

shrubs. A general rule is to maintain a two-foot diameter mulched area for each inch of trunk diameter on newly planted trees; for example, a tree with a two-inch diameter trunk would grow best with a four-foot diameter mulched area.

The size of the mulched area can be increased as plant size increases. This mulched area promotes faster tree establishment by eliminating grass root competition for water and nutrients. Additionally, the maintenance of turf areas adjacent to plant trunks is not recommended because it is difficult to trim turf without damaging the trunks. However, other types of groundcovers that are not such strong competitors for water and nutrients can be planted near trees.

Maintenance

Landscape management is an increasingly important, major segment of the environmental horticulture industry in Florida. The scope, complexity and customer demand for near perfection have made the growth of commercial landscape management particularly noteworthy. Nurseries have added landscape maintenance departments, large landscape management companies have emerged, and many small companies as well as thousands of individuals are in the business. Countless condominium units and business complexes have their own maintenance crews. Municipalities, park departments, golf courses and theme parks also employ large numbers of people in landscape maintenance operations.

Landscape management includes not only the management of turf areas, but maintenance of ornamental plants including groundcover plantings, annual and perennial beds, shrubs, trees, and sometimes container plants. Quality management requires trained and dedicated labor, up-to-date techniques properly applied, well-chosen plant materials, as well as carefully maintained tools and equipment that are used appropriately. Good maintenance practices are essential to the appearance and long-term health of landscape plantings.

Professional Landscape Maintenance Checklist

Lawn Care

- ▶ Mow regularly as needed to maintain proper height for the turfgrass species.
- ▶ Edge curbs and planting beds.
- ▶ Blow loose grass clippings, fallen leaves and debris from patios, walkways and driveways.
- ▶ Pick up yard debris and trash.
- ▶ Aerate, dethatch, etc. if needed to maintain turfgrass health.
- ▶ Fertilize as needed.*

Plant Care

- ▶ Prune as needed to maintain size and health.
- ▶ Inspect regularly for pests and diseases.*
- ▶ Deadhead annuals and perennials to remove old, spent blooms and encourage new flower formation.
- ▶ Fertilize as needed.*
- ▶ Manage weeds to maintain an attractive appearance and plant health.*
- ▶ Replace mulch as needed.

Water Management

- ▶ Inspect the irrigation system weekly and adjust run schedules accordingly.
- ▶ Check for leaking pipes and broken sprinkler heads; repair as needed.
- ▶ Make sure sprinkler rotations are on target, not watering sidewalks or roadways.

Safety

- ▶ Inspect sidewalks for cracks.
- ▶ Clear leaves, twigs and other debris from walkways to avoid slipping or tripping hazards.
- ▶ Trim weak or dead branches that could fall and injure people or damage cars and buildings.
- ▶ Clear storm drainage to avoid backup and puddling or flooding potential.
- ▶ Check outdoor lighting and replace bulbs as needed.

* Commercial applications of fertilizer, pesticide or herbicide to landscapes require a license/certificate issued by the Florida Department of Agriculture and Consumer Services (FDACS).

If properly maintained, the landscape should perpetually improve in function, beauty and value. Without proper maintenance, the landscape can change dramatically and rapidly in a negative direction, failing to be either functional or aesthetically pleasing. The effectiveness of any landscape management program is only as good as the expertise of the personnel responsible for day-to-day tasks.

The Florida-Friendly Landscaping™ (FFL) program was created in 2008 to promote the understanding and adoption of research-based, environmentally sound practices in the overall management of Florida landscapes. The FFL program encompasses philosophies of both the Florida Yards & Neighborhoods (FYN) program by UF/IFAS and the Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries (GI-BMP) program by FDEP. The guiding principles provide strategies that support an integrated approach to landscaping with the goal of creating landscapes that are mutually beautiful and environmentally friendly by reducing non-point source pollution from lawn maintenance activities.

Pruning

Pruning is the selective removal of plant parts (typically shoots and branches) to improve health, control growth, or enhance fruiting, flowering and appearance. Basic pruning begins in the nursery, but continued pruning is required in the landscape throughout the life of the plant.

Plants are diverse in their shapes, sizes and habits, but their basic means of survival and growth are generally similar. Remember, leaves produce sugars from sunlight, water and carbon dioxide. Stems support the leaves, expose them to light, and produce new ones. They also transport water and minerals from the roots to the leaves, and foods that have been manufactured in the leaves to other plant parts. Roots supply water and minerals, plus provide anchorage and support. Clearly, there is an interrelationship and balance between all plant parts.

Pruning alters the balance between roots and shoots, and temporarily changes the resulting growth patterns. If part of the branch (stem) system is removed, the excess supplying capacity of the roots results in a vigorous flush of new shoots. Similarly, if roots are pruned, new feeder roots develop, rapidly using the excess food supply from the intact shoot system. Weather conditions may delay this rapid growth pattern. If pruning occurs in winter, the growth flush will be delayed until the weather is warm enough for growth.

Pruning stimulates growth in plant parts near the cuts, but overall, it is a dwarfing process. This is due to the removal of existing plant parts and the reduction of the food or water-supplying capacity of the plant. Removing excessive branches or roots will weaken the plant. Consequently, shoot pruning for the purpose of compensating for some root loss during transplanting is not recommended. In this case, pruning should occur only for removal of dead, diseased, crossed, rubbing, or broken branches. Routine pruning should then begin about one year after transplanting to develop the appropriate form and structure.

Proper plant selection can eliminate much of the pruning requirements in a landscape (Figure 13-28). Unfortunately, plants are frequently placed in the landscape according to their current size and shape, not the size they



Figure 13-28. The large shrubs placed along this narrow driveway require frequent pruning to maintain adequate clearance.

Principles of Florida-Friendly Landscaping™

1) **Right Plant, Right Place**

Match the plant to the site conditions. Well-suited plants need less irrigation and fertilizer and are more resistant to pest infestation. Aim for diversity while avoiding invasive species.

2) **Water Efficiently**

Irrigate only when needed. Efficient watering is the key to a healthy landscape and conservation of limited resources. Overwatering makes plants prone to pest problems and contributes to non-point source pollution. Group plants with similar water needs, and zone irrigation systems appropriately.

3) **Fertilize Appropriately**

Overuse of fertilizers can be hazardous to the landscape and the environment. Fertilize according to recommended rates and application times to prevent leaching. Look for fertilizers with slow-release nitrogen and little or no phosphorus. Never fertilize within 10 feet of any waterbody (or three feet with a spreader guard, unless prohibited by local fertilizer ordinances, homeowner association or community restrictions), and never fertilize before heavy rain. Sweep up any fertilizer spilled on the lawn, sidewalk or driveway and put it back in the bag.

