

Pruning Objectives

No tree should be pruned without first establishing clearly defined objectives. Seven main objectives are described (Table 1), along with pruning types that help meet those objectives. These objectives serve as examples and can be expanded or shortened to meet site conditions and customer expectations. Removing the correct stems and branches to accomplish specified objectives is as important as making correct pruning cuts. Even with proper pruning cuts, if the wrong branches—or too many branches—are removed, nothing of merit has been accomplished.

Table 1. Objectives of pruning.

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- Reduce risk of failure
 - Provide clearance
 - Reduce shade and wind resistance
 - Maintain health
 - Influence flower or fruit production
 - Improve a view
 - Improve aesthetics
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Reduce Risk of Failure

Risk of tree failure can be reduced by establishing a structural pruning program that begins at planting and could carry through the first 25 years or more, depending on the species. This program should be designed to create structurally sound trunk and branch architecture that will sustain the tree for a long period. Some structural pruning can be conducted on older trees as well. Medium-aged and mature trees can be cleaned, thinned, reduced, raised, or restored to manage risk. The choice among these pruning methods depends on the tree and the situation.

Provide Clearance

Growth can be directed away from an object such as a building, security light, or power line by reducing or removing limbs on that side of the tree. However, trees often grow back to fill the void created by pruning. Regular pruning is required to maintain artificial clearance. Shortening or removing low branches can raise the crown. Crown reduction or pollarding helps maintain a tree smaller than it would be without pruning. Utility pruning keeps limbs clear of overhead wires and other utility structures.

Reduce Shade and Wind Resistance

Lawns, ground covers, or shrubs can receive more sunlight when live foliage is removed from the crowns of large overstory trees. The tree's resistance to wind also can be reduced with pruning. Structural pruning, thinning, reduction, and pollarding are used to accomplish this objective.

Maintain Health

Health can be maintained by cleaning the crown, especially in medium-aged and mature trees. Removing dead, diseased, and rubbing branches in the crowns of young trees also is important.

Influence Flower or Fruit Production

Pruning can influence the number and/or size of flowers or fruit. Fruit size can be increased on certain plants, such as peach, by removing some of the developing fruit or flowers. Flower cluster size can be increased on certain species, such as crapemyrtle, by heading. Fruit production can be eliminated by removing flowers or developing fruit.

Improve a View

A view can be enhanced or created by removing live branches at the edge of the crown, at the top of the tree, or on the lower side of the crown. This pruning can include thinning, reducing, pollarding, and raising.

Improve Aesthetics

A tree can be pruned to improve appearance. Cleaning, reducing, thinning, pollarding, and restoring can be used to meet this objective.

Pruning Methods (Types)

Several pruning methods (types) are used in arboriculture to achieve the tree owner's or manager's objective. The four primary pruning methods include cleaning, thinning, raising, and reducing. Trees are also pruned to improve structure and for crown restoration. When writing job specifications the diameter range and location of the branches and stems to be removed should always be included.

Pruning to Clean

Cleaning is the selective removal of dead, diseased, detached, cracked, and broken branches. This type of pruning is done to reduce the risk of branches falling from the tree and to reduce the movement of decay, insects, and diseases from dead or dying branches into the rest of the tree. It can be performed on trees of any age but is most common on medium-aged and mature trees. Cleaning is the preferred pruning type for mature trees because it does not remove live branches unnecessarily.

The location of branches to be removed should be specified if the entire crown is not going to be cleaned. The diameter of branches to be removed also should be specified. This usually is done by specifying the smallest branch to remove (for example, "clean branches 1 inch [2.5 cm] in diameter and larger").

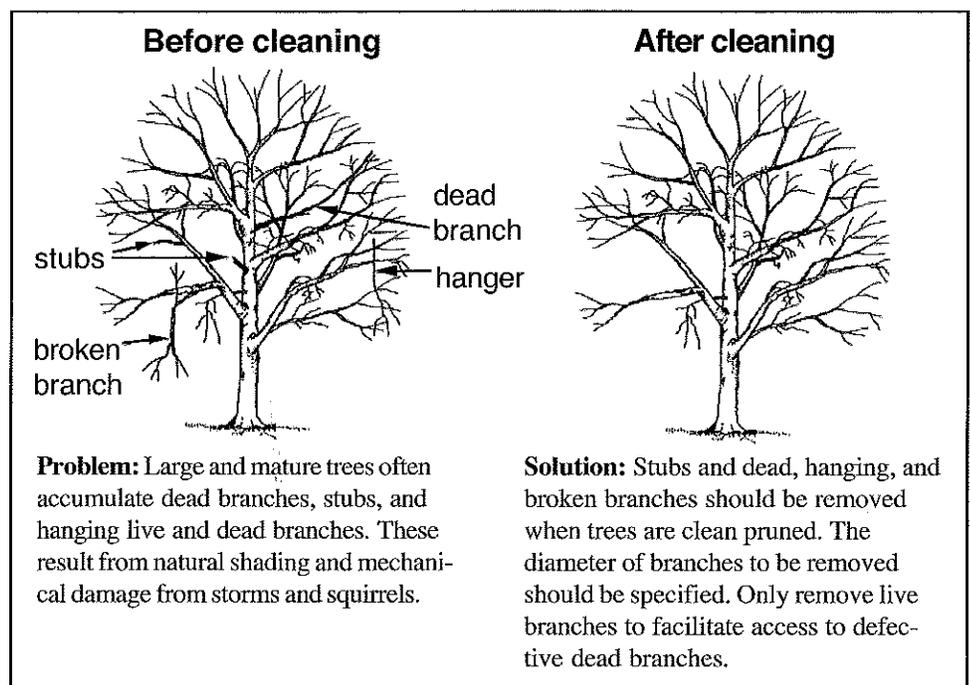


Figure 2. Pruning to clean

Pruning to Thin

Thinning is the selective removal of small live branches to reduce crown density (Figure 3). Because the majority of small branches are at the outside edge of the crown, thinning is focused in that area. Proper thinning retains crown shape and size and should provide an even distribution of foliage throughout the crown.

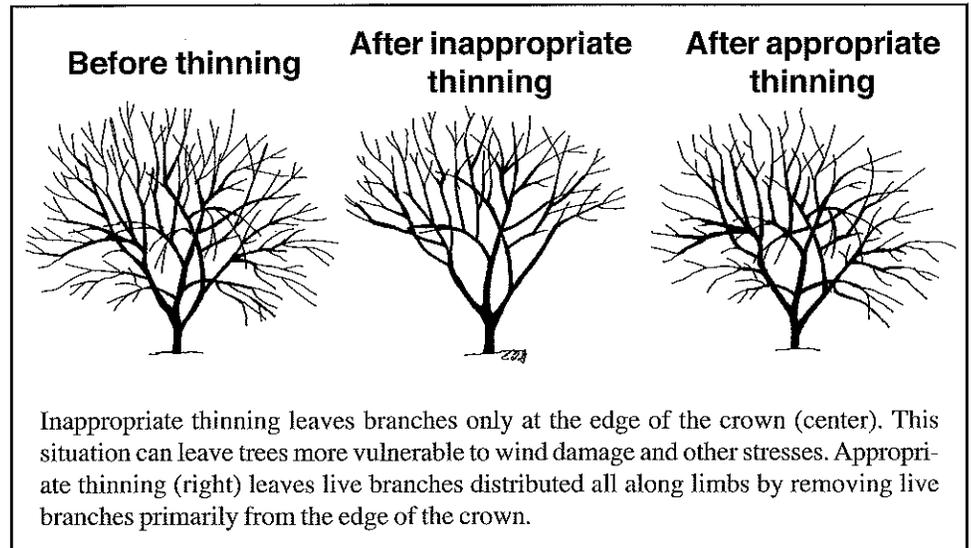


Figure 3. Thinning trees reduces density at the edge of the crown, not on the interior.

