

OAKLAND CUSD #5

# LANDSCAPING

APRIL 27-MAY 1, 2020

JEFF COON

# Week of April 27-May 2, 2020

All of these assignments are on google classroom. You must pick one of the 3 listed and complete by next Monday, May 4th for credit. If you would like to use google docs to complete the work that would be most efficient, just remember to start a new copy with your own work please. Paper copies can be returned to the school.

<b>Class</b>	<b>Choice 1</b>	<b>Choice 2</b>	<b>Choice 3</b>
Ag Science	CDE	Animal Reproduction #2	FFA Journal
Ag Business Mang	Advertising	Borrowing Money	car Insurance
BSAA	Animal Health	Respiration	Domestic Animals
Landscape Design	Managing grasses	Landscape areas	Landscape Power tools
Intro To Ag	CDE	Consumer Trends	Maintaining your SAE
Ag Mech.	Land measurement	coolants	Remote sensing

Checking Your Knowledge:

1. What are the recommended fertilizer practices for lawns?

2. What are the guidelines for mowing turfgrass?

3. What are the recommended irrigation practices for turfgrass?

4. What are soil compaction and thatch buildup?

5. What can be done to alleviate soil compaction and thatch buildup?

# Managing Turfgrass

**Y**OU DON'T HAVE TO BE formally trained in turfgrass management to maintain turfgrass. In fact, millions of people across the country maintain their own lawns. However, if you want optimal turf growth or if you are in the turfgrass industry, applying recommended practices is necessary. This unit discusses those practices.



## Objective:



Describe maintenance practices for turfgrass.

## Key Terms:



core cultivator

evaporation

evapotranspiration

fertilizer analysis

fertilizers

inorganic fertilizers

irrigation

micronutrients

mowing

organic fertilizers

power rake

primary macronutrients

reel mower

rotary mower

secondary

macronutrients

soil compaction

thatch

topdressing

transpiration

## Turfgrass Maintenance

Most of the time devoted to turfgrass maintenance is spent with a few major practices. They are fertilizing the turfgrass, mowing the turfgrass, irrigating the turfgrass, and addressing soil compaction and thatch buildup.

## FERTILIZATION

Turfgrasses, like all other plants, need nutrients to grow. Most of the nutrients are obtained from the soil. For optimal growth, providing additional nutrients is necessary.

### Essential Nutrients

It is generally believed that there are 16 essential nutrient elements needed by plants. A shortage of any of these elements will cause a plant to have a nutrient deficiency.

Three of the 16 essential nutrient elements are carbon (C), oxygen (O), and hydrogen (H). They are viewed as nonfertilizer elements because plants obtain them from the air and from water. Plants obtain the other 13 elements, considered fertilizer elements, from the soil.

Three of the 13 fertilizer elements are called primary macronutrients. They are used in greater quantities than the other nutrients. **Primary macronutrients** are nitrogen (N), phosphorus (P), and potassium (K).

Another three elements required in fairly large quantities are called **secondary macronutrients**. They are calcium (Ca), magnesium (Mg), and sulfur (S).

The last 7 of the 16 essential elements are called **micronutrients**. Micronutrients are iron (Fe), zinc (Zn), copper (Cu), manganese (Mn), molybdenum (Mo), boron (B), and chlorine (Cl).

### Fertilizers

**Fertilizers** are materials that contain one or more essential nutrients for plant growth. They can be applied to the turfgrass in granular or liquid form. **Inorganic fertilizers** are fertilizers made of inorganic salts. The nutrients in inorganic fertilizers are made available to plants quickly. **Organic fertilizers** are made from natural organic materials, such as animal manure, dead plant and animal matter, sewage sludge, bone meal, and blood meal, or from synthetic organic materials, such as urea, sulfur-coated urea, and other urea-containing materials. With the exception of urea, organic fertilizers release nutrients slowly.

A fertilizer can be purchased with specific amounts of nutrients. The **fertilizer analysis** gives the percentages of nutrients by weight. For example, a 27-8-12 fertilizer contains 27 percent nitrogen, 8 percent phosphorus as  $P_2O_5$ , and 12 percent potassium as  $K_2O$ .

