

LANDSCAPE AND TURF MANAGEMENT

Lesson 15: PRUNING

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PowerPoint Slide 2: Title Slide / Lesson 15 - Pruning

In nature, every plant eventually is pruned in some manner. It may be a simple matter of low branches on forest trees being shaded by higher ones until they wither and die and are removed in a storm. Or it could be that tender new branches of small plants are accidentally knocked off by wild animals looking for food. In the long run, a plant growing naturally will take the shape that is best for its location and climate.

In a garden you can help things along by pruning. Your reason may be to get a better shape or size or more and bigger flowers or fruit. Whatever your intent, pruning should usually be done in such a way that the plant looks as if it were growing naturally. Some exceptions include hedges, topiary plants, and espaliers, which are trained flat against a wall or support.

QUESTION: Have any of you ever done pruning? If so, were you pruning shrubs, or trees? Did you enjoy the work? Did you see an improvement in the plant after you pruned it?

STUDENT RESPONSE: *(For about 2 minutes, students can highlight their prior experience in pruning.)*

PowerPoint Slide 3: Overview (text)

Definition of Pruning

Reasons for Pruning

When to Prune (timing)

Pruning Tools

Rules of Pruning

Apical Dominance

Pruning Techniques

This section on pruning will acquaint you with the basic reasons for pruning trees and shrubs. Also the more accepted methods of pruning will be outlined. This information will aid you in selecting the proper pruning tools and equipment and help you understand the WHY-WHEN-WHERE-HOW of pruning.

PowerPoint Slide 4: Definition of Pruning (text)

Pruning - A horticultural practice involving the removal of portions of a plant to control growth, form and size, correct structural defects, improve health, vigor and structure, and enhance flowering and fruiting

Pruning is defined as “a horticultural practice involving the removal of portions of a plant to control growth, form and size, correct structural defects, improve health, vigor and structure, and enhance flowering and fruiting.” A simpler definition is “the removing of parts of plants for a purpose.” Even lawn mowing may be considered a form of pruning because it is the removal of a part of the plant (blades of grass) for a purpose (height/size control and a neat manicured appearance). Different plants require a different approach to pruning. Some may benefit from heavy pruning every few years or perhaps even every year, whereas others require very little, and some never require pruning unless they are injured or damaged. Much needless pruning could be eliminated through proper selection of plants to start with.

PowerPoint Slide 5-8: Reasons for Pruning (text)

1. Young trees are pruned to encourage proper development and natural form and to create a well-spaced, sturdy set of scaffold branches, these branches are the basis for a strong and well-structured crown
2. Older trees are pruned to maintain their natural form and vigor
3. To repair damage
4. To direct or control growth
5. To encourage flowering and fruit production and to improve fruit quality
6. To create specialized or unique forms
7. To promote compact, well-branched, transplantable root systems
8. To remove spent flowers (deadheading)

Reasons for Pruning

There are eight basic reasons for pruning:

1. **PRUNING TO ENCOURAGE PROPER DEVELOPMENT AND NATURAL FORM AND TO CREATE A WELL-SPACED, STURDY SET OF SCAFFOLD BRANCHES (young trees)**
Whether young or old, it is generally best to maintain the natural form of the plant; after all, each plant has a unique form that should be maintained rather than pruning all plants to have the same form. Getting young plants off to a good start by establishing a set of well-spaced scaffold branches that are strong (wide crotch angles as opposed too narrow crotch angles which are weak); water sprouts (young, vigorous, upright shoots that form in unwanted locations on trunks and branches), suckers (young, vigorous shoots that form

from roots), rubbing/crossing branches, diseased branches, and broken branches should also be removed.

