



TREES & SHRUBS

General Pruning Techniques

Here are techniques and tips that will enable you to prune just about any landscape plant.

There is nothing quite like getting the pruners in hand and getting out there. So once you get the basics down, go practice.

Timing of Pruning

You must know the species, its condition, and the reasons you are pruning. As always, remove broken, dead, weak, or heavily shaded branches anytime. You can do light pruning about anytime. Remove unwanted growth when the plant is young to prevent large pruning wounds. Training trees for future form is critical and should be done as early as possible. Pruning early means better health for the plant and the pocketbook! Here are some general pruning guidelines:

All Plants

- Pick the right *cultivar* and you should not need to prune as much or as often.
- Remove dead branches, suckers, crossing branches, and other weak stems that do not contribute to the overall form early in the plant's life.
- Summer: Do not prune heavily during hot, dry weather. After an extended drought, wait until the following growing season to see what has died due to water stress. This will help you avoid removing live wood unnecessarily.
- Begin building good structure in trees when the plant is young to avoid large wounds. If you know you will not be able to return to the plant within a year or two, prune at planting. This is not the preferred method, but it is the best way to correct form problems and make small wounds rather than waiting to prune for years.
- The "one-third rule" provides a basic guide. Typically, you should not remove more than a third of the total



Remember that pruning is wounding a plant. The more accurate the cut, the more likely the wound will close over quickly, with little if any decay.

crown of a plant in any one year. This is especially true of mature or older trees. In addition, when thinning, remove a *terminal* (bud or branch) back to a *lateral* bud or branch that is at least a third if not half the diameter of the branch you are removing.

Late summer

- Prune after most of the seasonal growth is complete to slow growth and maintain plant size.
- Do not prune too severely or too early, which may encourage new shoot growth.

Winter

- Delay pruning until late winter or early spring to avoid creating wounds when decay fungi are sporulating in autumn.

Spring

If extensive pruning takes place before spring growth, cold injury may be a problem. Postpone pruning until growth begins in spring or chance of extreme weather is past.

Investigate the influence of timing on infection and development of various vascular or foliar diseases and the flight of boring insects before you prune highly susceptible species. For example, Dutch elm disease is vectored by elm bark beetles. So remove deadwood and infected branches in fall, when adult beetles are not flying. For more information on Dutch elm disease, see the U.S. Forest Service website on "How to Identify and Manage Dutch Elm Disease": http://www.na.fs.fed.us/spfo/pubs/howtos/ht_ded/ht_ded.htm

If your aim is to maximize flowering, take care not to cut off the flower buds. Determine when flower buds develop—in the previous year or the current season's growth.

How can you tell when they bloom? Flower buds are typically much larger than leaf buds, so begin by looking at the buds on the stems. Take note of when the key plants in your landscape flower.

- In general, if a plant blooms before June, then they bloom on old season growth and you should prune them directly after blooming.
- If they bloom later in summer, then they bloom on new growth and can be pruned in their dormant season or before growth begins in the spring.

The final publication in this series, *Individual Plants* (AG-780-04), includes specific recommendations on how and when to prune the most commonly used landscape plants.

Deciduous Plants

- Growing season: Conduct light structural and corrective pruning because it is easier to see what is dead and the wounds close over more quickly while plants are growing.
- Late autumn: Prune species that "bleed" heavily (sap flow from roots to top of plant), such as birch, elm, and maple, before sap begins to flow. Although "bleeding" is seldom harmful to trees, some researchers have found that if heavy and persistent, it can cause bark injury below the pruning cut and retard callousing.
- Dormant season—general pruning: This is the best time to direct growth on young plants.

Evergreens

- Late winter: Prune just before spring growth begins. Many broadleaved evergreens will respond well to this type of pruning.
- Summer maintenance: Prune after growth is complete for the season, when you can slow growth and maintain



Figure 3.1. Heading cuts to reduce plant height. Drawing courtesy of answers.com.

plant size much easier. Do not prune too severely or too early, which may encourage new shoot growth.

Pruning Methods

Size Reduction

There are a number of acceptable ways to reduce plant size. *Heading* or *heading back* removes currently growing or one-year-old shoots back to a bud or an internode. You can also cut an older branch or stem back to a stub or a small twig (one that is less than a third to half the size of that being removed). There are several ways to head back a plant: *pinching*, *tip pruning*, and *shearing*. Professionals refer to the heading of large branches or trunks as *topping* or *stubbing*, and this is an inappropriate pruning practice.