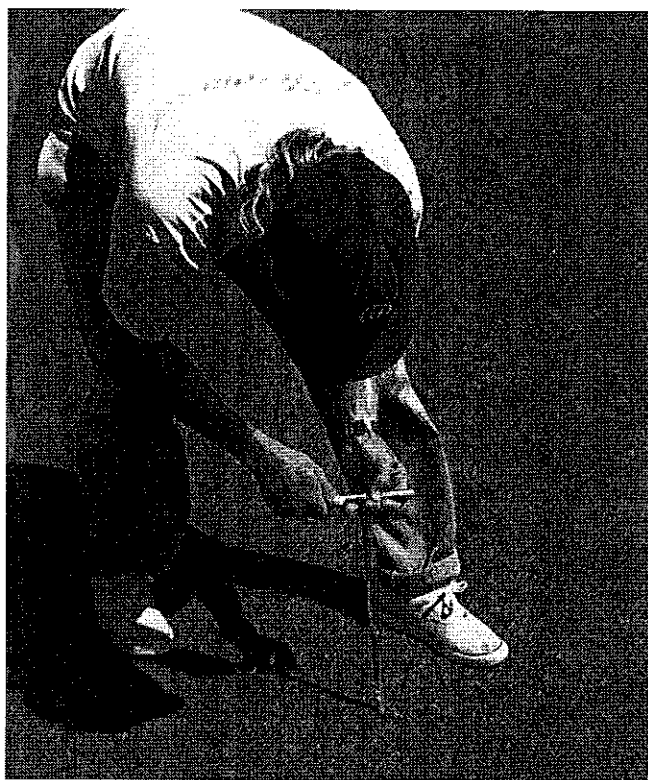


FIGURE 1. Using a soil probe to obtain a soil sample.

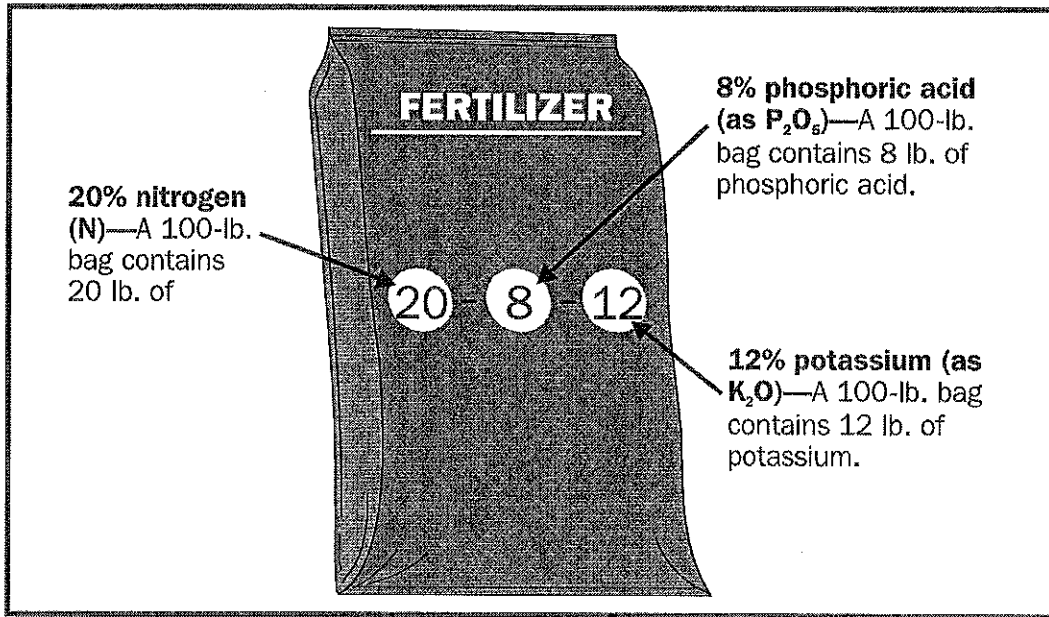


FIGURE 2. The numbers on a fertilizer bag indicate the percentages of nutrients by weight.

### Fertilizer Application

Nitrogen is the nutrient needed in greatest quantity by turfgrass plants. The recommended rate of application for a home lawn is normally 1 pound of nitrogen per 1,000 square feet two or three times a year. Applying more than 1 pound of nitrogen per 1,000 square feet at a single application is counter-productive. Turfgrass cannot use a greater amount of nitrogen in a short period. Also, excessive fertilization can cause damage to the environment by nutrient-leaching and runoff losses.

Fertilizers are best applied when turfgrass is actively growing. For cool-season turfgrass lawns, that is during spring and fall. For warm-season turfgrass lawns, it is during spring and summer.

A fertilizer spreader is used to distribute fertilizer evenly across a lawn. Be sure to calibrate the spreader properly to deliver the desired amount.

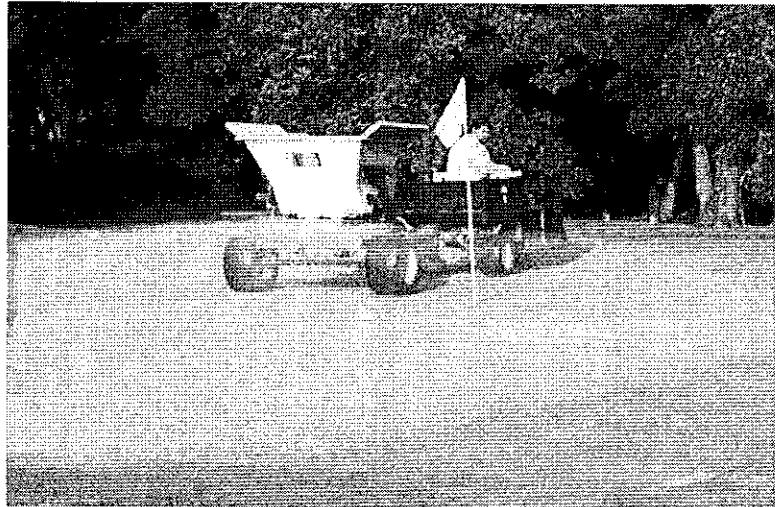


FIGURE 3. Large rotary fertilizer spreader being used on a golf course.