4) **Mulch**

Maintain a three-inch layer of mulch to retain soil moisture, prevent erosion, suppress weeds, reduce the need for herbicide applications, ease maintenance, and provide a neat appearance. Always leave at least two inches of space around tree trunks to prevent rot. Create self-mulching areas under trees by letting fallen leaves lie. Be sure to choose sustainably harvested mulch like melaleuca, pine straw, or eucalyptus.

5) **Attract Wildlife**

Use plants that provide food, water and shelter to attract and foster Florida's diverse wildlife. Select plants with seeds, fruit, foliage, flowers or berries that animals can eat. Supply water in rain gardens, bird baths or fountains. Increase vertical and horizontal layering of plantings to provide habitat. Many animals contribute to landscape stability by eating pests and pollinating plants.

6) **Manage Yard Pests Responsibly**

Unwise use of pesticides can harm people, pets, beneficial organisms and the environment. Prevent disease and insect outbreaks by selecting pest-resistant plants and placing them in suitable locations. Pick insects off by hand, or spot treat only (rather than blanket spraying) and use selective, low toxicity controls rather than broad spectrum insecticides. Always follow pesticide label instructions.

7) **Recycle Yard Waste**

Decomposed organic matter, like pruned branches or grass clippings, releases nutrients back to the soil in a form that plants can easily use. Returning composted materials to the soil improves structure, increases water holding capacity, increases fertility, and results in less yard trash going to the landfill.

8) **Reduce Stormwater Runoff**

Fertilizers and pesticides can leach through the soil or run off into storm drains. Along with landscape debris and eroded soil, these substances can wreak havoc on water quality and fragile ecosystems. Retain and use as much rainfall and irrigation water that falls on landscapes as possible by creating shallow rain gardens, or shaping the earth on slopes with berms (rises) and swales (dips) to help slow runoff from heavy rains and allow water time to soak into the ground.

9) **Protect the Waterfront**

Waterfront property and surrounding watersheds (drainage areas) should be carefully protected to maintain freshwater and marine ecosystems. Homeowners are encouraged to protect any waterbody by creating a 10-foot maintenance free zone around it (three feet is acceptable with a guard if following the GI-BMP program and not otherwise prohibited by local or homeowner restrictions). Do not mow, fertilize, or use pesticides in this zone. Do not let grass clippings or pet waste get into the water, as these carry nutrients and harmful bacteria.

Information summarized from UF/IFAS resources.

are likely to attain in five or more years. The homeowner or landscape manager soon finds it necessary to clip or prune plants frequently to keep them within bounds. For instance, frequent pruning is assured when sweet viburnum shrubs are selected as foundation plants, because this plant can quickly grow to 25 feet tall. Using a low growing juniper, dwarf pittosporum or other compact shrub in such a location would greatly reduce or eliminate required pruning.

If a plant needs to be pruned several times each year to control size, it may be the wrong species for that location. Many pruning tasks can be eliminated by proper plant selection; this can also save space in landfills by reducing the volume of yard waste. It is less time consuming and less costly to select and install the right sized plant than to choose one that will require frequent, timely pruning.

Reasons to Prune

Proper pruning enhances the beauty of almost any landscape plant, while improper pruning can ruin or greatly reduce its landscape potential. Plants may be pruned for a number of reasons. The reason pruning is needed must be determined before beginning the process.



Figure 13-29. Young tree pruned to develop branch structure.

Maintain or Improve Vigor

Removal of dead, dying, or damaged wood and diseased or insect-infested plant parts is an effective way to stop the spread of decay, disease, and insects to other portions of the plant or to neighboring plants. For example, if several branch tips are infested with aphids or scale, prune and discard the affected shoots. This can be an effective alternative to spraying insecticides if the infestation is small and localized.

Control Plant Size and Form

A common objective of pruning is to maintain or develop a desired size or form. To accomplish this goal, pruning should be a routine part of landscape maintenance and not delayed until the plant is overgrown. An unkempt plant can be tall as well as leggy with little foliage close to the ground. Having such characteristics makes it impossible to prune a plant to the desired size in a single pruning without severely damaging it. Consequently, the plant must be pruned back gradually over a period of several years.

Selective pruning of shoots can be used to shape plants or produce either a thin or thick canopy. A thinner canopy will allow more light penetration and help keep interior leaves on the plant. **Root pruning** can be used to slow plant growth, producing a more compact plant. When this technique is used, prune one-half of the root system, wait four to six weeks, then prune the other half. Root pruning should be scheduled when roots will be watered thoroughly in order to keep the soil moist for four to six weeks following each root pruning activity.

Training Young Plants

Pruning young trees can dramatically influence their long-term health, function and survival. Early pruning on young shrubs encourages branching and fullness, characteristics that are frequently desirable in landscape plants.

Branch spacing and arrangement (Figure 13-29), along with the ultimate structural strength and safety of a tree, can be controlled by selectively removing branches from a young sapling. When performing this task, always work with the natural form of a plant. Encourage only one central trunk to develop by removing competing, upright trunks or branches. This process should begin within the first two to three years after the tree is propagated. Tree training continues for 10 or more years on large maturing species. Frequent, light pruning done several times each year encourages faster growth and prevents undesirable sprouting when compared to one heavy pruning each year. Do not attempt to dramatically alter the natural tree form in all but the most intensely maintained landscapes; instead, choose a species that has more of a natural tendency to grow into the desired shape and size. For example, a river birch, red maple, or trumpet tree would be better suited as a shade tree in a narrow vertical space than would a live oak.



Figure 13-30. An example of a topiary boxwood shrub.

Create Desired Shapes

Plants can be pruned into different shapes, such as balls, squares, rectangles, or animal figures, to create special effects. Plants pruned in this manner (known as **topiary**) become focal points and should be used sparingly in most landscapes (Figure 13-30). Small-leaved plants with dense foliage (such as holly, boxwood, rosemary, yews, and some juniper) are the best choice for topiaries because they can be more easily trained into a specific form. Another technique uses a wire mesh frame packed tightly with sphagnum moss. Appropriate plant species, including begonias, English ivy, and creeping fig, can be planted in the sphagnum, forming a fully grown topiary in several months to two years.