In response to heading young branches and leaders, new growth develops from buds just below the cut. This new growth may be quite vigorous, growing densely and upright. When you head back (top) large branches or trunks, *latent buds* grow and are attached only by the thin layer of current season growth. Branches formed by these buds are typically weakly attached. This explains why topping can lead to an increased hazard due to branch failure.

Thinning or thinning cuts are used to train young trees and shrubs, to shorten branches, to control direction of growth, and to remove unwanted branches. When thin-



Figure 3.2. Thinning cut-back to lateral branch to control direction of growth and reduce height.



Figure 3.3. Branches with a large aspect ratio (lowest branch on right) or codominant stems (uppermost branches) have a barely visible branch collar, or none at all as in the case of all codominant stems. Red lines indicate where to make the cut on these branches. This pruning should be accomplished as soon as possible to avoid the need for larger wounds.

ning, remove a lateral branch at its point of attachment (*branch collar*) or the shortening of a branch to a lateral large enough to assume the role of the terminal (the lateral branch should be at least a third to half the size of that being removed). Reducing the height of a tree by thinning a terminal to a sufficiently sized lateral is termed *crown reduction*. When a thinning cut is made, no stub is left, unlike when making a heading cut. When thinned, a plant will not grow back as vigorously as when headed back. Thinning cuts direct growth, retain a more natural shape, and allow greater light penetration, thereby increasing interior growth. A thinning cut is also used to “*elevate*” limbs, particularly on trees. This procedure is also referred to as *crown raising*. Nursery or landscape professionals remove lower branches at a branch collar to obtain clearance for equipment and human or vehicular traffic.

Cutting small branches or twigs

Cut back to $\frac{1}{4}$ -inch above a vigorous branch or bud that is pointing in the direction in which you want the plant to grow. Do not leave a stub (which could make it difficult for the plant to seal the wound) or cut too close to the bud or branch as that could damage the branch collar.

Cutting larger branches

Use a thinning cut to remove branches back to the *branch collar*. The collar is an area of tissue where the branch attaches to the trunk or to a larger branch, often somewhat swollen. The branch collar is made up of protective tissue that chemically protects the interior wood and allows the *cambium* to grow over the wound, sealing it off with a protective cover. If you remove the collar by making a flush cut, you remove the protective zone and increase the chance of fungal organisms infecting the plant. “Natural target pruning” uses the branch collar and the *branch bark ridge* (see pruning terms, p. 13) to determine the location and angle of the cut. When determining the angle of the cut, you should be able to visualize a 45° angle between the cut line and the branch bark ridge if present (see Figures 3.3 and 3.4).

Branch collars are not always visible. Some branches do not form a distinct collar, so there is a smooth transition from the trunk to the branch. Branches with *included bark* do not have a collar, nor do *codominant branches* (Figure 3.3).

If you need to remove a limb over 2 inches in diameter, you should use the three-cut method (see Figures 3.5 through 3.6). The first cut is an undercut and prevents bark from ripping potentially down into the collar. This cut should be between 4 to 6 inches from the collar, depending on the diameter of the branch. The second cut removes the branch’s weight. The final cut removes the stub left at

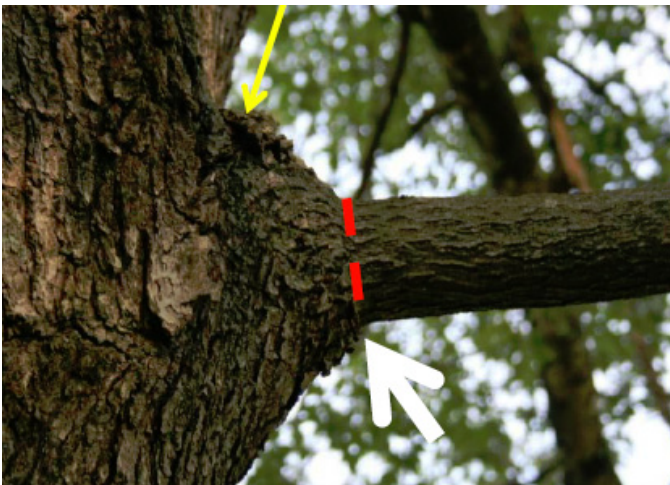
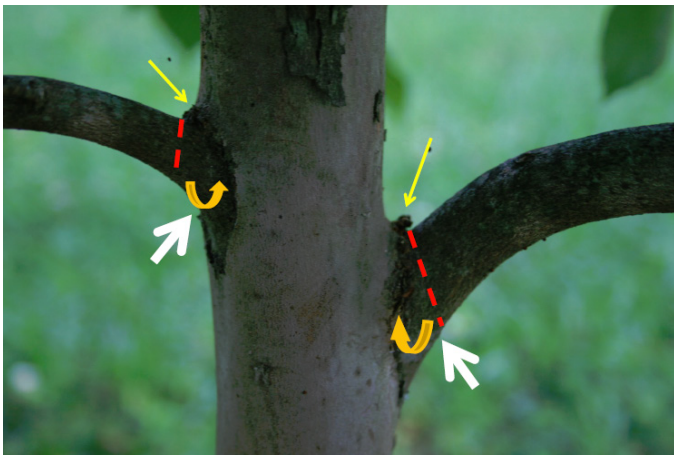


