University of California Cooperative Extension
Central Coast & South Region

Center for Landscape and Urban Horticulture

Pruning Trees

Pruning Trees at Planting

Landscape trees should not be pruned at planting time except to remove damaged branches or to correct those that show serious structural problems, such as branches with extremely narrow crotch angles and branches that cross or rub other branches. (Fruit trees are often treated differently.) In the past, it was commonly recommended to prune a portion of the shoots at planting. Recent research, however, has shown that the removal of terminal buds and leaf area can delay and reduce root system growth. Because the survival and establishment of a transplanted tree depend greatly on the growth and development of new roots, the practice of pruning at transplanting is no longer standard.

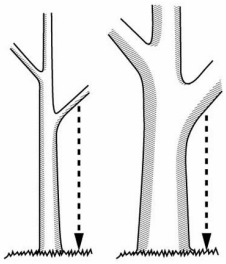
There is one exception, however. If irrigation is unavailable after planting, or if severe drought is anticipated after planting, limited thinning-type pruning may increase the chances of tree survival. Although this pruning may restrict root growth, thinning cuts remove foliage and thereby reduce transpiration and water loss.

Pruning To Train Young Trees

Directing the growth of young trees is important if the trees are to perform properly in the landscape when mature. The growth habit of a plant and its landscape use largely determine the extent to which a tree must be trained to obtain the desire form. Pruning is usually the most effective way to direct the growth habit of a plant. Young trees with a strong central leader, like conifers and liquidambar, may need little or no pruning. Other tree species, such as Chinese pistache and some flowering fruit trees, lack a strong central lead, have more irregular growth, and need a higher degree of training. Street trees should have higher scaffold branches than trees used for visual screening or windbreaks.

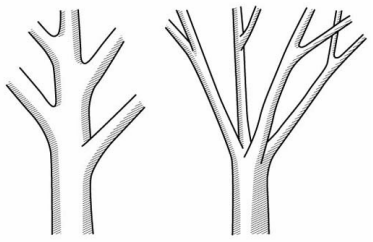
Prune a tree only enough to direct its growth effectively and correct any structural weaknesses. The height of the first permanent branch above the ground depends on the tree's intended landscape use. The lowest scaffolds on trees in lawn and garden areas are normally no higher than 6 to 8 feet (1.8 to 2.4 m) from the ground. Those on trees along streets and sidewalks should be 8 feet (2.4 m) above a sidewalk and 8 to 10 feet (2.4 to 3 m) above the street. The position of a limb on a trunk remains essentially the same throughout the life of the tree (fig. 13.12). Branches selected for permanent scaffolds should have wide angles of attachment, smaller in diameter than the trunk, and 18 to 24 inches (45 to 60 cm) apart vertically (fig. 13.13). Radial branch distribution should allow five to seven scaffolds to fill the circle of space around the trunk.

Fig. 13.12



Branches retain their position on the trunk but become slightly closer to the ground as they increase in diameter. Source: After Harris et al. 1981, p.11.