2. **PRUNING TO MAINTAIN NATURAL FORM AND VIGOR (older trees and plants in general)**
In general, plants should be pruned to maintain their natural form; this means the person doing the pruning needs to understand the growth and natural form of the plant being pruned; trees generally require little pruning, but dead, diseased, rubbing, broken branches should be removed.
3. **PRUNING TO REPAIR DAMAGE**
If a storm breaks a limb, you should cut the stub back to another branch or to the trunk. Dead branches should be removed as soon as you see them. Usually death is due to shading or crowding, however, it may be due to disease, and prompt removal can prevent the infection from spreading to healthy wood. Make such cuts back into live healthy wood. Also, dip disinfectant can be made from a mixture of 1 part household bleach (such as Clorox) and 9 parts water.
4. **PRUNING TO DIRECT OR CONTROL GROWTH.**
Anytime the end (terminal) bud is removed from a branch or stem, terminal growth is stopped and lateral growth is encouraged from side buds. When side branches are removed, the growth of the central leader is hastened. With removal of the tip of the leader and of the main branches, lateral growth of the secondary branches is encouraged, resulting in a more compact plant. In other words, pruning allows one to shape and train plant as desired. This includes pruning to reveal the attractive branches of normally leafy plants, hedge shearing, espaliering, and even lawn mowing. Using only the thumb and forefinger (or a pair of pruning shears), one can deliberately nip out buds to stop growth in that region and force it in another place.
5. **PRUNING TO ENCOURAGE FLOWERING AND FRUIT PRODUCTION.**
One of the first gardening discoveries made by human beings was that by pruning in certain ways they could grow better flowers or fruits. Plants that can be induced to produce better flowers or fruits by proper pruning include Roses, Chrysanthemum, Grapes, Peaches, Apples, etc.
6. **TO CREATE SPECIALIZED OR UNIQUE FORMS**
Although we generally want to maintain the natural form of most plants, sometimes the objective is to create specialized or unique forms as in topiary (plants pruned into geometric, animal, or other shapes), espalier (training and pruning plants to grow in two dimensions), and bonsai (dwarfing plants by growing them in small containers and pruning to produce a specific form).

7. TO CREATE COMPACT, WELL-BRANCHED, TRANSPLANTABLE ROOT SYSTEMS (root pruning during production)

One of the primary objectives of nursery growers is the production of a compact, fibrous root system that transplants readily and improves the likelihood of survival for newly planted plants; this goal is achieved by repeated root pruning during production.

8. TO REMOVE DEAD/FADED FLOWERS (deadheading)

Some plants drop their dead/faded naturally and some do not; for those that do not, removing dead flowers improves a plant's appearance; removing spent flowers can also sometimes promote repeated bloom and continued and enhanced flowering for some annuals; flowers should not be removed where fruit production is the goal.

TOPPING OF OLDER TREES TO REDUCE SIZE AND WIND RESISTANCE IS NEVER AN ACCEPTABLE PRACTICE

PowerPoint Slide 9: When to Prune (text)

Late Winter (dormant season)

Spring

Summer

Fall

When to Prune

Some kind of pruning is necessary for most plants just before or at the beginning of the growing season. Major pruning on deciduous plants like fruit trees and roses is usually done in late winter when branches are bare. Some flowering shrubs need to be pruned just after they bloom. But you can also clean up, pinch back or shear many plants in summer and fall - in fact, you have to if you want to keep a plant a certain size or shape.

When a shrub is grown for its flowers, pruning must be timed to minimize disruption of flowering. Timing is species and cultivar specific.

PowerPoint Slide 10: Prune in Spring (text)

Some shrubs bloom in early spring on old wood flower from buds produced on last season's growth). Pruning these plants during the winter or early spring removes flower buds and reduces bloom. Prune these plants just after they flower; this allows for vigorous growth during the summer to provide flower buds for the following year.