The practice of growing plants against a wall (**espalier**) requires frequent pinching and pruning (Figure 13-31). Plants trained in this manner are used as specimen plants. Not all plants are adaptable to this pruning technique,



Figure 13-31. An example of an espaliered pyracantha shrub.

but sea grape, fatshedera, magnolia, yaupon holly, podocarpus, and loquat make excellent espalier plants.

Many plants considered to be large shrubs, such as ligustrum, wax myrtle and pittosporum, can be trained into small trees by gradually removing (over a period of one to three years) all the foliage and small branches from the lower portion of one or more stems. This should not start before the plants are about eight feet tall, so the main trunks can develop properly. Small branches left along the lower trunk will build the trunk caliper and create a sturdier tree. The longer they remain on the trunk, the thicker and stronger the trunk becomes.



Figure 13-32. Oleander shrubs bloom on new vegetative growth. Pruning just prior to the new season's growth promotes lateral branching with increased flower bud formation.

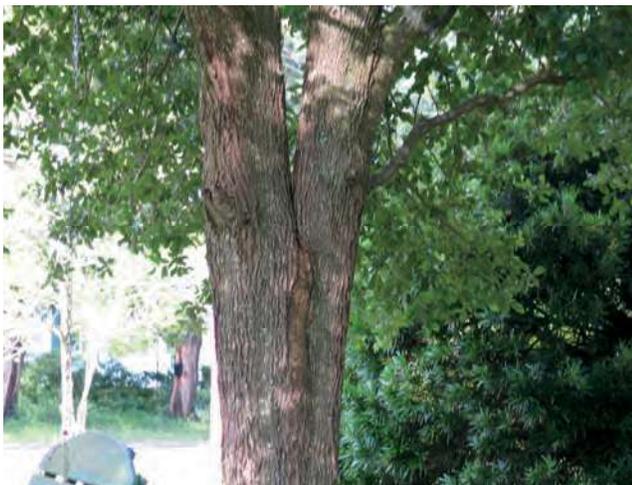


Figure 13-33. Branches with narrow V-shaped angles produce a wedge of included bark that prevents strong branch attachment; it often breaks at this point.

Enhance Flower and Fruit Production

Larger fruit can be produced by selectively removing flowers or developing fruits; energy will be directed to those remaining, and they will become larger. Light pruning helps to maintain annual flowering and fruiting on fruit trees. Severe pruning on plants that flower in the current season's growth, such as oleander and plumbago, will generally stimulate vegetative growth and produce fewer but larger flower clusters (Figure 13-32). However, this practice should not be completed at the expense of the natural plant shape, as is too commonly seen on crape myrtles. In species that flower terminally (such as azalea, cassia, or oleander), pinching new vegetative growth during the growing season will stimulate growth of lateral shoots and increase the number of flowers produced. Additionally, removal of developing seed heads on crape myrtle will promote a second, and perhaps third, flower display.

Promote Safety

The manner in which stems are attached to each other and to the trunk influences the structural strength of a tree. Branches with embedded (or included) bark having narrow V-shaped crotches (Figure 13-33) are weak and should be removed in favor of wider-angled, strong U-shaped crotches (Figure 13-34). Large, decayed, broken, or poorly attached tree limbs



Figure 13-34. Trees with strong, U-shaped branch unions are much stronger and better able to withstand storms without breakage.

should be promptly removed by a professional before they fall. Dead branches and branch stubs should also be removed as they can lead to serious trunk decay. Periodic tree inspection by a professionally trained tree specialist (**arborist**) can help prevent these situations from becoming unsafe conditions.

When to Prune

Trees and shrubs can be lightly pruned anytime. However, some plants have specific pruning periods (Figure 13-35) that allow them to perform at their maximum potential.

Spring Flowering Plants

To minimize reduction of next year's flowers, prune spring flowering plants such as azaleas (Figure 13-36), spireas, and redbuds in late spring before the flower buds set for the next season. Spring flowering plants set their

flower buds on the previous season's growth, and buds overwinter on this older wood. For example, azaleas form flower buds in July for the following year's flower display; pruning them between the end of the flower display and late spring or early summer will not reduce the number of flower buds set. Pinching new shoots on azaleas anytime from several weeks after they begin elongating through May will encourage lateral branching. Each of these laterals is likely to develop a flower bud. Thus, a pinched plant produces many more flowers the following year than does an unpinched plant. Pruning azaleas between July and the flower display will remove flower buds and reduce the flower display but should not affect the health of the plant.



Figure 13-36. Azalea blooms are located on last year's growth or one-year-old wood. This makes it important to wait for pruning until after the blooms have occurred. If pruned too late, the plant will not have time to set flower buds on the new growth before fall begins. A good rule of thumb is to prune before the month of July.

Winter and Spring Flowering Plants

(flowers produced on previous season's growth)

Shrubs	Trees
azaleas	fringe tree
camellia	Hong Kong orchid
French hydrangea	Japanese magnolia
Indian hawthorn	purple trumpet tree
spireas	redbud

prune after flowering
but before new flower buds form

Summer Flowering Plants

(flowers produced on current season's growth)

Shrubs	Trees
abelia	bottlebrush
allamanda	cassia
bougainvillea	crape myrtle
hibiscus	frangipani
oleander	jacaranda
plumbago	princess flower
rose	royal poinciana

prune during the dormant season

Summer Flowering Plants

Plants that produce flowers in the current season's growth, such as abelia, hibiscus, and rose, are usually pruned while dormant or just before the spring growth flush. Developing shoots can be pinched to encourage lateral branching, which will enhance the flower display. Moderate to severe pruning may encourage the production of fewer but larger flowers or flower clusters.

Figure 13-35. Pruning period for common flowering plants.

Deciduous and Evergreen Trees

It is best to prune trees, such as oaks, maples, hickory, and other large shade trees, late in the dormant season or several weeks following a growth flush. Pruning at other times frequently promotes undesirable sprouting. Trees sprout excessively and are easily damaged when pruned during active shoot elongation. The worst times to prune are when leaves are forming. Above all, trees should never be pruned while under stress.

Terminal growth of pines can be controlled by removing one-half of the new shoot (called “candles” in pines) in the spring just prior to needle expansion (Figure 13-37). This encourages new bud formation at the pinch, slows growth on the pinched branch, and creates a more compact plant. Never pinch a pine at other times of the year, since new buds will not form.

Some trees such as birch, maple, elm, and walnut bleed sap from wounds if they are pruned during late winter or early spring. This **bleeding** is not usually harmful to the tree, but the dripping sap is often objectionable (Figure 13-38). Trees that show this tendency should be pruned in late fall or early winter.