Figure 3.4. Locating the branch collar and branch bark ridge are the keys to implementing “natural target pruning.” The thin yellow arrows indicate the branch bark ridge that helps determine angle of the cut. The dashed red lines indicate where the cut should be made on each of these three examples. The white arrows indicate the branch collar. The collar is not always visible (bottom), and will be different for every species and even every branch. The gold arrows indicate the approximation of a 45° angle formed between the branch bark ridge and the collar cut.



Figure 3.5. This shows a branch prior to pruning using the three-cut method. The yellow arrow indicates the branch bark ridge, and the red arrow indicates the approximate location of the branch collar—which is not readily visible on this red maple.



Figure 3.6. The first cut is the undercut (pink arrow). This prevents bark ripping, which not only prevents good wound closure but also is unprofessional.



Figure 3.7. Remove the weight of the branch with the second cut.

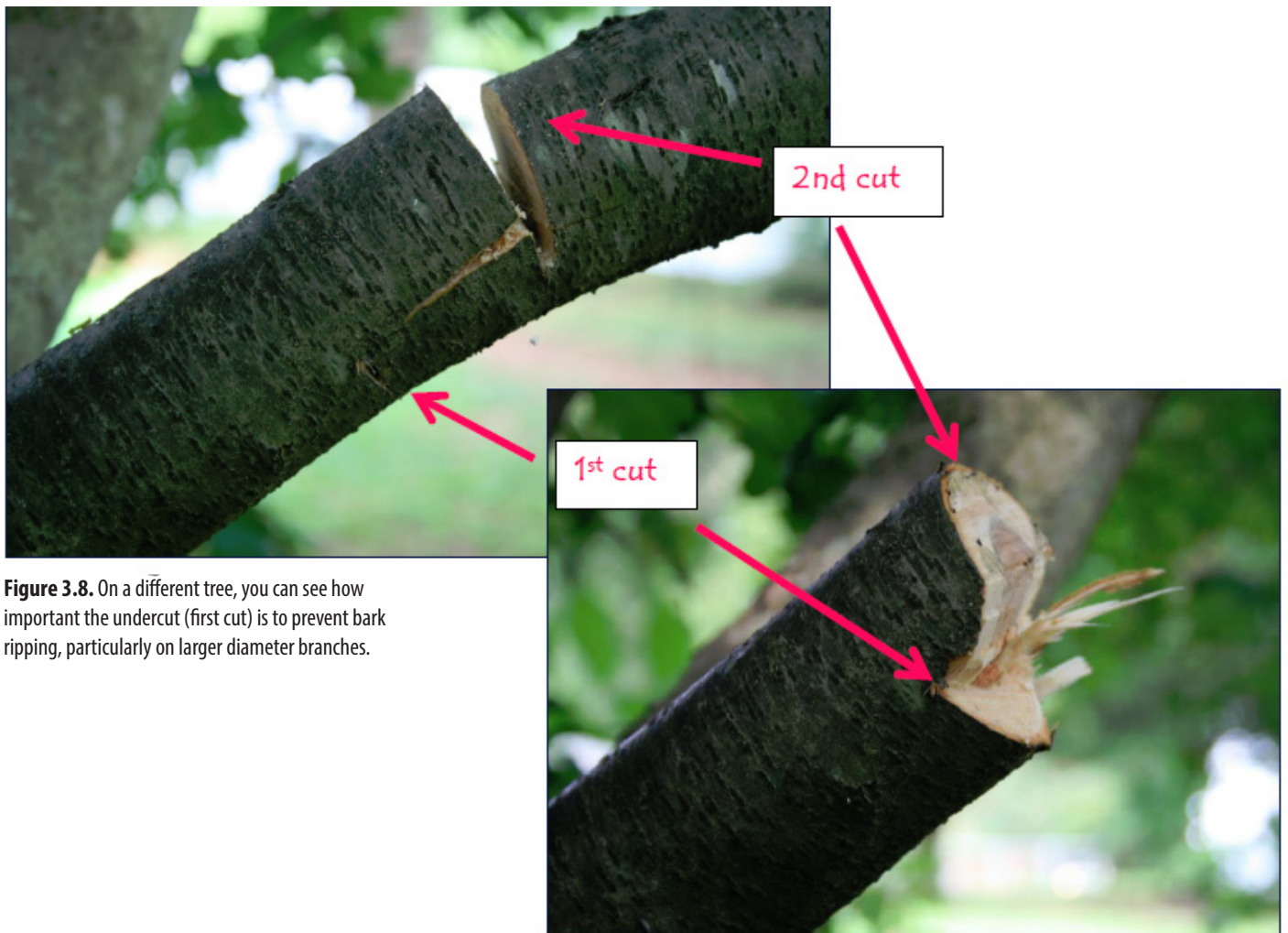


Figure 3.8. On a different tree, you can see how important the undercut (first cut) is to prevent bark ripping, particularly on larger diameter branches.

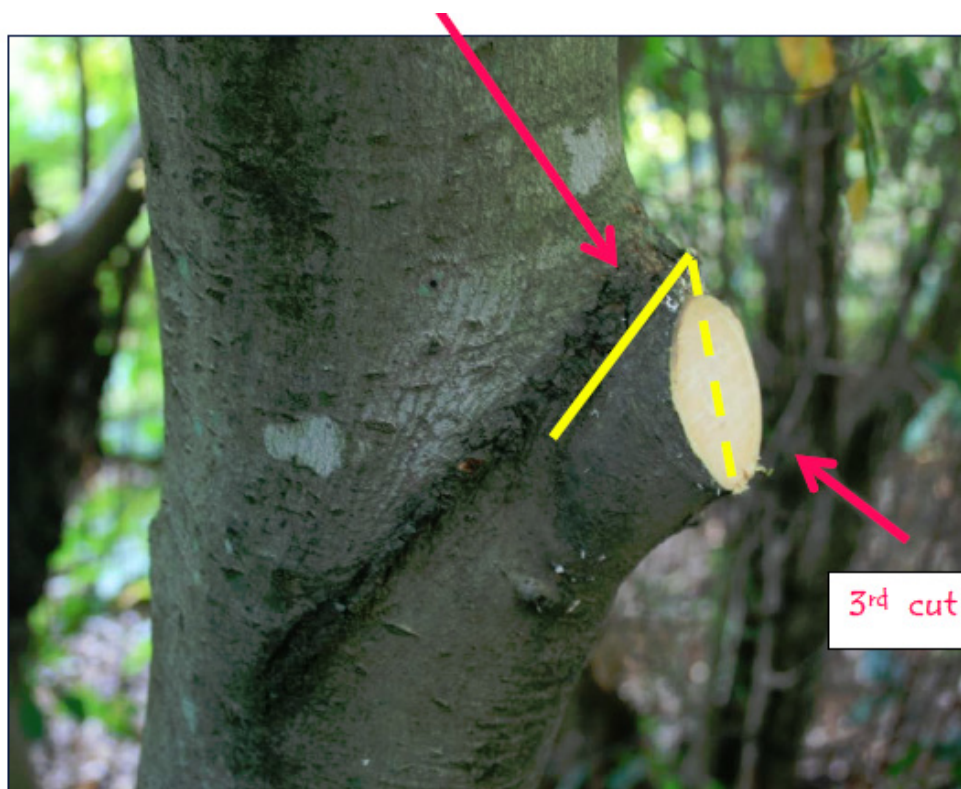


Figure 3.9. Remove the remaining stub with the third and final cut, at the collar. You can see that the angle between the cut and the branch bark ridge that guides your cut approximates a 45° angle.



Figure 3.10. Not only should landscape managers have removed this branch long before it got to this size, but they made two other mistakes. What are they?*

the collar. The placement (proximity to branch collar), angle (which determines both the size and shape of the wound), and proficiency (smooth, clean wound) of the third and final cut will determine how quickly and well the plant closes the wound. This is the most important cut. When cutting a limb of this size, use a handsaw to make the cleanest possible cut.

Never apply wound paint or tar as this is used for cosmetic reasons and may actually lead to a greater chance of infection. Tar keeps moisture and darkness in the wound, creating the perfect environment for disease organisms.

On occasion a plant will “tell you” that you made an incorrect cut. If you make a flush cut or leave a stub behind, the plant may respond by producing *adventitious growth*. This growth begins when a bud develops from places other than a shoot *apical meristem*, such as on stems, roots, or leaves.