Fig. 13.13

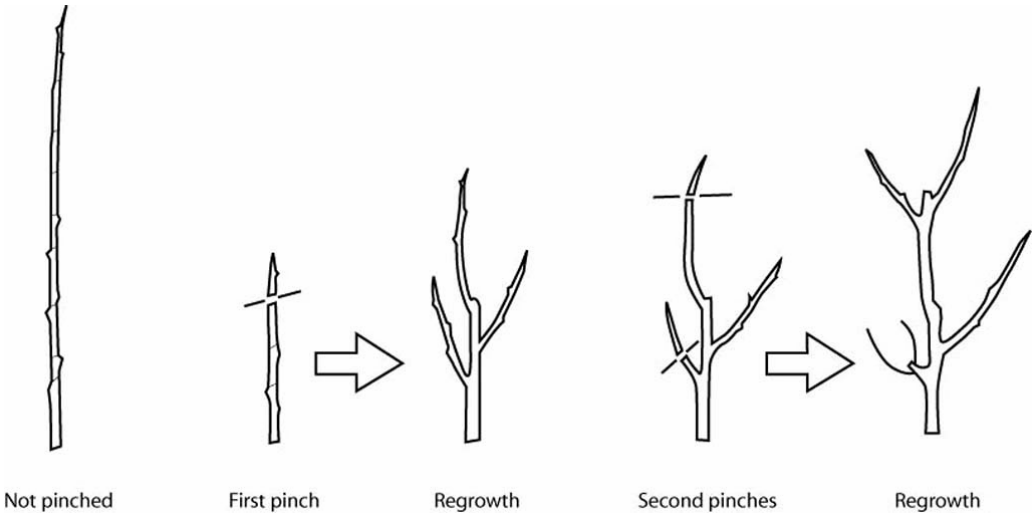


Well-spaced branches are less likely to split or break (left) than those close together (right). Source: After Harris et al. 1981,p.12.

Many trees produce an abundance of lateral growth. Direct this growth during the growing season by heading back or thinning out shoots competing with the leader or interfering with those selected for scaffold branches. During the first and perhaps the second season, more shoots should be left unpruned than will finally be selected for scaffolds, allowing more choices later for selection of the best lateral branches. Often, on lightly or unpruned trees, the more vigorous branches will be naturally well-spaced, and other branches become rather weak.

If a tree seems reluctant to develop laterals for future scaffolds, pinch out (head back 1 to 2 inches [2.5 to 5 cm]) the tip during the growing season when the growing point reaches a height at which a lateral branch is desired (fig. 13.14). Select the most vigorously growing new shoot that developed from the buds below the pinch as the new leader. Then choose as a lateral a second developing shoot growing in the desired direction by pinching the tips of the other shoots that were formed. Repeat this process as the leader develops until the desired number and spacing of laterals is obtained. A vigorously growing tree may permit forcing as many as three well-spaced laterals where they are wanted in one season.

Fig.13.14 During the growing season, a nonbranching leader can be pinched to induce development of laterals. The two pinches induce branches to grow at the heights desired (leaves removed). Source: After Harris et al. 1981, p.14.



Pinching during the growing season is much more effective, requires removing a much smaller quantity of shoot material, and results in less dwarfing effect of the plant than dormant pruning. A growing-season pinch of only 1 to 2 inches (2.5 to 5 cm) is just as effective and will make unnecessary the removal of a large branch later on during the dormant season. Without pinching during the growing season, the leader would require severe heading to the height at which the lowest lateral is desired during the dormant season.

Pruning Mature Trees

Once well-spaced scaffold branches and the main structure of a tree have been selected, usually by the third or fourth year, the tree will probably need little or no pruning for several years, especially if it is the right tree for the right place and purpose. Mature trees, however, may need to be pruned for health and appearance, size control, and flowering and fruiting response. Pruning the leader of a central-leader tree and wholesale topping (heading back) of mature trees are inappropriate. These practices destroy a tree's natural form, create large wounds, and force many vigorous upright shoots that are weakly attached (fig. 13.15).

Removal of dead, weak, diseased, and insect-infested limbs will improve tree health and appearance. Remove low, broken, and crossing limbs for appearance and safety. Open up the top of the tree to let in more light so that interior leaves and branches can remain healthy. Judicious pruning consisting of moderate thinning can open a tree to view and emphasize an attractive or picturesque feature to the viewer.

Although pruning for size control is a less preferred alternative to initial proper species selection, it may be necessary in some instances. If trees were planted too closely together or if the particular function or purpose for which a tree was originally selected has changed, size control through pruning could be the best alternative to removal or replanting.