Figure 13-37. Pinch the ends of candles on pines to encourage dense new growth.

Evergreen Shrubs

Most evergreens, such as podocarpus, holly, boxwood, ligustrum, juniper, and wax myrtle, can be pruned anytime. To encourage rapid shoot development and the greatest overall plant growth, prune just prior to bud swell in the spring. To retard growth for maximum dwarfing effect, prune just after each growth flush, when leaves have fully expanded. Late summer pruning may stimulate an additional flush of shoot growth on species that flush several times each year. These new shoots could be damaged by an early frost.

Pruning Wounds

Closure (**callusing**) of pruning wounds on most trees and shrubs should be most rapid if pruning is conducted just before or immediately following the spring growth flush. This is desirable because a closed wound is more aesthetically pleasing, plus insects, diseases, and decay organisms are discouraged from entering the plant. In addition, cold injury can be reduced if pruning is conducted close to spring bud break. Late fall and early winter pruning can stimulate new growth, particularly when a mild period occurs during the winter. These immature, succulent stems are not cold hardy and can be easily damaged,



Figure 13-38. Bleeding from pruning cuts can be unsightly but is usually not harmful and will naturally heal over time.

even by a light frost. Low winter temperatures can also cause cambium damage beneath improperly executed pruning cuts, even if growth is not stimulated by pruning. This is particularly true of plants that are marginally hardy. If in doubt about cold susceptibility, it is best to delay heavy pruning until just before growth begins in the spring.

Research has shown that pruning wound dressings do not prevent decay. When exposed to the sun, the protective coating often cracks, allowing moisture to enter and accumulate in pockets between the wood and the wound covering. This situation may be more inviting for wood-rotting organisms than one with no wound cover. In situations where aesthetics are important, the practice may be justified.

Pruning Tools

Using the right equipment is just as important as understanding and following pruning guidelines. Always choose high-quality tools that will accomplish the job, maintain a sharp edge, and that are reasonably simple to handle and sharpen. Plant material can be easily cut using sharp instruments without causing damage to the surrounding tissues. Tissues injured by dull tools are prone to disease and decay, which may lead the plant to long-term health problems.

The basic tools (Figure 13-39) used in pruning are hand pruners, loppers, hedge

shears, and saws. **Hand pruners** are used for small branches and twig cleanup. Most of them are designed for cutting stems up to $\frac{1}{2}$ inch in diameter. Attempting to cut larger branches risks making a poor cut and/or ruining the shears. Two common styles of hand shears are the scissor action (bypass) and the anvil cut. In bypass shears, a thin, sharp blade slides closely past a thicker but also sharp blade. Bypass shears usually cost more but make cleaner, closer cuts. In anvil-cut shears, a sharpened blade cuts against a broad, flat blade. Anvil blades are more likely to crush plant tissues when attempting a cut if not kept sharp.

Lopping shears (loppers) have long handles that are operated by both hands with cutting blades like hand pruners. Loppers can easily cut branches up to one and a half ($1\frac{1}{2}$) inches in diameter and some are capable of cutting larger materials.

Pruning saws, either rigid or folding, are very useful for cutting larger branches that are too large for hand shears or loppers. Pruning saws have teeth that are designed to cut on the pull stroke. The teeth in these saws are set for a wider cut, which allows the sawdust to kick out and results in less green wood binding. Bow saws work best in areas where no obstructions exist for a foot or more above the area to be cut.

Pole pruners usually have a cutter with one hooked blade above and a cutting blade beneath, similar to a large pair of lopping shears (Figure 13-40). The cutter is on a pole and is operated by pulling a rope downward. Poles can be made of various materials and can either be in sections that fit together or that telescope. Wooden poles are sturdy but heavy, while aluminum poles are light but can conduct electricity if they touch an overhead electrical wire. Fiberglass or some type of plastic compound is probably the best pole material. Poles can also be fitted with saws, but



Figure 13-39. Sampling of common hand pruning tools by Felco.

photo source: corona and stihl



Figure 13-40. Pole pruners with saw, manual hedge shears (Corona), and power driven hedge shears (Stihl).

these are usually very frustrating to use. The use of pole pruners can be dangerous. Material that is cut overhead can fall on the operator. The user should exercise caution and wear head and eye protection, and avoid pruning near overhead electrical wires.

Hedge shears are used mainly for shearing plants into hedges or formal shapes. Manually operated shears can be used for small jobs; however, power-driven shears are more practical in larger areas (Figure 13-40).

Gas powered and electrical **chain saws** are best suited for removing trees and cutting firewood but can also be used to prune live plant material. However, only professional arborists should use chain saws for pruning trees because of safety concerns.

Care of Tools

Properly cared for, tools do a better job and last longer. Use tools for the task they were designed to complete. Do not twist or strain pruners or loppers. Keep the branch to be cut as deeply in the jaws and near the pivot point as possible. Never cut wires with pruning tools because permanent damage to the metal blades can occur.

When pruning diseased plants, **disinfect** all shears and saw blades after each cut to prevent spreading disease to healthy plants. Pruning shears and saws can be dipped in a weak alcohol solution (one part alcohol to nine parts water) to prevent the spread of disease between plants.

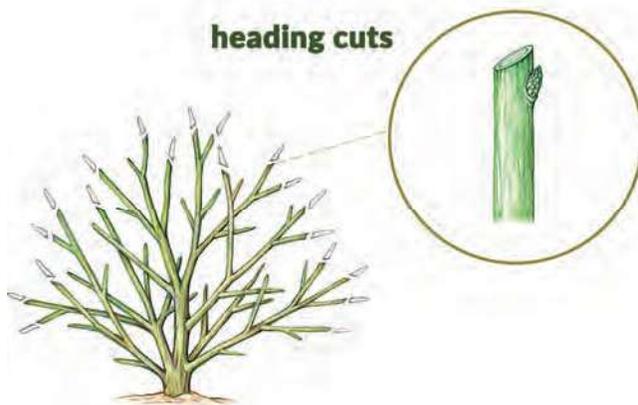
At the end of the day, oil the blades and other metal surfaces well to avoid rusting. Keep the cutting edges sharp; several passes with a good oil stone will usually suffice (Figure 13-41). Paint, varnish, or regularly treat wooden handles with linseed oil.



Figure 13-41. Maintaining a sharp edge on bypass pruner blades.