*Answers: (1) They did not make an undercut, and (2) they cut into the collar by making a flush cut.



Figure 3.11. Above are examples of flush cuts. The protective tissue in the branch collar was removed, so the tree will not be able to seal off the wounds and there will be a greater chance of insect and disease issues. Below is a tree where branches were removed properly a few years earlier. The chemical protective zone has closed the wounds over, and in time there will be no evidence of the cuts (unless you cut into the tree).



Adventitious growth is not necessarily bad. We use this biological function to our advantage when propagating plants by vegetative cuttings. Also, if terminal or lateral buds are lost, adventitious growth can allow plants to continue to elongate.

Choosing which branches to remove is a matter of science and art. Take your time. Make the easy cuts first. Remove diseased, damaged, and crossing branches, then weak branches and those growing toward the middle of the plant. Next, remove any V-crotch branches with included bark and



Figure 3.12. Both of the pictures above indicate what can happen with an incorrect cut—adventitious growth forms: (top) *Ficus carica*, common fig, and (bottom) *Ilex* × *Nellie R. Stevens*, Nellie Stevens holly.

thus weak attachment. After you make these cuts, step back and look over the plant from all sides. This will give you perspective and allow you to prune in keeping with the plant's natural form. This is where the art comes in. When you have to make a choice between two branches, consider which is growing in the desired direction, which has the wider angle of attachment to the trunk, and which appears healthiest. Look for a branch with an angle between 45° and 90° . *U-crotches* rather than a tight *V-crotch* are preferred, as *U-crotch* branches have a stronger attachment to the trunk.

The “one-third rule” is helpful to keep in mind if you are just learning. In many cases, you should not remove more than a third of the total crown of a plant in any one year. As you become more proficient at pruning, you must begin to consider the age of the plant to determine the *pruning dose* appropriate. A young, healthy tree can tolerate a pruning dose of around 50 percent, while healthy medium-aged trees tolerate a dose of about 25 percent and old trees in good health can stand no more than 10 percent.

In addition, when thinning, remove a terminal (bud or branch) back to a lateral bud or branch that is at least a third if not half the diameter of the branch you are removing. By doing so, you will be leaving sufficient leaf area to take over the photosynthesis work lost with the branch removed. If you do not have one branch that meets that requirement, it is fine to take the terminal back to two or more laterals that equal a third or half the diameter. As trees get older, your goal is to remove only dead or damaged branches. If you have trained the plant well, that will be the case. In some instances, you may be forced to remove a large limb because it poses a safety hazard. In that case, be aware that the wound might never close over. This does not mean certain doom; it does mean a bit more stress for the tree and greater risk of decay causing disease infection.

Remember that pruning is wounding a plant. The more accurate the cut, the more likely the wound will close over quickly, with little if any decay.

Unlike animals, trees cannot heal their wounds. Sometimes, depending on the severity of the injury an animal receives, there will be a scar but the tissue is repaired. Woody plants cannot repair cells, however, so they wall off the wound from the surrounding tissues. This system is termed CODIT, or *compartmentalization of decay in trees*. It is what allows trees and shrubs to endure injuries without succumbing to them.





Figure 3.13. When injured a tree closes the wound off from surrounding tissues, this is CODIT.

This is critical to a plant's survival because plants cannot move out of the way of danger—such as construction, lawn mowers, or storms.

Maintaining Shrubs

Shrubs provide different pruning challenges than trees simply because there are so many different species. Often shrub pruning will require a greater time investment because it is frequently done yearly to maintain a plant's function in the landscape, such as for hedges. Understanding a few basic pruning techniques will help you determine how and when to prune shrubs.

We can place shrubs in a few categories. Knowing the category in which your plants fit will help you determine when to prune (in most cases). We can generally separate shrubs as follows:

Deciduous (loses leaves every year)

- Bloom on 1-year-old wood
- Typically bloom in later winter or early spring, before June.
- Bloom on new wood (formed that year)
- Bloom in summer or fall—late in June or after

Broadleaved evergreen

Broadleaved evergreens have broad rather than needlelike leaves, some of which are lost each year; these leaves are typically 2 to 3 years old. Some broadleaved evergreens bloom in spring, while others bloom in summer. Many are grown for foliage and not necessarily, flowers, such as aucuba. For



Figure 3.14. These *watersprouts* formed at a node from latent buds. They grow straight up into the plant. Remove these before they become woody to prevent regrowth.



Figure 3.15. The watersprouts above were removed using thinning cuts at the branch collars.