Thinning, perhaps even the complete removal of some limbs, can be used to reduce the height and spread of a tree. A thinned tree retains its natural shape and is less prone to the formation of vigorous water sprouts than a headed tree (fig. 13.16). Pruning for size control, however, is most effective as soon as a tree reaches the desired size. Delaying pruning until the tree is larger makes pruning more difficult and less effective, leaves more noticeable scars, and encourages excessive growth. Heading and stubbing, while much more rapid and drastic in their effect, are in most cases much less desirable.

Severe pruning delays the onset of flowering in species that flower on 1-year-old growth, such as the flowering fruit trees. Once the tree has begun flowering, only a light annual thinning to remove 10 to 15 percent of the leaf area and to reduce crowding or weak branches is usually necessary. Perform such thinning at or near the end of the bloom period to encourage vigorous growth on which to bear next year's bloom.

On the other hand, trees flowering on current year's growth, such as crape myrtle, Japanese pagoda tree, and jacaranda, usually flower earlier and more profusely if pruned to stimulate and maintain vigorous growth. Plants with such flowering habits should be pruned more severely and during the winter before growth begins.

Fig.13.15

A headed tree will force many vigorous upright shoots, causing the tree to lose its natural form. Source: After Harris et al. 1981, p.22.

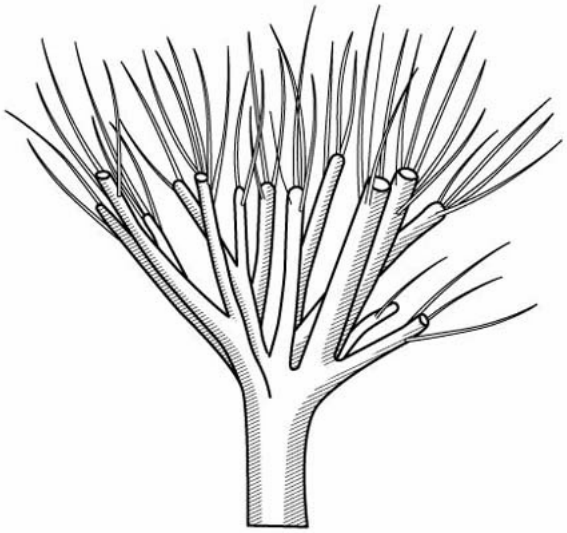
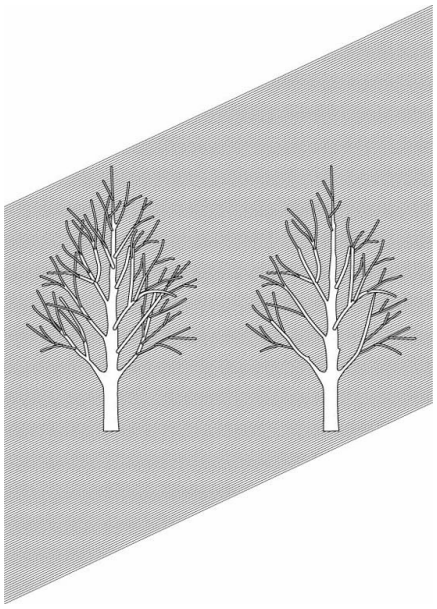


Fig. 13.16



Thinning reduces height and opens up a mature tree (left) retaining the natural appearance and form or the tree (right). Source: After Harris et al. 1981, p.22.

Pruning Conifers and Other Narrowleaf Evergreens

Although conifers usually require less pruning than broadleaf trees, the same basic principles apply for controlling size, creating special effects, and shaping. The crown configuration cannot be controlled as easily as with broadleaf trees. Dead, diseased, crowded, and structurally unsound branches should be removed first. Double leaders should be thinned to one unless the natural growth habit includes several main branches. Encourage branches with wide angles of attachment and smaller than the trunk from which they arise.