Plants that bloom in early spring on old wood (last season's growth):

(Prune just after flowering)

- *Amelanchier* spp. Serviceberries/Juneberries
- *Forsythia* spp. Forsythias
- *Lonicera* spp. Honeysuckles
- *Magnolia* spp. Magnolias
- *Prunus* spp. Cherries, Plums, Apricots, etc.
- *Rhododendron* spp. Azaleas and Rhododendrons
- *Ribes* spp. Currants, Gooseberries
- *Spiraea* spp. Spring blooming Spireas (white)
- *Syringa* spp. Lilacs

PowerPoint Slide 11: Prune in Late Winter or Spring (text)

Plants that bloom in late spring or early summer (late June or later) may bloom from buds produced the previous year (old wood) or during the current year (new growth). Prune plants that bloom from buds produced on last year's growth before growth starts in the spring or just after flowering.

Plants that bloom in late spring/early summer on old wood (last season's growth):

(Prune before growth starts in the spring or just after flowering)

- *Philadelphus* spp. Mockoranges
- *Potentilla* spp. Shrubby Cinquefoil
- *Rosa* spp. Some Shrub Roses
- *Viburnum* spp. Viburnums
- *Weigela* spp. Weigelas

PowerPoint Slide 12: Prune in Late Winter or Early Spring (text)

Prune plants that bloom from buds that are produced on new growth produced that year (current season's growth) in late winter or early spring before growth starts to promote vigorous shoot growth in the spring.

Plants that bloom on new wood (current season's growth):

(Prune before growth starts in the spring)

- *Clematis* spp. Clematises
- *Clethra alnifolia* Summerweet
- *Hydrangea* spp. Hydrangeas
- *Rosa* spp. Some Shrub Roses
- *Spiraea* spp. Summer Blooming Spireas (pink)

PowerPoint Slide 17: Pruning Tools (text)

Hand Pruners (bypass/scissors type)
Lopping shears (bypass/scissors type)
Pole Pruners
Hedge Shears
Pruning Saws
Chain Saws

Pruning Tools

Hand pruners are good for branches up to one-half inch in diameter. Attempting to cut larger branches risks making a poor cut and/or ruining the shears. The scissor action by-pass pruning shear's cutting action is produced by a thin sharp blade sliding closely past a thicker but also sharpened blade. The resulting cut is clean, close and professional.

Lopping shears have long handles and are operated with both hands. Even the cheapest can cut one-half inch diameter material. The better ones can slice through branches of 1 ½ inches or more, depending on species and condition (e.g., pin oak is tougher than linden and dead wood is tougher than live wood).

Pole pruners have a cutter with one hooked blade above and a cutting blade beneath. The cutter is on a pole and is operated by a lanyard rope pulled downward. The poles can either be in sections that fit together or telescoping and can be made of several materials. Wooden poles are heavy. Aluminum poles are light but can conduct electricity if they touch an overhead wire. Fiberglass, or some type of plastic compound is probably the best answer. Poles can also be fitted with saws.

Use of pole pruners can be dangerous, as material cut overhead can fall on the operator (unless it hangs up in other branches). The user should exercise caution and wear head and eye protection.

Manual hedge shears have long, flat blades and relatively short handles, one for each hand. Heavy-duty shears with one blade serrated are good for difficult jobs. Power hedge shears are also available in both electric and gas powered models.

There are many makes and models of hand pruning saws. Cutting edge is measured in points (teeth per inch). An 8-point saw is for delicate, close work on small shrubs and trees. Average saws are about 5 ½ to 6 points, while 4 ½-point saws are for fairly heavy limbs. Blades can be either straight or curved. Many prefer a curved blade that cuts on the draw stroke. A double-edged saw has fine teeth on one side, coarse on the other. These are difficult to use in densely branched plants. Bow saws are good only where no obstruction exists for a foot or more above the area to be cut.

Chain saws come in a variety of sizes. The smallest, lightest saws (sometimes referred to as “climbing saws”) can be used for removal of large branches and small trees.