Figure 3.16. This is a heading cut made to reduce size of a rusty blackhaw, *Viburnum rufidulum*. Heading cuts are used to shear plants into hedges and other shapes, particularly topiary. When making a heading cut, be aware that the plant will grow back vigorously from both remaining buds below the cut.



Figure 3.17. Rather than a heading cut, use a thinning cut to remove the terminal at a lateral bud. In oppositely arranged plants, such as this viburnum, rub one bud off with your finger to prevent both buds from developing. Now this branch will grow in the direction of the remaining bud (orange arrow at right).



Figure 3.18. Another option is to use a thinning cut to remove the branch at its point of attachment back in the body of the plant, which can help to hide the cut and still reduces height.



Figure 3.19. How would you prune this *Ligustrum lucidum*, glossy privet, to control its height? Prior to making the first cut, you must know the plant and how it grows.



Figure 3.20. A privet has buds, leaves, and stems that are oppositely arranged (note arrows). You can reduce the height by heading back, which is a typical way to shear privet. You can also cut back to the buds. But because its buds are opposite, you must rub one off unless you want bushier growth.

example, evergreens such as ternstroemia and boxwood are not grown for flowers; they are grown for hedges or screens. Determining when to prune these will depend on their landscape function. Boxwood can be pruned a number of times throughout the growing season, depending on the plant's growth rate, to maintain a hedge or topiary form.

Hollies are typically placed in this category, although not all hollies are evergreen. For example, *Ilex verticillata* (winterberry holly) is deciduous. Although most hollies are not grown for flowers, they are often grown for fruit. Be sure not to remove the flowers to allow fruit to develop later in the year. Remember, many hollies are dioecious (male and female flowers occur on two different plants), so you must include both plants somewhere in the landscape to ensure females will produce fruit. Sometimes you can rely on the plants in someone else's landscape for fertilization of your holly flowers. Hollies are not always picky about the species that contributes the pollen.

Needled evergreen

Needled evergreens have narrow, very thin leaves, some of which are lost each year; these leaves are typically 2 to 3 years old. Most needled evergreens, such as juniper and false cypress, are grown for their foliage. This means pruning is easier. Often it is not needed at all! For example, rug juniper, *Juniperus* spp., is planted for ground cover. If planted correctly in the right location, it will need pruning only to remove dead or broken branches.

Other than thinning and shearing, you need to know how to rejuvenate a plant. We have already covered how to make



Figure 3.21. This is a hornbeam (*Carpinus* sp.); it has an alternate bud/leaf arrangement. Directing growth on alternately arranged plants is somewhat easier because growth will occur in only one possible direction, depending on the bud to which you cut the stem back.



Juniperus procumbens 'Nana', dwarf Japanese garden juniper, can be placed to drape over a wall, as here on Michigan State's campus. Junipers require little pruning, as long as you consider their mature size.

a thinning cut versus a heading-back cut (which is shearing). *Rejuvenation* is simply cutting older wood back to a few inches above the ground. For many plants, you can remove all the stems in one year; for others, it may be best to remove no more than about a third of the entire shrub crown each year. For some plant species, removing only older wood (1 inch in diameter or larger) allows young wood to thrive and produce better flowers. Typically, if the plant is a slow grower, you should prune only a third of the total crown each year. This means it will take maybe three years to get the plant where you want; plus, you (or your customer) may prefer this approach because it is not as severe! Remember, rejuvenation is only meant for fully established plants. For shrubs it may take only three to six months for a plant to become established in a site. For trees and larger shrubs, it may take half a year or a full year per caliper inch of size at planting to establish. For example, if a tree is 2 inches caliper at planting, it will take at least a year for this plant to establish. Establishment success depends on weather, proper planting, species, site conditions, and good after-planting care. Do not rejuvenate newly installed plants. This technique is a valuable tool and you can actually do it on many species, even every year.

When you shear hedges, remember to leave the bottom of the plants a bit wider than the tops. This is so light gets to the lower limbs, keeping them lush and green. Also, you may want to schedule some hand thinning for your hedges every three to five years. Using hand pruners, thin out portions of



Figure 3.22. *Pyrus calleryana* (callery pear) in late summer showing both the developing fruit and the flower buds for next year's bloom. This plant would be pruned after blooming to maintain flower buds for the following year.



Butterfly bush 'Evil Ways' (*Buddleja × davidii*) can be rejuvenated every year, once it is fully established.