Pruning Techniques

Heading back (Figure 13-42) is selective cutting of the terminal ends of twigs or young branches back to an axillary bud or node. When heading back trees or shrubs, make the cut on a slight slant about $\frac{1}{4}$ inch above a healthy bud (Figure 13-43). In nearly all plants, active growth of the terminal bud suppresses the growth of the buds below. Removing the terminal bud of a shoot or branch releases more than one of the lower buds to begin development and thus increases branching and fullness. Usually, the buds closest to the cut develop and inhibit the growth of buds below them. Because the uppermost bud will probably be the most vigorous, the direction toward which it points will be the direction of the new growth. For that reason, new growth can be aimed in a preferred direction by pruning back to selected buds.



graphic source: this old house

Figure 13-42. Heading cuts remove shoots no more than 2 years old back to a bud, cuts an older stem back to a lateral branch less than $\frac{1}{3}$ the diameter of the cut stem, or cuts a stem to an indiscriminate length.

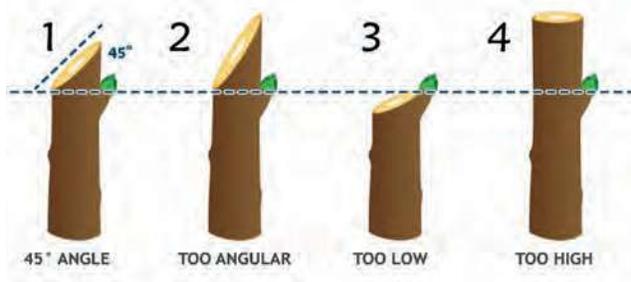


Figure 13-43. Proper pruning technique requires branches to be cut just above a bud (#1). Cutting the branch at too sharp an angle (#2), too close to the bud (#3), or too high above the bud (#4) are common mistakes.

New foliage that develops after heading back may be so thick that it shades the lower growth, forming a top-heavy plant. This can be avoided in shrubs by heading back shoots to several different heights (Figure 13-44). In some plants, notably many of the conifers, lateral buds on older wood lose the ability to resume active growth, and cutting these plants back to only old wood will result in the death of the limb or tree if it is the main trunk.

If the pruning cut is made too far above a healthy bud, regrowth will not occur below the cut, and a stub will develop (Figure 13-45). The stub will die because there are no leaves to supply food and maintain water conduction. The dead stubs then offer entry for wood-rotting fungi and wood-eating insects, as well as make the plant unsightly. This is one way trees become hazards because the decay spreads, creating a hollow, unstable tree.



photo by the plant addict

Figure 13-44. Heading back azalea shoots to different heights.

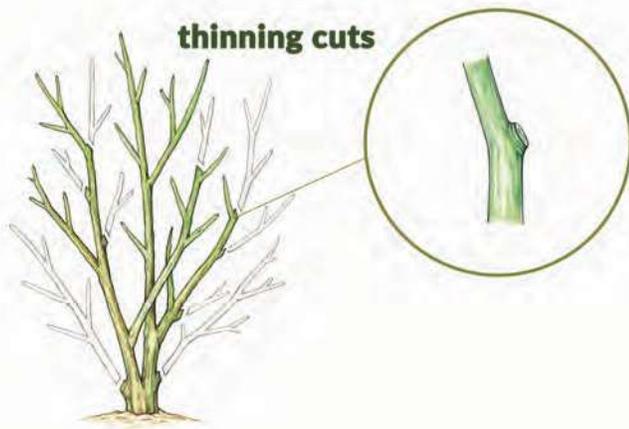


photo by i saček sr, creative commons license

Figure 13-45. Leaving stubs from pruning cuts may provide an entrance for wood decay organisms.

Thinning (Figure 13-46) is the complete removal of branches back to the next lateral branch or the main trunk; or, in some shrubs, older branches can be cut to the ground. Thinning gives a plant an open appearance and can encourage new growth inside the crown, depending on how the plant is thinned. If thinning is heavy, interior sprouts will develop. If the plant is lightly thinned, interior shoots are not likely to develop. This technique is used primarily on shrubs to control size while maintaining a natural appearance; it contrasts with hedging or heading back to the same spot on all branches, which gives a shrub a manicured, controlled appearance.

Trees can be thinned to increase light penetration and encourage turf growth beneath the tree. Trees with properly thinned crowns also resist wind damage better than unpruned trees. This is a specialized technique best done by a professional arborist.



graphic source: this old house

Figure 13-46. Thinning, also known as selective cutting or drop-crotching, involves complete removal of a branch back to the main stem, to another lateral branch, or to the point of origin.

Pruning Shrubs

The first step in pruning a shrub is to remove all dead, diseased, or injured branches. Remove branches that cross or touch each other and those that look out of place. If the shrub is still too dense or large, remove some of the oldest branches. Head back excessively long branches to a bud or lateral branch that is six to 12 inches below the desirable plant height.

If the shrub is two to three feet taller than desired, both heading and thinning may be desirable. Do not use hedge shears; cut each branch separately to different lengths with hand pruners. This will maintain a neat informal shrub with a natural shape. Plants sheared into various geometric shapes produce a formality not suitable for many modern, natural landscapes.

A properly pruned shrub is a work of art and beauty and does not look as if it has been pruned. Pruning cuts should not be visible but should be located inside the plant, covered up by remaining foliage (Figure 13-47).



photo by gale allbritton

Figure 13-47. Only minor heading back of longer shoots with pruning cuts made inside the foliage is needed to maintain the natural form of this *Camellia sasanqua*.

Hedge Pruning

The method of pruning hedges depends on the type of hedge desired. Informal hedges generally consist of a row of closely planted shrubs that are allowed to develop into their natural shape. Annual pruning consists of thinning and heading back just enough to maintain the desired height and width.

Formal or clipped hedges require specialized pruning, which may become a continuous job during the growing season. The desired appearance of a formal hedge is a soft outline of foliage from the top of the hedge to the ground.

graphic by ms state extension

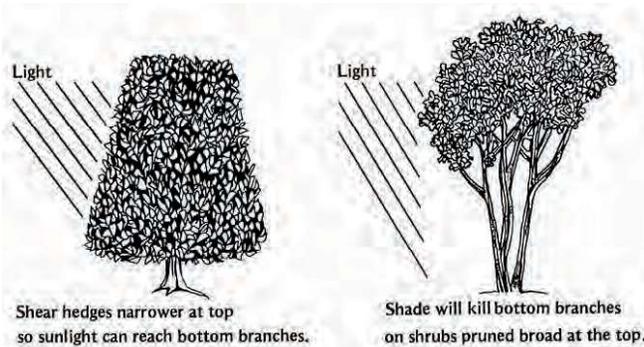


Figure 13-48. Correct form of a sheared hedge is slightly wider at the bottom to allow light penetration and to maintain fullness.