Pruning conifers differ from pruning broadleaf trees in several important ways. Conifers usually do not need pruning for spacing of laterals. Several branches arising at or near one level on the trunk seldom subdue the main leader of a conifer; thus, whorls of branches or those arising close together can remain, because it is unlikely they will crowd out the leader. Adequate vertical spacing between individual branches along the trunk occurs naturally in most conifers. The branches may be thinned to reduce wind resistance or to achieve aesthetic effects. For a strong, well-tapered trunk, branch whorls or laterals remain along the trunk.

Growth habit determines the severity of pruning. Conifers with a tall, straight trunk and central leaders are said to have excurrent growth. Almost all conifers are excurrent when young. Conifers are usually most attractive if the excurrent habit is preserved. Thus, the primary pruning removes or subdues any laterals that challenge the leader. Other conifers, like many mature broadleaf trees, develop a wide-spreading crown after forming a short trunk and are said to have a diffuse, random branching habit. Some conifers may develop the diffuse branching habit if they have been propagated by cuttings from side branches. The diffuse branching pattern allows more latitude in pruning.

The distribution of latent buds or growing points often limits the severity of pruning conifers (table 13.3). In some conifers, all growth derives from buds formed in the previous growing season. When the preformed buds have expanded, growth ceases. These trees may have all their lateral buds in whorls just below the terminal bud (most pines), or lateral buds may be scattered along the shoot. Conifers with whorled buds should be pruned back only to active laterals or, in current season's growth, before the needles develop fully. If pruning is done early enough, new buds will develop near the cut for the following season's growth. In conifers with latent buds scattered along the younger shoots, prune back to a latent bud. These buds will become active and develop a new growing point.

Canary Island pine (Pinus canariensis) is a notable exception. Many latent buds survive just under the bark on large branches and even the trunk. Many of these buds grow when stimulated by heavy pruning into old wood or after a fire has killed the smaller branches.

If conditions are favorable, some conifers with preformed buds, including some pines, may have several growth flushes during a growing season. Young, expanding shoots may be pruned in any or all of these flushes. If there are no visible latent buds, pruning into old wood will usually result in a stub from which no new growth will arise.

Other conifer species have buds or dormant growing points (no bud scales formed) with shoots that continue to elongate. Such species usually have abundant latent buds that produce new growth even when severely pruned into old wood. Trees of these species usually have a spiral or random branching habit. Despite their tolerance of severe pruning, these species look most attractive when thinned. Conifers with an intermediate growth habit have a large number of latent buds randomly spaced along stems or retain active laterals or short shoots for many years on older wood. Growth continues as a series of flushes.

Pruning Spreading-Type Narrowleaf Evergreens. Plants such as junipers have a spreading growth habit. Prune junipers by cutting back enough growth to prevent leggy or uninhibited growth and to prevent needles from dropping off lower branches because of shading by upper branches. Cut back the longer branches that develop on top from a few inches to half the branch so the lower branches will be exposed to light, as illustrated in figure 13.17. Cut back some growth annually to prevent plants from getting out of bounds. Pfitzer juniper is an example of a vigorous, spreading narrowleaf evergreen that can produce 12 to 18 inches (30 to 45 cm) of growth annually. It may be necessary to cut back into the previous year's wood to maintain the desired size and shape of the plant.

Fig. 13.17

Spreading-type narrowleaf evergreens. Prune spreaders by cutting back longer upper branches as shown. Long branches should be cut back from a few inches to half the branch, as shown, to prevent shading of lower branches. Source: After Caldwell et al. 1972, p.11.

Pruning Rounded-Type Narrowleaf Evergreens. Brown yew and globe arborvitae are good examples of rounded-type evergreens. They are normally globe-shaped and should not be sheared. Both can be maintained at whatever height and size desired, however. Because brown yew develops as a broad, rounded specimen, prune about one-fourth to one-half of the previous year's growth to keep it bushy and compact. Thinning individual branches, rather than shearing, yields a more attractive, natural-looking growth habit. Globe arborvitae requires little, if any, pruning because of its formal growth habit.

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