Figure 3.23. A yew (*Taxus* sp.) hedge trimmed correctly, with the bottom portion wider than the top. Hand thinning every so often also allows light to get into the body of the plant. The yew in the right picture, located at Longwood Gardens in Pennsylvania, has been pruned for years into this incredible topiary. You can see the brown areas caused by the extensive shearing. These areas may be dead or could possibly be rejuvenated with some long work and years of hand pruning. The catch is, can workers maintain the shape they have created? That depends on their timing and skill.

the canopy of each plant so light gets into the inner areas, allowing foliage to grow here as well. This goes a long way in preventing the thin veneer of leaves that often develops on hedges after being sheared for years.

Specialty Pruning

Aside from shaping plants naturally, you can create other forms using the same pruning techniques we have discussed here, such as shearing and thinning cuts. We will present a few of the most common forms.

Espalier is an ancient horticultural and agricultural practice used to control woody plant growth. Originally, growers used this method to produce fruit in limited space. We, of course, can do the same, as well as create espaliers simply for their unique beauty. To create an espalier, prune branches into a formal shape of your choosing (such as a horizontal branch pattern, “squarish” shape, or fan shape). Typically this is done through thinning cuts. Then either tie the branches to a frame or onto a flat vertical surface of some type, such as a



a fan-shaped espaliered Rose-of-Sharon, *Hibiscus syriacus*, at the Biltmore Estate in Asheville, NC



espaliered rose, *Rosa* spp., at the national Arboretum in Washington, D.C.



pleaching

wall, fence, or trellis. You can even attach branches to a building or allow them to stand free-form.

From late medieval times through the early eighteenth century, *pleaching* was commonly used in gardens and on farms to create shaded paths or living fences out of trees or shrubs. It is not as common today in the landscape, but certainly should be because of its usefulness. This unique technique weaves living and dead branches together to form a living wall or fence. Farmers often used this method on established hedges to strengthen property lines. Often young branches will naturally graft together, strengthening the living structure even further. It requires some pruning to train the branches to grow in the desired directions.

Pollarding uses a heading cut to remove all annual (or biannual) growth back to the same point on a branch (at the collar on the scaffold branches) creating the pollard head. Sprouts will grow from the pollard head, creating lush new growth each year. This technique is much more popular in Europe than here in the United States. Do not confuse this technique with topping, which shortens branches incorrectly to a different point on the branch each year.

A friend of the Roman Emperor Augustus was the first to write a description of *topiary*, indicating that this pruning art dates back to at least 38 BC. Most likely, however, the Romans did not begin the practice. Instead it was absorbed from earlier Mediterranean and Asiatic cultures. No matter where it started, topiary has become a familiar form of garden art. Topiary is the practice of pruning shrubs or trees to create unique shapes or living sculptures. This is typically accomplished with shearing or heading-back cuts

See the other publications in the “Pruning Trees & Shrubs” series to learn more:

Before the Cut (AG-780-02)

Tools to Make the Cut (AG-780-02)

How to Prune Specific Plants (AG-780-04)



A properly pollarded tree growing in Salt Lake City, Utah. You may not like this, but it is one way to control the size of some trees.

This series is a revision of a previous publication:

Powell, M.A. (1998.) *Pruning Trees & Shrubs: A Guide for Grounds Managers* (AG-071). Raleigh: NC State University, NC Cooperative Extension. Available from: <http://www.ces.ncsu.edu/depts/hort/consumer/agpubs/ag-071.pdf>

Important Terms (Know these before making the first cut!)

Here are some basic terms you must know before picking up the pruning tools. (You can find these terms highlighted in italics in the text.)

adventitious growth—Growth that develops from places other than a shoot apical meristem, such as on stems, roots, or leaves. When axillary or lateral buds are destroyed, adventitious buds may develop on stems as secondary growth. These buds often form after wounding such as pruning (often from incorrectly placed cuts), and they may develop on tree trunks due to stress. Those that develop on roots are referred to as suckers.

apical meristem—Located at the tip of a plant shoot or root that produces auxin and causes the shoot or root to increase in length. Growth that originates in the apical meristem is called primary growth.

apical dominance—Natural tendency for the strongest growth to occur on the highest buds (most terminal) on a plant’s stem or branches. Hormones control this growth and suppress the growth of lateral buds and branches lower on the stems.

apical control—Refers generally to the suppression of one elongating branch by a higher more vigorously growing branch; often associated with plant form.

bleeding—The oozing of sap through a pruning or other wound.

branch collar—A swollen ring of bark around the base of a branch and located where the branch is attached to the main trunk or another larger branch.