PowerPoint Slide 18-20: Pruning Techniques (text)

1. Know the plant (identify the plant and understand its growth habits and natural form) and prune accordingly based on the pruning objectives.
2. Have a plan – know your pruning objectives and have a reason for every pruning cut; pruning cuts are wounds and shouldn’t be made without good reason; pruning cuts also can’t be undone and have a lasting effect which can be positive or negative.
3. Use the proper tool in the correct manner; pruning tools should be clean, sharp (precise cuts heal more quickly than rough cuts) and in good working condition.
4. Keep pruning cuts (wounds) small by pruning sooner rather than later.
5. Never leave stubs, but avoid flush cuts.
6. Do not cut into the branch collar (but, again, don’t leave stubs).
7. With a few exceptions, the best time to prune is during the dormant season; late winter/early spring just before growth begins (March/April).
8. As a general rule, no more than one third of the living crown should be removed each year.

PowerPoint Slide 21-25: Apical Dominance (diagram)

Pinching Produces New Buds

Each branch tip of a plant produces a growth hormone called auxin. This hormone causes the tip bud to produce new tissue, drawing nourishment and water from the plant through the cambium layer just under the bark. Another name for the tip bud is the apical bud; the branch will display apical dominance. If the tip is removed, . . .

PowerPoint Slide 23: Apical Dominance (diagram)

. . . dormant buds all along the branch may begin to produce auxin. When you pinch off branch tips, you signal the plant to produce new branches. Pinching doesn’t change the direction of plant growth-it just increases the number of stems and buds. To change the direction of a branch, . . .

PowerPoint Slide 24: Apical Dominance (diagram)

. . . you must find a bud growing in the direction you want the branch to grow. You then snip off the whole branch . . .

PowerPoint Slide 25: Apical Dominance (diagram)

. . . just above that bud. The bud will then take over.

Time Check: PowerPoint half-way mark.

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You should be about 20 minutes into the lesson, or 15 minutes into this presentation.

PowerPoint Slide 26: Pruning Techniques (text)

- Heading Back Small Branches
- Removing Large Branches
- Thinning
- Gradual Renewal
- Rejuvenation Pruning
- Evergreen Trees & Shrubs
- Hedges
- Root Pruning
- Deadheading

The number one rule in pruning is to never make cuts at an arbitrary point along a branch. Instead, cut just above a bud or a good branch, or make the cut nearly flush with the trunk or base, trying to make the wound fairly small so bark will cover it quickly. If you cut between two buds leaving a stub, no nourishment will pass through the tissue below the cut. The stub above the bud will wither and die, offering a breeding ground for disease organisms that can damage the whole branch.

PowerPoint Slide 27-28: Heading Back Small Branches (diagram)

When pruning twigs and small branches, always cut back to a vigorous bud or an intersecting branch. When cutting back to a bud, choose a bud that is pointing in the direction you wish the new growth to take. Be sure not to leave a stub over the bud or cut too close to the bud.

PowerPoint Slide 29: Heading Back Small Branches (diagram)

When cutting back to an intersecting (lateral) branch, choose a branch that forms an angle of no more than 45 degrees with the branch to be removed. Also, the branch that you cut back to should have a diameter of at least one-third that of the parent branch.

Make slanting cuts when removing limbs that grow upward; this prevents water from collecting in the cut and expedites healing.

PowerPoint Slide 30: Removing Large Branches (diagram)

According to Dr. Alex Shigo, plant pathologist, USDA Forest Service, thick, heavy branches should be removed . . .

PowerPoint Slide 31: Removing Large Branches (diagram)

. . . flush to the collar at the base of the branch, not flush with the trunk.

The collar is an area of tissue that contains a chemically protective zone. In the natural decay of a dead branch, when the decay advancing downward meets the internal protected zone, an area of very strong wood meets an area of very weak wood. The branch then falls away at this point leaving a small zone of decayed wood within the collar. The decay is walled off in the collar. This is the natural shedding process when all goes according to nature's plan. When the collar is removed, the protective zone is removed, causing a serious trunk wound. Wood-decay fungi can then easily infect the trunk. If the pruned branch is living, removal of the collar at the base still causes injury.