Thinning increases sunlight penetration and air movement through the crown. Increased light and air stimulate and maintain interior foliage, which can encourage taper on scaffold branches. Thinning a limb should be considered if cabling will be performed. Thinning also can remove suckers from the base of the tree and *some* watersprouts on the interior. Excessive removal of watersprouts often produces more watersprouts, so it is not recommended. Vigorous production of watersprouts on interior limbs often is a sign of overthinning, topping, or lion tailing.

Excessive branch removal on the lower two-thirds of a branch or stem (lion tailing) can have adverse effects on the tree and therefore is not an acceptable pruning practice (Figure 3). Lion tailing concentrates foliage at the ends of branches and may result in sunburned bark tissue, watersprouts, cracks in branches, reduced branch taper, increased load on branch unions, and weakened branch structure. Lion tailing also changes the dynamics of the limb and often results in excessive branch breakage.

If the entire crown will not be thinned, the areas to be thinned must be specified. The size range and percentage of foliage to be removed also must be specified—usually in the 10 to 15 percent range—but should not exceed 25 percent of the

foliage, especially on mature trees. Most thinning removes branches 1/2 inch (1.5 cm, small trees) to 2.5 inches (6.5 cm, mature trees) in diameter. If larger branches are removed, large gaps may be created in the crown, or watersprouts can result.

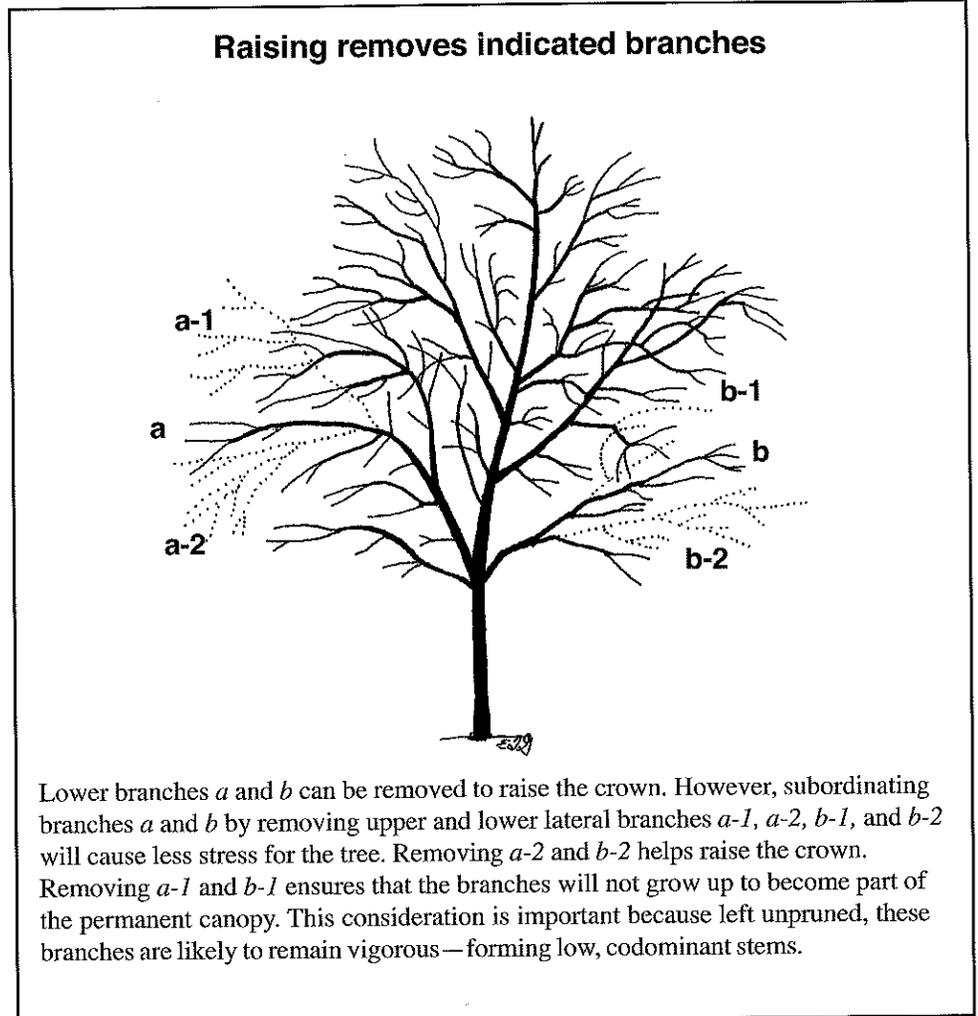


Figure 4. Raising

Pruning to Raise (Elevate, Lift)

Raising is the selective removal of branches to provide vertical clearance. Crown raising shortens or removes lower branches of a tree to provide clearance for buildings, signs, vehicles, pedestrians, and vistas.

Excessive removal of lower limbs can slow development of trunk taper, can cause cracks or decay in the trunk, and concentrates foliage at the top of the tree.

Mature trees could become stressed if large-diameter lower branches are removed. Clearance sometimes can be achieved by shortening some of the low branches rather than removing them to prevent these problems. Live crown ratio should be no less than 50 percent when raising is completed (Figure 4), and more is better. Structural pruning should be considered along with raising.

When raising, the desired clearance should be specified. To differentiate between complete branch removal and shortening, specify the size range of the limbs to remove and their location (for example, "raise 12 feet [3.5 m] above the road by removing downward-growing branches 2 inches [5 cm] in diameter and smaller").

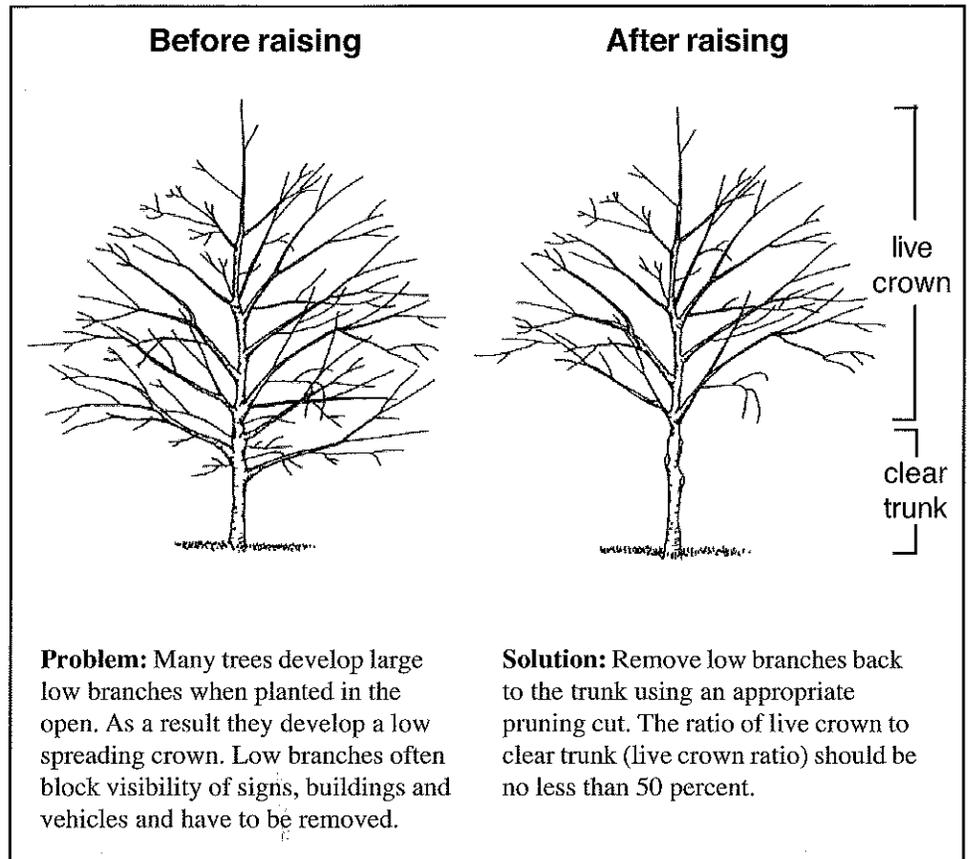


Figure 5. Raising the crown by removing low branches.