There are two important factors to remember when pruning formal hedges: 1) hedges should be clipped while new growth is green and succulent; and 2) plants should be trimmed so the base of the hedge is wider than the top (Figure 13-48). Hedges pruned with a narrow base will lose lower leaves and branches because of insufficient light. This condition will worsen with age, resulting in sparse growth at ground level and an unattractive hedge that does not provide the desired privacy.

Flowering hedges grown formally should be sheared after they have bloomed, as more frequent shearing reduces the number of flowers. If the flowers are of secondary importance, pruning may be conducted at any time.

Rejuvenation of Shrubs

Rejuvenation is a drastic method of pruning old shrubs that have become much too large or have a large amount of nonflowering wood. On single-stem shrubs, such as ligustrum and gardenia, rejuvenation is carried out over a period of two to three years by severe thinning out to the basic limb framework. In this case, $\frac{1}{3}$ to $\frac{1}{2}$ of the old growth is removed each year.

Multiple stem shrubs are rejuvenated by cutting back all stems at ground level over a period of three years. Remove $\frac{1}{3}$ of the old, mature stems in the first year. The second year, remove $\frac{1}{2}$ of the remaining old stems and head back long shoots growing from the previous year's pruning cuts (Figure 13-49). Remove the remaining old wood and head back the long new shoots in the third season.

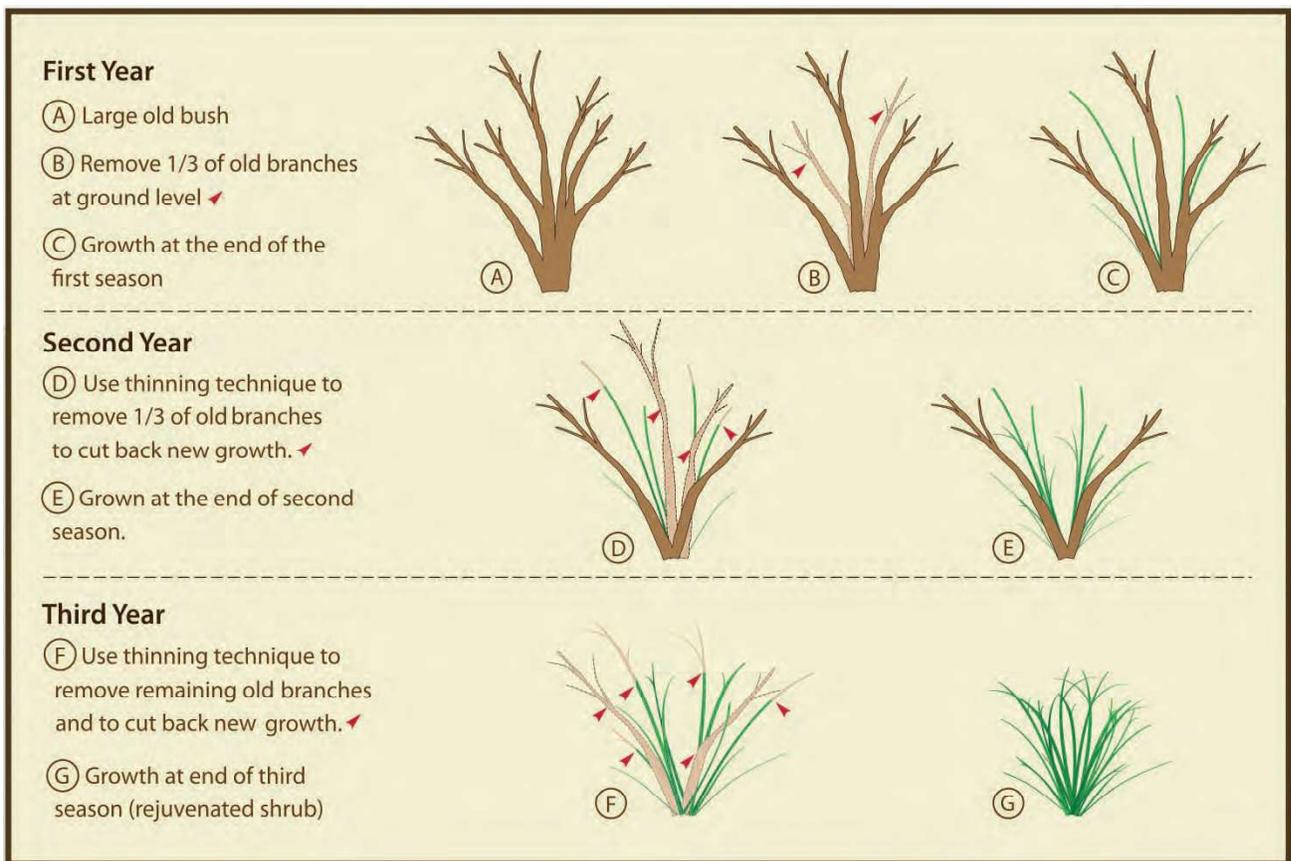


Figure 13-49. Severe pruning is taken in steps over three years to rejuvenate old, overgrown landscape shrubs.

graphic by morris arboretum, university of pennsylvania

The best time for rejuvenation is in late winter or early spring, just before new growth begins. Large, old shrubs should not be rejuvenated during late summer, as new growth will be stimulated and possibly killed by cold weather in the winter.

Pruning cane type shrubs (such as mahonia) is best done on a two or three-year cycle. The tallest canes are pruned to a stub three inches to six inches above the soil line during the first spring, just as growth begins. By the second spring, last year's medium-sized canes have grown to become tall canes and should be cut back to a three-inch stub. Canes from the first year's pruning will have already begun to grow and should be about one to three feet tall. In the third spring, the canes that were the shortest in the first spring should now be fairly tall and can be cut back. In this way, there is always foliage near the ground and the shrubs can be kept from becoming leggy.