PowerPoint Slide 32: Removing Large Branches (diagram)

When removing large branches over 1.5" in diameter, it is best to make three saw cuts. If a single saw cut is made there is danger that the weight of the branch will cause the branch to break before it is completely sawed off, resulting in a strip of bark being peeled off. (*continues*)

PowerPoint Slide 33: Removing Large Branches (diagram)

First saw an undercut from the bottom of the branch about six to twelve inches out from the trunk and about 1/3 of the way through the branch. (*continues*)

PowerPoint Slide 34: Removing Large Branches (diagram)

Next, make a second cut from the top, about three inches further out from the undercut, until the branch falls away. (*continues*)

PowerPoint Slide 35: Removing Large Branches (diagram)

The resulting stub can then be cut back to the collar of the branch (do not cut into the branch collar). If there is danger of the branch damaging other limbs below or objects on the ground, it must be properly roped and supported, then carefully lowered to the ground after the second cut.

PowerPoint Slide 36: Deciduous Shrubs (diagram)

The pruning recommended for most deciduous shrubs consists of thinning and gradual renewal. In thinning out, a branch or twig . . .

PowerPoint Slide 37: Deciduous Shrubs (diagram)

. . . is cut off at its point of origin from the parent stem, to a lateral side branch, to the “Y” of a branch junction, or at ground level. This method of pruning results in a more open plant and does not stimulate excessive new growth. Considerable growth can be cut off without changing the plant’s natural appearance or habit of growth. (*continues*)

PowerPoint Slide 38: Deciduous Shrubs (diagram)

In gradual renewal pruning, a few of the . . .

PowerPoint Slide 39-40: Deciduous Shrubs (diagram)

. . . oldest and tallest branches are removed at or slightly above ground level on an annual basis. Some thinning out pruning may be necessary to shorten long branches or maintain a symmetrical shape.

Cutting the entire plant to the ground is called rejuvenation and can be used on vigorous plants that sucker from the base; flowering and fruiting will not occur for several years

PowerPoint Slide 41: Evergreen Trees and Shrubs (diagram)

Pruning Evergreen Trees

The main objective in pruning evergreens is to produce a bushier, compact plant. Pruning new growth at the ends of twigs and branches forces the plant to make additional new growth. Many evergreens will not produce buds if cut back to three or four-year-old growth. Not all evergreens however, can be pruned at the same time or in the same manner.

Pines, firs, and spruces make only one growth during a year. Most other evergreens, such as arborvitae, juniper, yew and hemlock continue to develop during the growing season.

Cutting back the tops of overgrown evergreens causes different results with different plants. Yew, hemlock and arborvitae will produce growth from dormant buds on old wood. Japanese false-cypress and junipers, spruce, pine and firs are not likely to regenerate new growth.

PowerPoint Slide 42: Hedges (diagram)

Hedges consist of plants set in a row so as to merge into a solid linear mass. They have served gardeners for centuries as screens, fences, walls and edgings.

A well-shaped hedge is no accident. It must be trained from young trees to induce low branching, and can take three or more years.

Hedges are often shaped with flat tops and vertical sides. This unnatural shaping is seldom successful. The best shape, as far as the plant is concerned, is a natural form, rounded or slightly pointed top with sides slanting to a wide base.

Rounded or peaked tops aid in the shedding of snow, which if left, may break branches. Before shaping, some thought should be given to the shape of the untrimmed plant. For example, naturally conical arborvitae does particularly well in a Gothic arch shape. Common buckthorn, a spreading plant, is more easily shaped to a Roman arch.

PowerPoint Slide 43: Review (text)

- Definition of Pruning
- Reasons for Pruning
- When to Prune (timing)
- Pruning Tools
- Rules of Pruning
- Apical Dominance
- Pruning Techniques

In this lesson we've learned why, when, and how to prune trees and shrubs.

QUESTION: Can anyone give me a reason to prune?