Pruning to Reduce (Shape, Drop Crotch)

Reduction is the selective removal of branches and stems to decrease the height and/or spread of a tree or shrub (Figure 6). This type of pruning is done to minimize risk of failure, to reduce height or spread, for utility line clearance, to clear vegetation from buildings or other structures, or to improve the appearance of the plant. Portions of the crown, such as individual limbs, can be reduced to balance the canopy, provide clearance, or reduce likelihood of breakage on limbs with defects. Occasionally, the entire crown is reduced. Reducing or thinning should be considered if cabling would be performed. Crown reduction should be accomplished with reduction cuts, not heading cuts.

Not all tree and shrub species can be reduced. Therefore, the species and plant health should be considered before starting work. Old, stressed, or mature trees could decline or become more stressed as a result of this treatment. When a limb on a

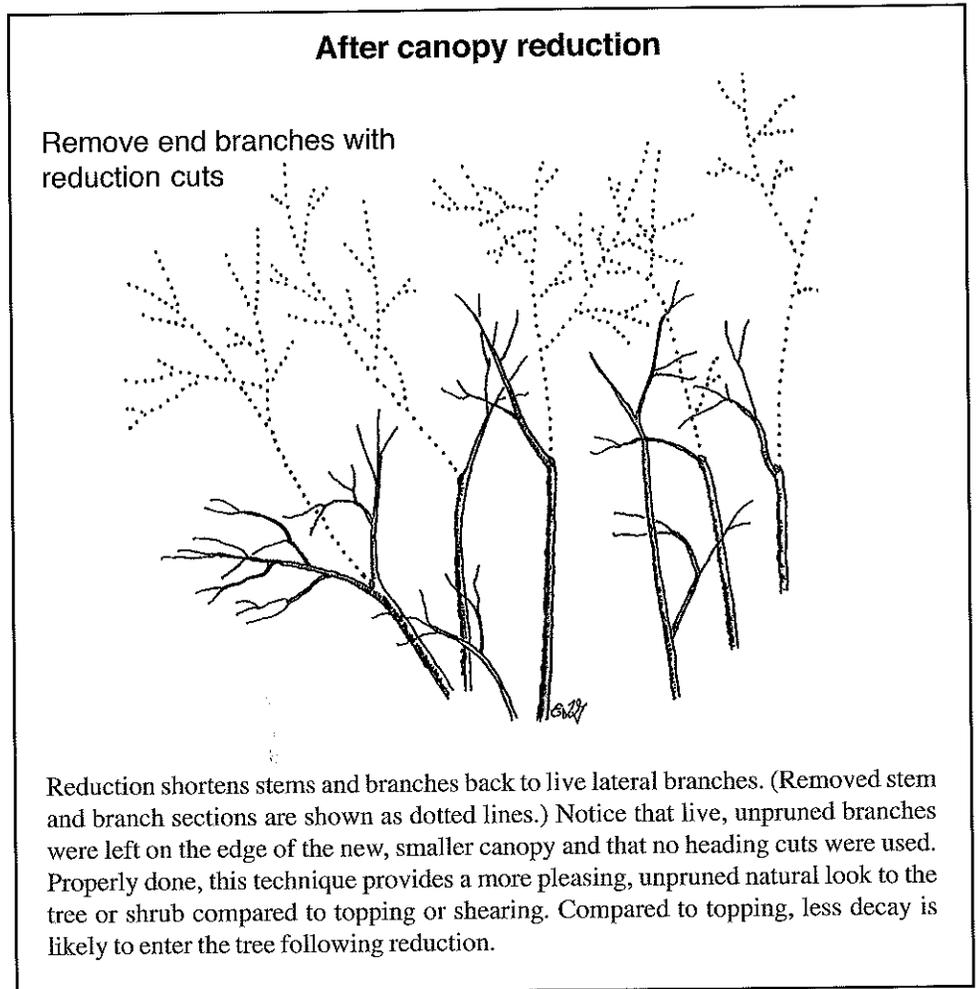


Figure 6. Reduction makes a plant, or portion of a plant, smaller in size.

mature tree is cut back to a lateral, no more than one-fourth of its foliage should be removed in routine tree care. More can be removed when pruning to reduce risk, or on a young tree to accomplish particular objectives. Decay is more likely to enter the tree following reduction than following other pruning types.

The clearance distance or percentage of size reduction should be specified. Because making many small cuts or just a few larger-diameter cuts can reduce a tree, it is important also to specify the size range of cuts. Reduction usually should be done on smaller-diameter branches (for example, 1 to 4 inches [2.5 to 10 cm] for trees and 1/4 to 1 inch [0.5 to 2.5 cm] for shrubs).

Structural Pruning

Structural pruning is the removal of live branches and stems to influence the orientation, spacing, growth rate, strength of attachment, and ultimate size of branches and stems. Structural pruning is used on young and medium-aged trees to help engineer a sustainable trunk and branch arrangement. If young trees are pruned to promote good structure, they likely will remain serviceable in the landscape for more years than trees that have not been structurally pruned. Waiting until the tree grows larger makes structural pruning difficult and is more damaging to the tree.

Structural pruning of large-maturing trees such as maples, eucalyptus, and oaks reduces certain defects and spaces main branches along one dominant trunk. Subordination can reduce branches, so they remain smaller than about half the trunk diameter, which helps prevent structural failure later. This pruning type can be summed up in the phrase: subordinate or remove codominant stems. Small-maturing trees can be trained to several trunks or pruned to develop only one, depending on the situation. Small-maturing trees and shrubs are structurally pruned to properly space codominant stems, reduce or remove rubbing limbs, and provide desirable crown configuration. The maximum diameter of the reduction cuts used with this pruning type should be specified.

Multiple prunings over time (for example, 15 to 25 years) usually are required to develop a dominant leader (Table 2). Competing stems and branches are subordinated (reduced in length) or removed (Figure 7). Subordination usually is preferred over removal, especially if the problem stem or stems are larger than half the trunk diameter. Subordination may cause less trunk decay than removal. The offending

Table 2. To establish a dominant leader on a young or medium-aged tree, follow these four steps to encourage a leader to dominate the crown.

1. Choose the one stem that will make the best leader.
2. Identify which stems and branches are competing with this leader.
3. Decide how much to shorten these competing stems.
4. Prevent branches from growing larger than half the trunk diameter by regular pruning.

stem(s) can always be removed later, if necessary. Cleaning and raising are usually done in conjunction with structural pruning.

The lowest permanent limb should be established by shortening vigorous branches below it and any lower branches that grow up into the crown (Figure 7). This procedure may not be possible on a young tree if all branches are below the best position for the lowest permanent limb. The height of the lowest limb is determined by the location and intended function of the tree. For example, the lowest permanent limb on a street tree might be higher than that on an arboretum specimen.