Pruning Trees

The characteristic form of a tree should be known before any live branches are removed. In most landscape settings, little or no attempt should be made to significantly change the characteristic growth habit common to the species. First, prune out dead, diseased, or

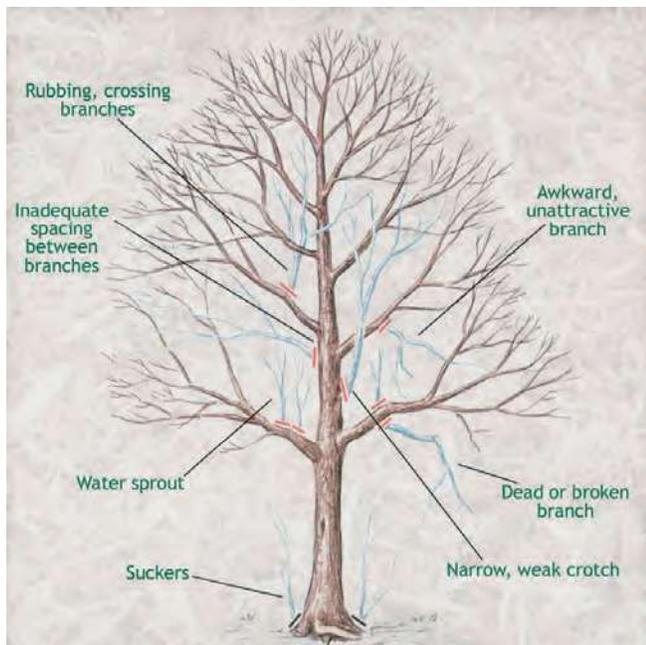


photo by the garden glove

Figure 13-50. Pruning techniques for trees.

broken twigs and branches. After studying the tree form (Figure 13-50), select the best spaced and positioned permanent branches, then remove or shorten others. Permanent branches should be spaced between six inches and 24 inches apart on the trunk, depending on the ultimate mature size of the tree. For smaller trees such as redbud, a six-inch spacing is adequate; whereas, for larger trees such as oaks, an 18-inch to 24-inch spacing is best. Next, remove fast-growing suckers at the base of, and along, tree trunks, or those found on large, interior limbs.

Young trees should be pruned to a **single leader** (stem) after locating the straightest and best leader to retain. Most trees can be grown in this form when they are young, but the growth habit of some species will change to a multileader, spreading form as they mature.

There should not be any narrow forks or branches leaving the trunk at an acute angle. Crotches of 45 to 90 degrees from the vertical are less likely to split than narrow "V-shaped" crotches of less than 40 degrees. Branches with a narrow angle of attachment should be removed as soon as possible. Any such branches that are 1/3 the diameter of the trunk or larger should be removed at once all the way back to the trunk.

When training a young tree, prune the lower branches back to about eight inches from the trunk, but do not remove them



photo by joanbanjo, creative commons license

Figure 13-51. Hat-racking is stressful to trees and may result in reduced vigor, decline, structural failure, or even death.

entirely. By keeping the lower, smaller diameter branches on the trunk, the tree will grow faster, develop a thicker trunk, and the trunk will be better protected from sun burn and vandalism. Removing the lower branches too soon will result in a poorer quality plant. When the tree approaches two to three inches in diameter, remove temporary lower branches, beginning with the largest diameter branches. Lower branches that are larger than $\frac{1}{4}$ inch in diameter should be removed immediately.

Heading back (**stubbing**) trees is rarely warranted in landscape sites. If it is necessary, for example, to prune beneath power lines or to clear a tree from interfering with a structure, always head back to a fork where there is a live branch. Within several months, prune out all sprouts growing in response to the pruning cut. Never **hat-rack** a landscape tree (Figure 13-51); that is, cut all branches back to about the same length without regard for their location. This type of pruning has no place in horticulture and is not recommended.

Removing Large Tree Branches

Large branches too heavy to be held by hand (those $1\frac{1}{2}$ inches or larger in diameter) require three separate cuts to prevent trunk bark stripping (Figure 13-52). The first cut is made on the lower side of the branch about 15 inches away from the trunk and as far up through the branch as possible before the branch weight binds the saw. The second cut

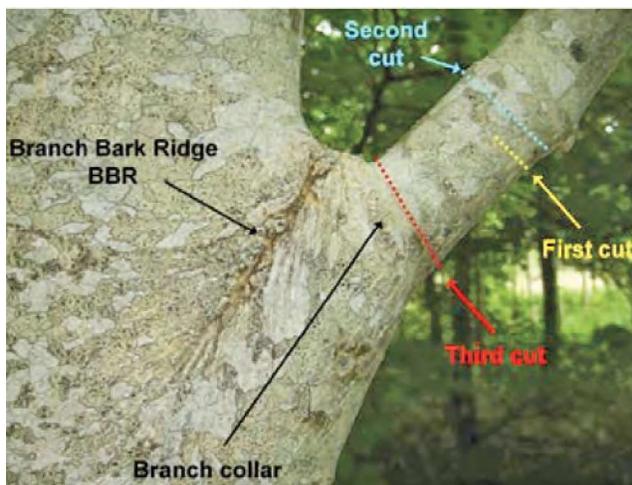


Figure 13-52. The three-cut method of removing large limbs.

is made downward from the top of the branch about 18 inches from the main trunk to cause the limb to split cleanly between the two cuts without tearing the bark. The remaining stub is easily supported with one hand while it is cut from the tree. The final cut should begin on the outside of the **branch bark ridge** and end just outside the **branch collar** swelling on the lower side of the branch. The accuracy of this last cut is usually achieved by cutting at a right angle to the branch bark ridge (Figure 13-53). Flush cuts should never be made since they injure the trunk and delay healing. Research has conclusively shown that close cutting causes extensive decay because wood is cut that is part of the trunk.

When large branches are cut, it is not always possible to make the cut to a distinct bud, because the bark may obscure the dormant (**latent**) buds. In such cases, numerous latent buds may begin to grow very rapidly, producing excessively vigorous shoots called watersprouts (Figure 13-54). These **watersprouts** should be thinned out, leaving the more desirable and properly located ones to become branches.



Figure 13-53. Properly healed pruning wound.



Figure 13-54. Watersprouts growing vertically from an older limb.

Pruning Palms

A properly fertilized and pruned palm should have a round canopy with green leaves right down to the bottom (Figure 13-55), but not all palms require pruning. Palms with **crownshafts** (a region of smooth, usually green, tightly clasping leaf bases at the top of the gray trunk) should never need pruning if properly fertilized (Figure 13-56). In these palms, a healthy old leaf will be completely green one day, completely orange-brown the second day, and completely brown the third day, when it should fall off by itself. This is natural **senescence** (aging). Half-dead old leaves that remain on the palm for months at a time are usually deficient in potassium (K); instead of pruning, the plant should be fertilized to prevent this problem.