STUDENT RESPONSE: *(Students provide all 7 answers; then show slide 45)*

PowerPoint Slide 44: Definition of Pruning (text)

Pruning is a horticultural practice involving the removal of portions of a plant to control growth, form and size, correct structural defects, improve health, vigor and structure, and enhance flowering and fruiting

PowerPoint Slide 45: Reasons for Pruning (text)

1. To encourage proper development, natural form, and vigor
2. To repair damage
3. To direct or control growth
4. To encourage flowering and fruit production, improve fruit quality
5. To create specialized or unique forms (e.g., topiary, espalier, bonsai)
6. To create compact, well-branched, transplantable root systems
7. To remove dead/faded flowers (deadheading)

PowerPoint Slide 46: When to Prune – Timing (text)

Late Winter (dormant season)

Spring

Summer

Fall

QUESTION: As each season arrives, what pruning tasks do we need to follow?

STUDENT RESPONSE: *(Students provide all 4 answers; then show slide 48)*

PowerPoint Slide 47: When to Prune (text)

- Late winter/early spring (before new growth begins) – prune shrubs that bloom on current season’s growth; shrubs grown primarily for their foliage; most trees
- Spring (just after flowering) – prune shrubs that bloom on last season’s growth
- Summer – pruning limited; minor pruning (e.g., removing dead wood and broken branches); trees that “bleed” sap in early spring if pruned in winter
- Fall – pruning limited; minor pruning (e.g., removing dead and broken branches)

QUESTION: What pruning tools are useful?

STUDENT RESPONSE: *(Students provide all 6 answers; then show slide 49)*

PowerPoint Slide 48: Pruning Tools (text)

Hand pruning shears

Lopping shears

Pole pruners

Hedge shears

Pruning saws

Chain saws

QUESTION: What are the basic rules of pruning?

STUDENT RESPONSE: *(Students provide answers; then show slide 50)*

PowerPoint Slide 49: Rules of Pruning (text)

1. Know the plant (identify the plant and understand its growth habits and natural form) and prune accordingly based on the pruning objectives.
2. Have a plan – know your pruning objectives and have a reason for every pruning cut; pruning cuts are wounds and shouldn’t be made without good reason; pruning cuts can’t be undone and have a lasting effect which can be positive or negative.
3. Use the proper tool in the correct manner; pruning tools should be clean, sharp (precise cuts heal more quickly than rough cuts), and in good working condition.
4. Keep pruning cuts (wounds); prune sooner rather than later.
5. Never leave stubs, but avoid flush cuts.
6. Do not cut into the branch collar (but, again, don’t leave stubs).
7. With a few exceptions, the best time to prune is during the dormant season; late winter/early spring just before growth begins (March/April).
8. As a general rule, no more than one third of the living crown should be removed each year.

QUESTION: Which pruning techniques would you like to try in your yard?

STUDENT RESPONSE: *(Students provide answers; then show slide 51)*

PowerPoint Slide 50: Pruning Techniques (text)

- Pinching – pinching stems back to increase plant density (mainly herbaceous plants)
- Removing Side Branches – cut back to an outward pointing/growing bud or side branch; cut branches just outside the branch collar, not flush with the trunk
- Thinning – removing individual branches to make plants more open (trees and shrubs)
- Heading Back – shortening branches by cutting back to an outward pointing bud (mainly shrubs)
- Gradual Renewal – removing up to 1/3 of the largest stems to near the ground to renew from the base (mainly shrubs)
- Rejuvenation – cutting a plant to the ground to completely rejuvenate the plant (mainly shrubs)
- Hedges – choose between natural form or sheared; shearing is higher maintenance
- Root Pruning – used during production to create a branched, compact, transplantable root system
- Deadheading – removing dead flowers to improve appearance and promote continued bloom

PowerPoint Slide 51: Closing

One of the most important tasks in the garden is pruning. When you practice your pruning skills you will enjoy numerous payoffs, such as plant health, safety under large trees, and the beauty of an improved form or increased flowers.

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