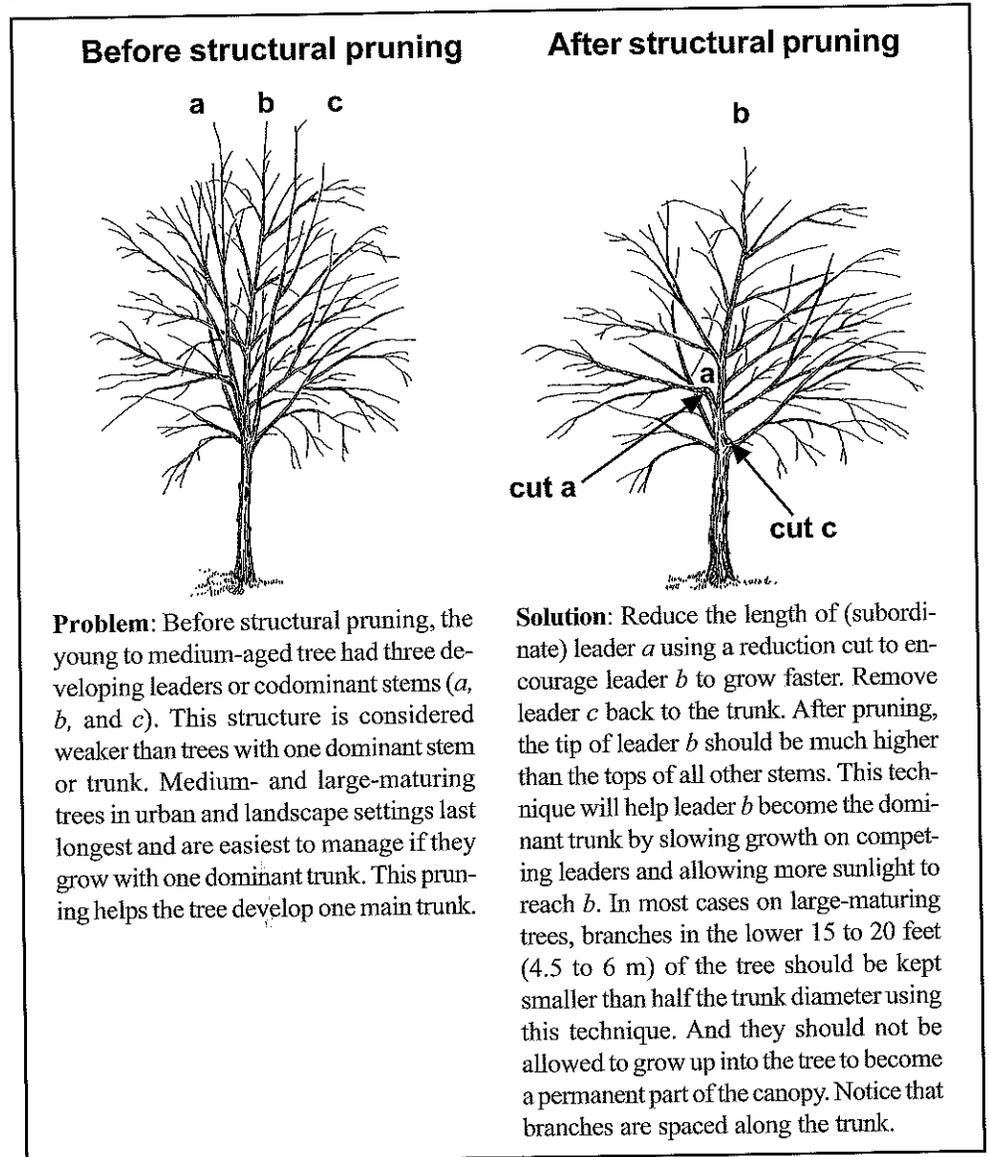


Figure 7. Structural pruning of a small tree.

Select and establish scaffold limbs by subordinating or removing competing stems or branches (Figure 8). Scaffold selection can take 10 to 20 years or more depending on climate, the type of tree, and its location. Scaffold limbs are located above the lowest permanent limb and provide the base on which to build the permanent crown. Scaffold limbs should be free of serious defects such as crooks, included bark, and cracks; should be among the largest on the tree; and should be appropriately spaced. Vertical spacing should be at least 18 inches (46 cm) for large-maturing trees and about 12 inches (30 cm) for smaller trees.

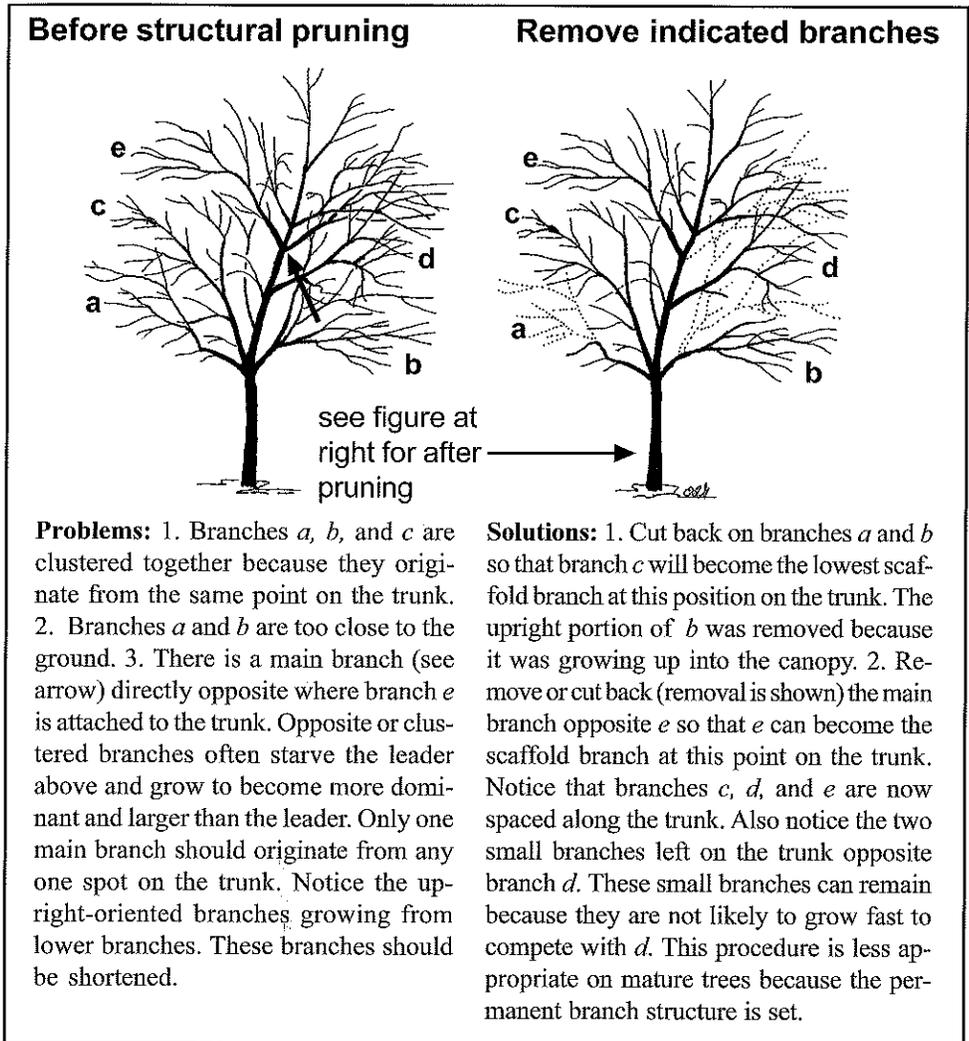


Figure 8. Structural pruning is done to ensure more sustainable growth patterns.

Pruning to Restore

Restoration (remedial pruning) is the selective removal of branches, sprouts, and stubs from trees and shrubs that have been topped, severely headed, vandalized, lion tailed, broken in a storm, or otherwise damaged (Figure 9). The goal of restoration is to improve a tree or shrub's structure, form, or appearance.

On trees with many sprouts originating at the ends of branch stubs, one to three sprouts are selected to become permanent branches and to reform a more natural-appearing crown. To accomplish this objective, consider shortening some sprouts, removing others, and leaving some untouched. Some vigorous sprouts that will remain as branches may need to be shortened to control growth and ensure adequate attachment for the size of the sprout.