Old leaves (fronds) in palms without crownshafts deteriorate with age, similar to those with crownshafts, but dead leaves may have to be cut off manually. Dead fronds usually drop downward and hang against the trunk when they die, whereas potassium deficient leaves usually remain in their normal position within the canopy.

When to Prune

Since palm pruning is done primarily for aesthetic purposes, there is no one time of the year that is better than another. Ideally, a dead leaf is pruned whenever it appears on a palm, but commercially, palms are pruned on a fixed schedule (yearly, semiannually, etc.) or whenever the palm's appearance becomes unacceptable to the owner. Pruning dead leaves prior to hurricane season may reduce the chances that these easily detached leaves will become missiles in a storm.

What to Prune

Several palm species retain their leaves (**fronds**) after they have turned brown. Other species look bedraggled when certain nutrient deficiencies appear in the older leaves. Old leaves that persist on palms, such as Washington palms (Figure 13-57), should be removed as they often harbor insects and rodents, may become a fire hazard, or simply are not aesthetically pleasing. However, palms naturally translocate nutrients to younger foliage from the browning fronds, and frond removal can deprive the tree of needed



Figure 13-55. Example of properly fertilized and pruned palms.



Figure 13-56. Palms with a crownshaft are considered self-cleaning and only need minor attention if properly fertilized.



Figure 13-57. The dead fronds of *Washingtonia robusta* hang close to the trunk in a thatch. The dry leaves are a fire hazard and provide a home for undesirable creatures.

nutrients. Cutting deficient leaves off rather than treating the problem with adequate fertilization will only lead to the return of deficiency symptoms. Removal of completely dead leaves or flower and fruit stalks from palms is never a problem.

Palms, such as royal palms, shed their heavy leaves; so remove them before they drop if they are growing where falling leaves may be hazardous. The large fruits of coconut palms can be dangerous to pedestrians and automobiles passing beneath the palm (Figure 13-58). Prevent the formation of fruits by removing flower stalks, but flower stalks on Christmas palms and others can be left on the plant to take advantage of the ornamental characteristics of the fruit that develops.

How to Remove Leaves

Care must be taken when pruning palms not to cut or otherwise injure the **terminal bud**, or the whole tree will die (Figure 13-59). Leaves should be cut close to the trunk and from the underside to avoid tearing the fibers of the palm's stem. Never cut into the trunk with a machete, as this can result in wounds that have been shown to allow lethal diseases to become established. Finally, never use climbing spikes for pruning palm leaves, because wounds



Figure 13-58. Dead fronds and coconuts being removed before having a chance to fall on pedestrians and automobiles below.



photo by billy deal

Figure 13-59. Palms have a single growing point at the top of its trunk called the terminal bud. If injured, the palm may die.

caused by the spikes will never heal and can become entry sites for diseases or attractants for serious insect pests.

Overpruning

If palms are overpruned, the reduction in canopy size results in reduced photosynthetic capacity. If this practice is repeated frequently, the palm may also develop a smaller trunk diameter. Overpruned palms often fare more poorly in cold weather events than those with fuller canopies. The additional leaves or leaf bases left on the palm can provide insulation to the bud or meristem. Following cold weather events, it is recommended that cold-damaged leaves not be pruned off until after the threat of additional cold weather has passed.

Palms are also sometimes overpruned prior to hurricane season. "Hurricane-cut" palms have most of their leaves cut off, leaving only a tuft of the youngest leaves intact (Figure 13-60). This method is intended to reduce wind resistance in the palm, thereby protecting it from wind



photo by sally scalera

Figure 13-60. An overpruned cabbage palm (*Sabal palmetto*) that is now subject to being snapped off in high wind.

damage. However, in severe hurricane seasons, these palms are more likely to have their crowns snapped off than those with fuller crowns, possibly because the youngest remaining leaves were not hardened off to the extent that older leaves were and lack the support of the older leaf bases. Repeated hurricane pruning produces a narrowed trunk just below the fronds, a phenomenon known as "pencil top." This weakens the palm and may cause premature death of the tree. To avoid problems associated with overpruning, remove only dead leaves, and do not remove fronds that are held above a horizontal angle, sometimes called the 9 o'clock to 3 o'clock rule (Figure 13-61).



photo by tia silvassy, uf ifas extension

Figure 13-61. Guidelines to avoid overpruning palms.

Seasonal Cultural Practices

Annuals must be planted two to three times per year to maintain the continuous vigor and color demanded in public areas. Although perennials and foliage plants are considered long-lived and relatively low maintenance plants compared to annuals, they also require maintenance, such as dividing or thinning, and occasional replacement to eliminate unsightly plants.

Winter temperatures in many parts of the state are often not low enough to completely kill tender flowering and tropical plants. While many of these plants may perform as perennials and grow outdoors for several years in mild climates, they should be treated as annuals and replaced periodically with new, vigorous, disease-free and insect-free plants. This will eliminate tall, unattractive plants and prevent the buildup of pathogens and insects.

It is worth noting that the addition of seasonal color to the landscape will increase maintenance tenfold compared to turf (Figure 13-62). Infertile sandy soils, insects, and heavy rains often necessitate repeated applications of fungicides for disease control, insecticides for insect control, and fertilizer to maintain adequate nutritional levels. Additionally, annual and perennial plants must have faded flowers removed to extend the blooming period, a practice known as **deadheading** (Figure 13-63).

Annual plants should be allowed to dry slightly between watering to encourage flower



Figure 13-62. A combination of annuals and perennials incorporated into the landscape setting.

production. This will also reduce the overall plant height, discourage fungus from developing, and reduce excessive fertilizer release. Morning watering is strongly recommended.

Disposal of Landscape Material

Lawn and landscape maintenance involves the removal of leaves, clippings, pruned branches, and even whole plants. Careless disposal may spread invasive plants to areas where they do not belong. It may also spread insects and diseases.

Depending on the situation and local ordinances, several options are available to dispose of plant material. Living plant tissue can be destroyed onsite through burning, composting in bins, or putting it in or under heavy plastic. Material may also be dumped in designated disposal areas.

Summary

Consideration of the growing needs of plants, the site characteristics, and the needs of the user should always guide the selection and siting of plants. The necessity for pruning and other maintenance activities can be reduced by selecting the proper plant for the location. Understanding and applying practices that support the development of a sustainable landscape results in a healthier, long-lived, low maintenance, and less costly landscape that is functional, attractive, and enjoyable for the user.



Figure 13-63. Faded flowers must be deadheaded to maintain attractive appearances and encourage continued bloom.