These incredible topiaries are located in Bishopville, SC, in the small yard of Pearl Fryar. Mr. Fryar has been creating these beauties since 1980. Take some time to visit the Pearl Fryar Topiary Garden for a look at what topiary can create.

branch bark ridge—A layer of bark (mustache-like) located on the upper side of a branch, in the branch crotch.

cambium—A thin area of cells that accounts for growth of girth. The cambium is located beneath the bark.

cane—A generalized term referring to a plant stem. In grapes and brambles, it refers to a stem that made its growth the previous year.

canopy—The total area of the branches of a tree or large shrub (crown).

codominant stems—A stem or branch growing at about the same rate and nearly of the same diameter as another stem or branch; both branches originate from the same union. A codominant stem does not have the same structure as a true branch.

crotch—The angle between two branches or between a branch and the trunk.

crown—Refers to either the area of the main stem that is just underground or the total area of the branches of a tree or large shrub (canopy).

crown thinning—Removing crowded growth from the crown of a tree or shrub to allow more light in and promote healthy growth.

cultivar—A variety of plant that was produced from a natural species and is maintained under cultivation.

deadheading—Removing spent flowers from a plant to make it tidier, promote continued bloom production, or prevent fruit and seed production.

decurrent growth habit—A round-headed and spreading crown that has no main leader.

dieback—The death of tips of shoots or branches, typically spread down the stem, caused by stress, disease, or damage.

elevate (crown raising)—The removal of low branches to produce a taller clear trunk that increases access under the canopy.

epicormic—Shoots that develop from latent or adventitious buds under the bark; often arise close to pruning or other wounds.

espalier—A plant trained through pruning to grow in a formal two-dimensional form.

excurrent growth habit—Occurs when the main stem or leader outgrows and subdues lateral branches; a cone-shaped crown.

girdling—Removing a strip of bark around a branch or main trunk, which can lead to the plant's death.

heading cut—Pruning cut that removes only a portion of a stem, often at an intermodal area (cut made between two buds or nodes).



included bark—Bark developing between two codominant stems, which weakens the union between the branch and trunk and can be a factor in branch failure.

latent bud—Bud that fails to develop in the season it was formed but remains dormant and may later be stimulated into growth. If a branch breaks or is removed just above a latent bud, the bud will likely develop a new shoot to replace the lost wood.

lateral—Bud or branch located along the length of a stem or branch.

leader—A stem that forms the main axis of a woody plant; a plant may have one or many leaders.

node—Point on a stem where a leaf (bud) was or is attached.

phloem—Wood cells that move photosynthates (“food” produced in leaves) throughout plants.

pinching—Nipping out the tip of a growing shoot with your fingers.

pleaching—Informally weaving together tree branches to form a living wall or fence.

pollarding—Heading back all annual (or biannual) growth to the same point on a branch (scaffold branches typically) creating a knobby growth called the pollard head that will sprout again the following year; not to be confused with topping, which removes branches to a different point on the branch each year.

pruning dose—The amount of pruning a plant needs; this will vary based on the age and health of a plant, as well as plant species.

rejuvenation—Involves removing oldest branches by pruning them near the ground. Rejuvenation can be done in stages or all at once, depending on pruning goals; plants should be fully established prior to rejuvenation.

renovation—Revitalizing a plant, often through rejuvenative pruning back to nearly ground level. Renovation can be accomplished in one year or over several years, depending on the species.

scaffold branch—Major branches that will make up the primary crown of a tree.

shearing—Tip pruning without selecting individual laterals or buds (topiary or hedge maintenance).

spur—A stubby flowering branch that grows very little each year and is where fruit is produced on many trees.

sucker—A shoot that arises at or below ground level from a plant’s root or underground stem; on grafted plants, any shoot that arises below the graft union (from the root stock).

taper—A decrease in trunk diameter with height; building taper is important in the development of a strong trunk that will be able to withstand winds.

terminal bud—A bud located at the end of a stem.

thinning cut—Removing branches at the branch collar; typically done to open canopy to air movement and increase light penetration.

tip pruning—Pinching out or cutting back the growing tip of a shoot either to encourage side shoots or to remove damaged growth.

topiary—Practice of pruning a shrub or tree to create a shape or living sculpture; typically accomplished with shearing or heading back cuts.

topping—Heading a large branch or trunk leaving large stubs; removes natural form of plant and can lead to internal decay and extensive sprout development.

U-crotch—Broad branch angle shaped like a “U,” which is less prone to breakage.

V-crotch—Very sharp, narrow branch angle that may be prone to breakage and likely formation of included bark.

watersprout—A vigorous vertical shoot growing from a branch.

xylem—Wood cells that move water and dissolved nutrients through the plant.



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