Lion-tailed trees can be restored by allowing sprouts to develop along the interior portion of limbs for one to three years depending on size, age, and condition of the tree. Then remove and shorten some of the sprouts along the entire length of the limbs, so they are evenly distributed and spaced apart. Restoration usually requires several prunings over a number of years.

Restoration may require a variety of types of cuts. At times, heading cuts may be preferable to branch removal cuts or reduction cuts to preserve as much of a damaged branch as practical. This is sometimes the case in restoration after storm damage.

Specify the location in the tree (for example, top or interior) and the percentage of sprouts to be removed or reduced. Typically, one-third of the sprouts are removed and one-third are reduced each pruning until adequate branches have developed.

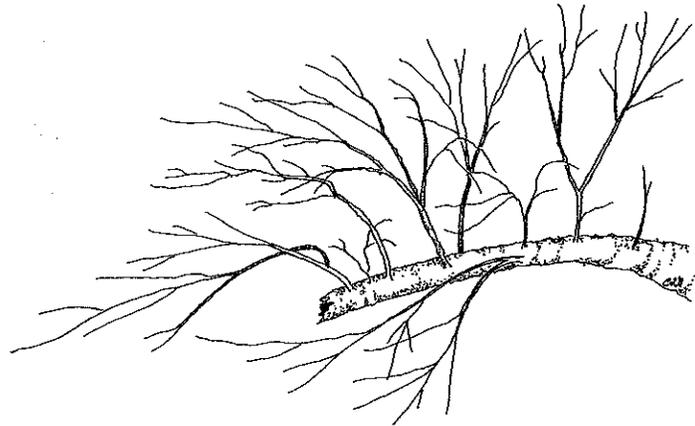
Pollarding

Pollarding is a training system that involves heading the first year followed by annual sprout removal to maintain trees or shrubs at a predetermined size or to maintain a "formal" appearance. Pollarding is not topping. Pollarding historically was used to generate shoots for fuel, shelter, and various products because of the abundance of adventitious sprouts that a tree or shrub produces in this process. The pollarding process should be started on deciduous trees when the tree is young by making heading cuts through stems and branches no more than about three years old.

Table 3. Some species in these genera are known to tolerate pollarding.

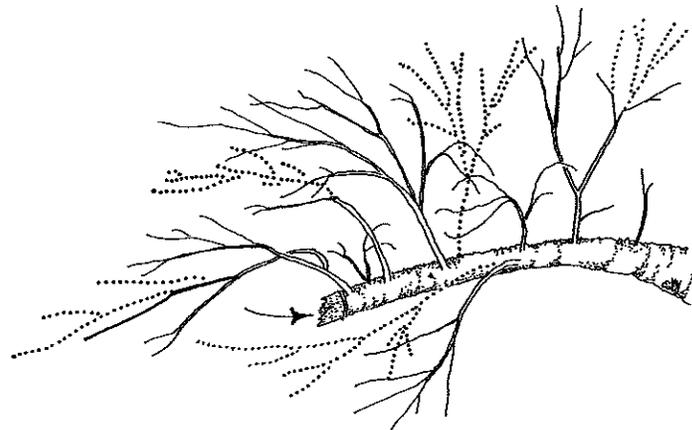
Ash (<i>Fraxinus</i>)
Beech (<i>Fagus</i>)
Catalpa (<i>Catalpa</i>)
Crapemyrtle (<i>Lagerstroemia</i>)
Elm (<i>Ulmus</i>)
Hawthorn (<i>Crataegus</i>)
Horsechestnut (<i>Aesculus</i>)
Japanese quince (<i>Chaenomeles</i>)
Linden (<i>Tilia</i>)
Maple (<i>Acer</i>)
Oak (<i>Quercus</i>)
Pear (<i>Pyrus</i>)
Plane tree (<i>Platanus</i>)
Sweetgum (<i>Liquidambar</i>)

Before restoration



Problem: Many sprouts form from the cut ends of topped or storm-damaged trees. Some sprouts also develop behind the cuts. All are poorly attached to the tree—at least for several years—and can break easily. Notice the eight sprouts that developed from the damaged branch. There are too many sprouts too close together.

After restoration



Solution: Begin by removing dead stubs (see arrow), removing some sprouts completely, and shortening others using reduction cuts (indicated by dotted lines). This procedure helps rebuild structure by spacing unpruned sprouts apart so that they can develop into branches. The shortened branches help protect the sprouts that remain.

Figure 9. Restoration attempts to improve structure by removing or reducing sprouts.

Severe heading (topping) through older tissue may kill or start a decline syndrome on some tree species. Table 3 lists several trees that can tolerate pollarding.

Heading cuts are made at strategic locations so that the sprouts from all cuts have access to sunlight. After the initial cuts are made, no additional heading cuts should be necessary. After a few pruning cycles, pollard heads (also called knuckles or knobs) develop, and the tree produces sprouts from these knuckles. Sprouts that grow from knuckles should be removed during the dormant season, taking care not to cut into or below the knobs. The knobs are the key differentiating factor between pollarding and topping. If knobs are damaged or removed in subsequent pruning, the branches react as they would on a topped tree.

Pruning Palms

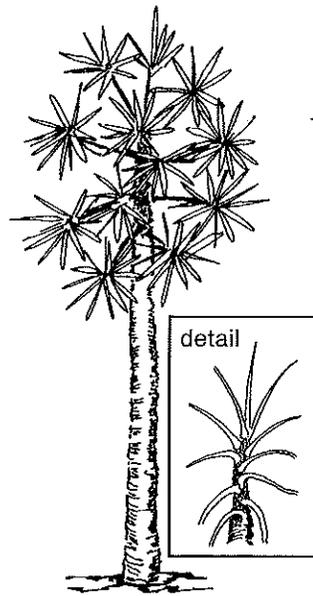
Palm pruning is the removal of fronds, flowers, fruit, stems, or loose petioles that may create a hazardous condition. Palms also may be pruned for aesthetic reasons to eliminate sprouts and stems or dead fronds and seedpods. Live, healthy fronds should not be removed. If they must be removed, however, avoid removing those that initiate above horizontal (Figure 10). Fronds removed should be severed close to the petiole base without damaging living trunk tissue. Climbing spikes should not be used to climb palms for pruning.

Pruning Conifers

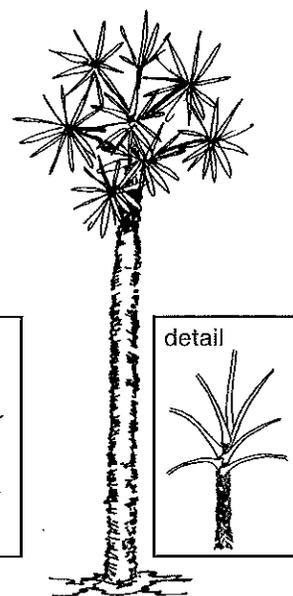
Some pruning types are not appropriate for all conifers. For example, branch spacing and scaffold limb development in conifers usually are not necessary. Thinning on spruces and firs rarely is needed, although in windy area thinning (spiral thinning) could reduce wind resistance and therefore tree failures. Pine growth may be managed by shortening new growth (candles) and removing older needles rather than branch removal. Few conifers respond well to pollarding or reduction.

Palm Pruning

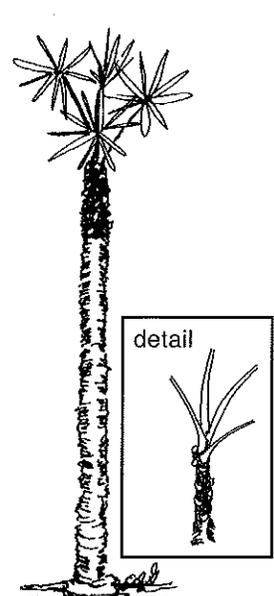
Before pruning



Proper pruning



Overpruning



Consider treating nutrient deficiencies along with pruning. Pruning nutrient-deficient palms could cause symptoms to appear in remaining foliage. Remove lower fronds that are chlorotic or dead. There is no biological reason to remove live green fronds on palms. Removing live green fronds is not known to reduce future pruning requirements.

