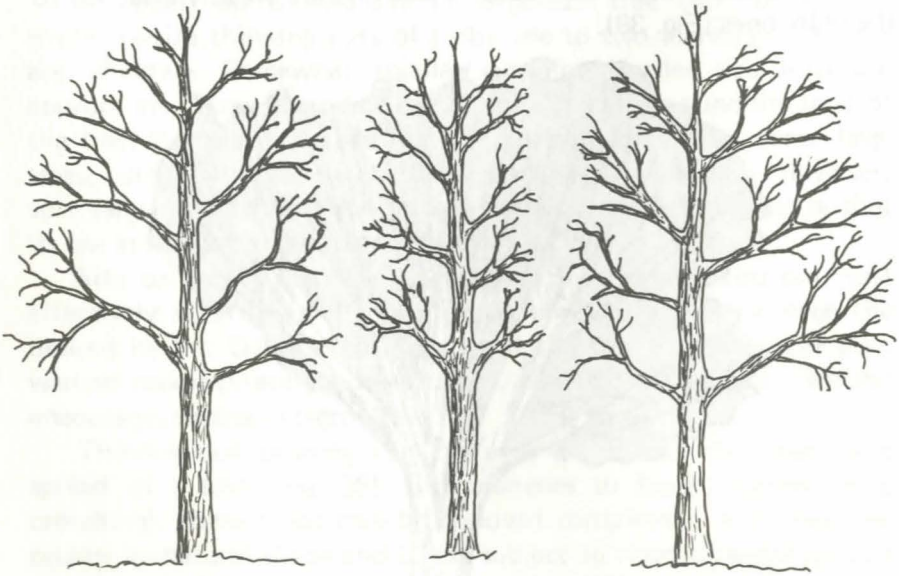

Figure 40. Tree in the center has been pruned to reduce its competition with the others. It can be removed with little loss.

Most of the pruning and tree training operations described can be done by homeowners. However, when large trees need pruning involving high climbing and the removal of heavy limbs, it is best to hire professional tree trimmers, who have special equipment to do the work safely.

In hiring a person to do tree maintenance work, it is important to check his qualifications and ability to do good work. Some of the larger towns and cities of Nebraska require people doing tree maintenance work to have a city arborist license. Anyone holding such a license has passed an examination and would be qualified.