Remove lower fronds that are dead or more than about half chlorotic. It is best for the palm if green fronds remain intact. (If you decide to remove green fronds, the ANSI A300 pruning standard advises never to remove those growing above horizontal.)

Overpruned palms look terrible, have slow growth, and can attract pests. In the detail above, you can see that many upright fronds were removed. Green fronds are almost always removed during this overpruning.

Figure 10. Palm pruning primarily removes dead or chlorotic fronds.

Branch Attachment

When branches remain small relative to the trunk diameter, a swollen collar often develops around the base of the branch. The collar is formed by overlapping and deflected branch and trunk wood (Figure 11). The overlapping wood makes a union strong. Inside the collar on most trees is a unique chemical barrier called the branch protection zone (Figure 11). Its function is to retard the spread of decay organisms into the trunk. If the collar is removed or severely damaged, decay can more easily enter trunk wood and lead to defects.

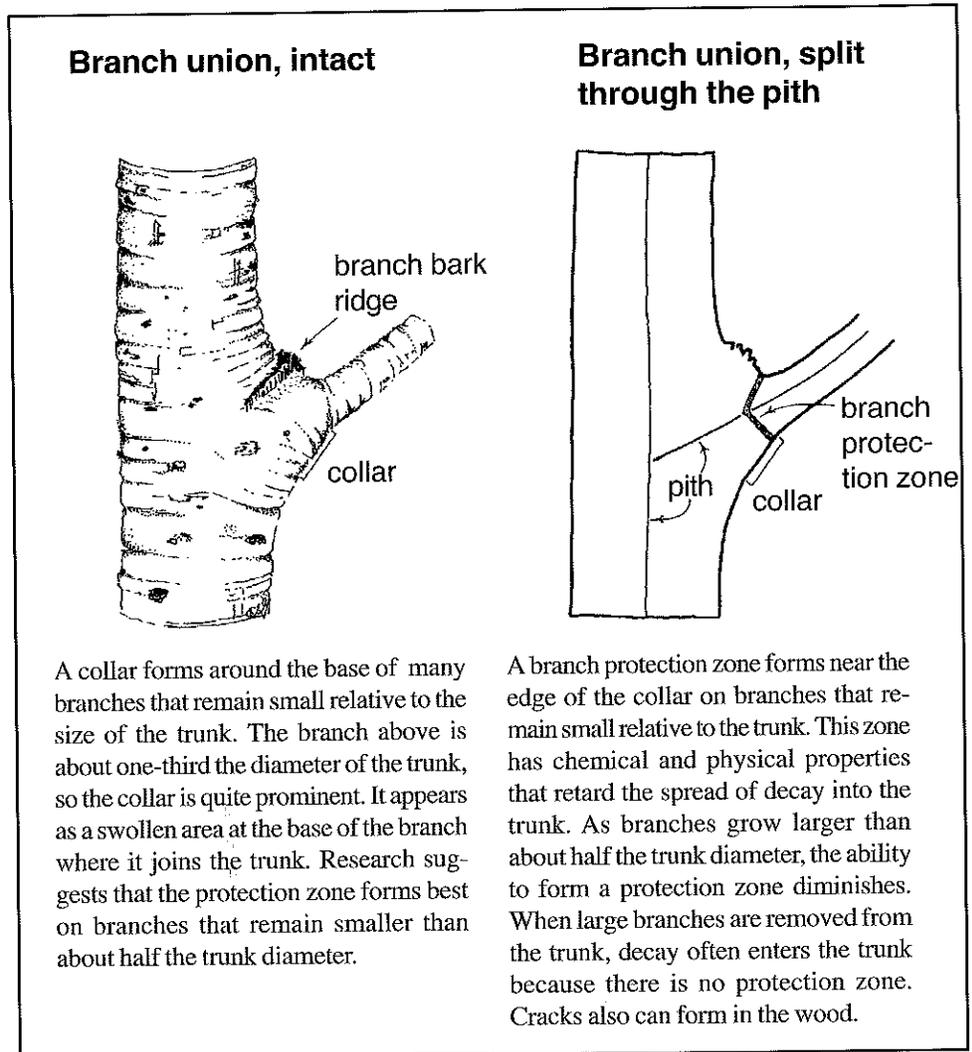


Figure 11. A collar containing a branch protection zone forms when branches remain small compared to the trunk.

When two stems of approximately equal size (codominant stems, diameter ratios greater than 80 percent) arise from a union, there is little overlapping wood (Figure 12). The result is a weaker union. Decay can enter when one stem is removed because there is no branch protection zone at the base of a codominant stem. The union is even weaker when included bark is part of the condition. Included bark becomes trapped and embedded inside the union as the two stems grow and develop. This condition weakens the union, making the tree prone to failure at that point. There is no traditionally shaped branch bark ridge at the top of the union when included bark is present (Figure 13). Branches and stems with included bark should be removed or shortened on young trees. Removal on large trees may not be a good option because of the potential for decay. Reducing the stem's length or installing a structural support system (see *Best Management Practices: Tree Support Systems*) can minimize the likelihood of the limb failure.

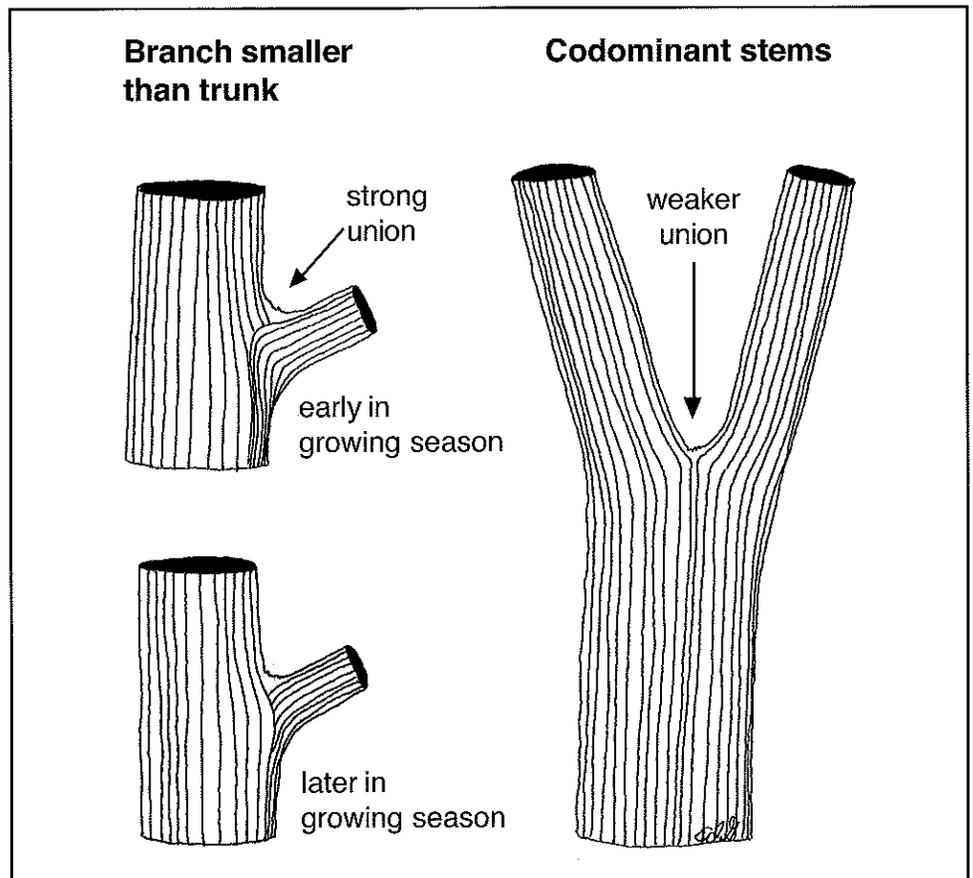
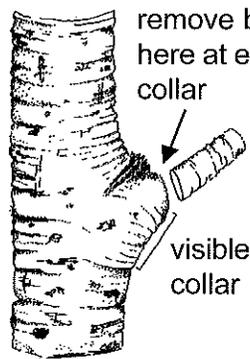


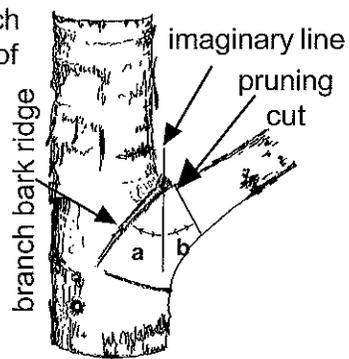
Figure 12. Small branches are well connected to the trunk as a result of overlapping trunk and branch tissue in the union (left). Codominant stems are not as well connected because wood tissue does not overlap in the union (right).

Visible collar



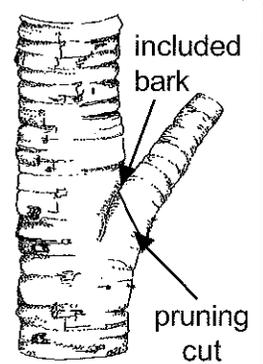
Make the pruning cut just outside the edge of the visible collar. The collar is the swollen area at the base of the branch. If you make the cut here, the branch protection zone remains intact, and decay usually is excluded from the trunk. If the cut is made closer to the trunk, the protection zone is removed, and decay and cracks could occur in the trunk. Do not leave a stub beyond the collar. Leaving a stub could result in the spread of decay into the trunk.

No visible collar



Without a visible collar, construct an imaginary line parallel with the trunk. Estimate angle *a* between the branch bark ridge and the imaginary line. Angle *b* should be greater than or equal to angle *a*. Make your pruning cut where the top of the branch makes an abrupt turn (see pruning cut arrow) into the union. Another guideline is to make the cut to minimize the size of the pruning wound—that is, cut perpendicular to the top of the branch.

No collar and included bark



To remove a branch with included bark and no visible collar, cut through the branch as far down into the union as possible without cutting into the trunk. Never cut below the point where the exposed included bark crack ends. Be careful not to injure trunk tissue when making the cut. If doing so is difficult because of the large size of the branch or the shape of the union, cut farther out on the branch than indicated here.

Figure 13. Removing branches from trunks or from parent branches.

Pruning Cuts

Three general types of cuts are used in arboricultural pruning: branch removal cut (thinning cut), reduction cut, and heading cut. Removal cuts are preferred because they leave the branch protection zone intact.

Branch Removal Cut (Thinning Cut)

When removing a branch at its point of origin on a trunk, stem, or larger branch, make the cut as close to the trunk as possible without cutting into the branch bark ridge or branch collar and without leaving a stub (Figure 13). The cut should leave a smooth surface with no jagged edges or torn bark. If there is no collar, the top of the cut should be located where the top of the branch makes an abrupt upward turn into the union. The correct position varies among trees and branches. Pruning here most closely simulates where branches are shed naturally. The bottom of the cut can be located according to Figure 13. Except on large limbs, the branch protection zone allows for compartmentalization of the wound. If there is a bark inclusion in the union, cut as far down into the union as possible without injuring trunk wood.

Large or heavy branches should be removed using three cuts. The first one undercuts the limb 1 to 2 feet (0.3 to 0.6 m) out from the parent branch or trunk. The undercut reduces the chance of the branch “peeling” or tearing bark as it is removed. The second cut is the top cut, which on small branches should be made directly above the undercut or slightly farther out on the limb than the undercut. The third and final cut is to remove the stub carefully without tearing bark below the cut.

With large trees, branches often need to be lowered rather than dropped to the ground to reduce damage to the tree and objects below the tree. This procedure is done with ropes, cranes, or other equipment. Details on these procedures can be found in *The Art and Science of Practical Rigging* (DVDs and accompanying book published by the International Society of Arboriculture).

When removing a dead branch, the final cut should be made just outside the collar of living tissue (Figure 14). If the collar has grown along a dead branch stub, only the dead stub should be removed. The collar contains live tissue and should not be injured or removed.

Reduction Cut (Cutting to a Lateral, Lateral Cut, Drop-Crotch Cut)

A reduction cut shortens a limb or branch back to a smaller lateral branch or similarly sized limb (Figure 15). Reduction cuts commonly are used in

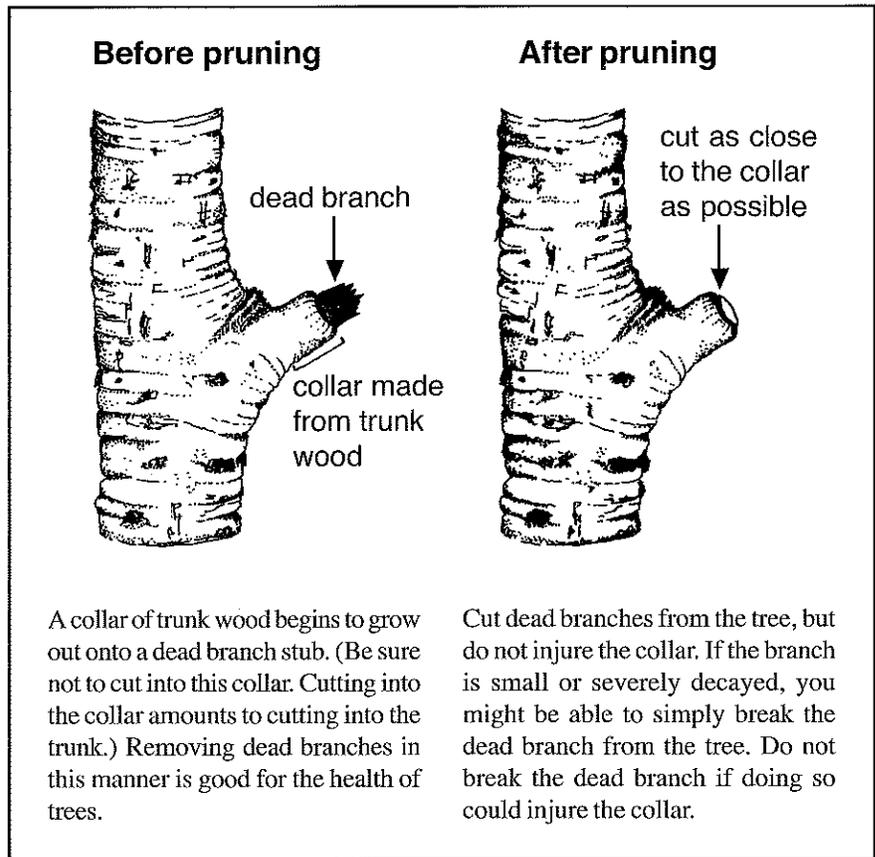


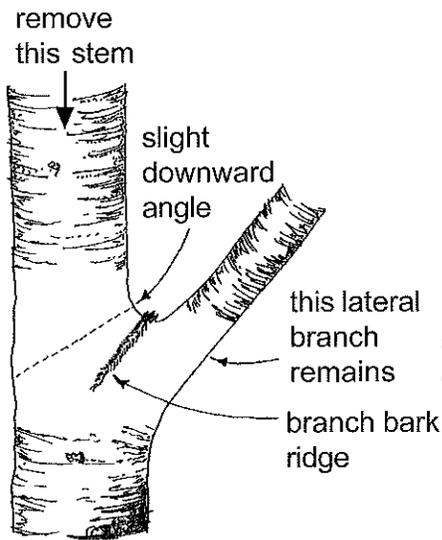
Figure 14. Removing a dead branch should not remove the swollen collar.

structural pruning or when reducing tree size. A stem is cut back to a lateral capable of sustaining the remaining limb and assuming the terminal role. A common rule of thumb is that the remaining lateral branch should be at least one-third to one-half the diameter of the removed portion. At such a size, the lateral branch should be able to produce enough energy to keep the parent branch alive, and enough growth regulator should be present to suppress excessive sprouting on many species. This rule varies with tree species, age, and condition, and with climate. Old, stressed, or mature trees could decline or become more stressed if too much foliage is removed.

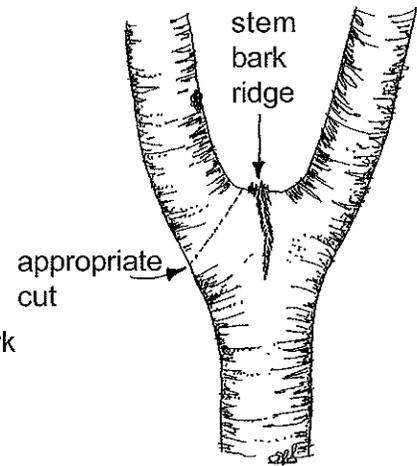
When possible, avoid large reduction cuts (more than 2 inches [5 cm] diameter) on permanent scaffold limbs. Avoiding large cuts is less important on limbs that will be removed from the tree later. On permanent branches, it also is important to consider the ability of the lateral branch to sustain the limb. Cutting back to

Reduction Cuts

Removed stem larger than branch



Stems of equal size



Determining where to make an appropriate reduction cut: To reduce a stem back to a lateral branch, make the cut at a slight downward angle without damaging the remaining stem or cutting any part of the branch bark ridge.

Determining where to make an appropriate reduction cut: Begin the cut just beyond the edge of the stem bark ridge. Cut at an angle to minimize the size of the exposed pruning wound. This location is approximately along the dashed line. There is no natural boundary to resist decay inside the cut stem from reduction cuts.

A reduction cut removes a stem or branch back to a lateral branch or stem that is large enough to assume the terminal role. Typically, this lateral branch should be at least one-third the diameter of the removed portion. If the lateral branch that remains is less than one-third the diameter of the removed stem, then the cut is considered a heading cut. A heading cut is considered inappropriate on most landscape trees. A reduction cut may cause some decay behind the cut. The extent of decay depends on the diameter of the cut and the tree species. Larger-diameter cuts (greater than about 2 to 3 inches [5 to 7.6 cm]) are likely to cause more decay than smaller cuts.

Figure 15. A reduction cut shortens a stem back to a lateral branch.

a lateral that is insufficient in size is much like making a topping or heading cut. A pruning cut that reduces the length of a branch or parent stem shall be made at a slight downward angle relative to the remaining stem and not damage the remaining stem. Smaller cuts shall be preferred. (Figure 15). Cutting *toward* the branch bark ridge reduces the risk of the union splitting out.

Trees do not compartmentalize this type of wound as well as the wound created following a removal cut. The ability of the tree to compartmentalize the wound is a function of the size of the cut, the age of the cut stem or branch, tree vigor or vitality, species, and perhaps the time of year. The smaller the cut and the more vigorous the tree, the better the wound closure and compartmentalization.

Heading Cut

A heading cut (topping cut, lopping cut) is made between branches. This type of cut leaves a stub. These cuts rarely are appropriate on established trees. They can, however, be used on current season's growth to remove old flower heads and developing fruit or to reduce the length of a branch or sprout to improve appearance. Heading cuts are used in the first year of pollarding. Heading should not be used to reduce the height or size of trees in other instances. This practice is called topping and is extremely damaging to shade trees. Shearing (or rounding-over) large-maturing trees also is inappropriate because it causes a profusion of sprouts that grow rapidly into a dense mass of foliage. This practice spoils good tree architecture and can significantly increase maintenance requirements. Shearing is appropriate and commonly practiced on shrubs to maintain size.

Wound Dressing

Wound dressings are treatments applied to pruning cuts or other tree wounds. Traditionally, they were formulated with asphalt-based products in paint or spray form. Wound dressings once were thought to accelerate wound closure and reduce decay. Research shows that these products do not reduce the spread of decay. However, studies have shown beneficial effects of wound dressings in reducing borer attack and oak wilt infection and controlling sprout production and mistletoe. Wound dressings are used primarily for cosmetic purposes, and neither are required nor recommended in most cases. If a dressing must be applied, only a light coating of a nonphytotoxic material should be used.

How Much to Prune

Energy reserves (starch, sugars, and oils) are stored in branches, stems, trunk, and roots. This energy can be preserved by removing the fewest number of live branches necessary to accomplish the desired objective. Excessive branch removal depletes these reserves and reduces the ability of the tree to photosynthesize more energy. There should be a good reason to remove more than 25 percent of the live crown in a single year. Many trees generate adventitious sprouts in response to overpruning as they attempt to replace the stored energy. Live branch pruning, however, is an essential ingredient to forming good structure, so it is a necessary procedure in an urban tree care program.

When to Prune

The best time to prune live branches depends on the desired results. Removal of dying, diseased, broken, rubbing, or dead limbs can be accomplished any time, with little negative effect on the tree.

Growth is maximized and defects are easier to see on deciduous trees if live-branch pruning is done in the winter or before growth resumes in early spring. Pruning when trees are dormant can minimize the risk of pest problems associated with wounding and allows trees to take advantage of the full growing season to close and compartmentalize wounds. Trees with Dutch elm disease should have diseased branches removed as soon as a branch shows flagging.

The timing of pruning can be an important part of a Plant Health Care program. For example, one of the ways to reduce the spread of oak wilt or Dutch elm disease fungus is to prune during the dormant season and avoid pruning susceptible species during the time of the vector beetle flight in areas where disease is a problem.

Plant growth rate can be reduced if live-branch pruning takes place during or soon after the initial growth flush. This is the period when trees have just expended a great deal of stored energy to produce roots, foliage, and early shoot growth, so pruning at this time usually is not recommended because of the potential stresses. Do not prune live branches from stressed trees at this time because they need all their live foliage to help recover.

Flowering can be prevented or enhanced by pruning at the appropriate time of the year. To retain the most flowers on landscape trees that bloom on current season's growth, such as crapemyrtle (*Lagerstroemia* spp.) or linden (*Tilia* spp.), prune these trees in winter, prior to leaf emergence, or in the summer just after bloom. Plants that bloom on last season's wood, such as crabapples (*Malus* spp.) and cherries (*Prunus* spp.), should be pruned just after bloom in order to preserve the flower display. Fruit trees can be pruned during the dormant season to enhance structure and distribute fruiting wood, and they are pruned after bloom to thin fruit.

Certain species of trees, such as maples (*Acer* spp.) and birches (*Betula* spp.), drip sap (bleed) when pruned in the early spring when sap flow is heavy (Table 4). Although unattractive, sap drainage has little negative effect on tree growth or health. Some of the sap dripping can be avoided by pruning in summer or at other times of the year.

Table 4. Trees that often drip sap (bleed) when pruned in late winter or early spring.

Avocado (*Persea americana*)
Birch (*Betula* spp.)
Cottonwood (*Populus* spp.)
Elm (*Ulmus* spp.)
Flowering dogwood (*Cornus florida*)
Hackberry (*Celtis* spp.)
Honeylocust (*Gleditsia triacanthos*)
Magnolia (*Magnolia* spp.)
Maple (*Acer* spp.)
Mesquite (*Prosopis* spp.)
Poplar (*Populus* spp.)
Silk-oak (*Grevillea robusta*)
Walnut (*Juglans* spp.)
Willow (*Salix* spp.)