## MOWING

Lawns are mowed for aesthetic purposes. A neatly mowed lawn is attractive. **Mowing**, or cutting grass, also reduces problems with some weeds and prevents turfgrasses from forming seed heads.

### *Mowing and Turfgrass Physiology*

Some physiological things take place with the mowing of turfgrass. Mowing removes the grass leaves, which make food for turfgrass growth and development. A close-cut lawn has less leaf surface area for producing food. As a result, root systems tend to be smaller, and the turfgrass is more susceptible to stress-related diseases. Mowing also inhibits the reproductive cycle of a turfgrass. Turfgrass that is not mowed will normally produce seed heads. Frequent mowing interferes with the process of seed head–stem elongation and seed development. Consequently, the turfgrass continues to grow vegetatively.

### *Mowing Recommendations*

Mow turfgrass so that no more than one-third of the grass is removed at any one cutting. For instance, if the desired height of the grass is 2 inches, mow the lawn before the grass reaches 3 inches.

Leave the clippings on the lawn. Clippings can return up to 50 percent of the nitrogen needed by turfgrass.

Mow when the grass is dry to limit disease and for safety reasons.



## UNDER INVESTIGATION...

### LAB CONNECTION: Turfgrass Test Plots

Experimental test plots can be set up at your school. The test plots can be used to evaluate a number of factors involved in the management of turfgrass. The soil for the entire site should be well prepared before planting the grasses. Subdivide the site into individual plots measuring 4 by 6 feet or 6 by 6 feet.

Tests might be set up to evaluate different turfgrass cultivars in terms of their cold tolerance, wear tolerance, and heat and drought tolerance. Plant the selected turfgrass varieties in designated plots.

Different cultural practices might be assessed. Mowing heights, fertilizer rates, and irrigation levels might be tested. Perhaps some plots might be subjected to only organic fertilizers and organic pesticides.

Keep accurate records on the performance of the turfgrasses. Consider using the research as a science fair project. Explore the possibilities of conducting the tests in cooperation with the extension service or a local business.

Rotary mowers are generally used to cut turfgrass 1 inch or higher. Reel mowers are used to cut turfgrass 1 inch or lower. A **rotary mower** cuts grass leaves by the impact of a rapidly rotating blade. A **reel mower** has a rotating reel with blades that cut or slice the grass leaves when they come into position against a stationary bed-knife.

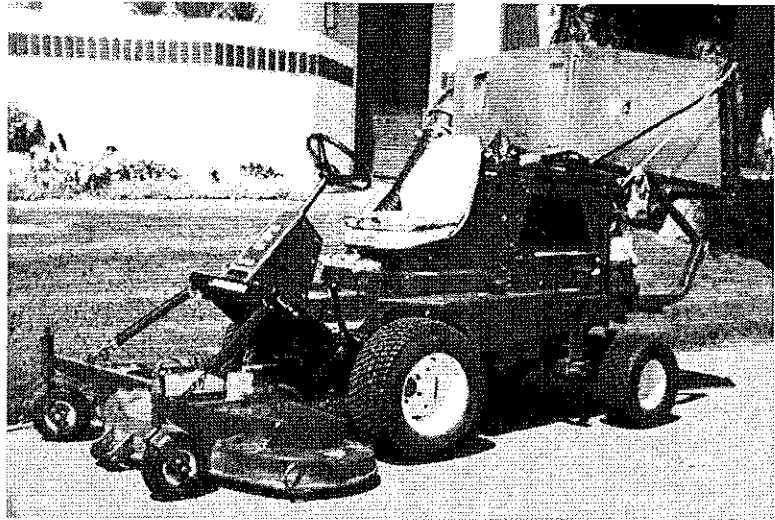


FIGURE 4. A rotary riding mower for lawns and parks.

## IRRIGATION

Adequate amounts of water sustain an actively growing turfgrass. Water is constantly cycling. Liquid water on a surface, such as soil, turns into a gas in a process called **evaporation**. Water is lost from the tissues of plants in a process known as **transpiration**. Transpiration actually helps to keep turfgrasses cool on hot days. **Evapotranspiration** is the loss of water through both evaporation and transpiration. The rate of evapotranspiration is influenced by such factors as height of the turfgrass, temperature, humidity, and wind.

### Irrigation Practices

**Irrigation** is a means of applying water to turfgrass artificially. A general rule is to water infrequently and deeply. This practice promotes the development of a deep root system that helps the plants during drought. Apply about 1 inch of water every 7 to 10 days depending on the evapotranspiration rate. One inch of water soaks soil to a depth of roughly 6 to 8 inches. The amount of water applied can be measured by placing coffee cans or similar containers under the sprinklers or nozzles. Irrigate the turfgrass early in the day to cut the loss to evaporation and reduce the occurrence of leaf diseases.

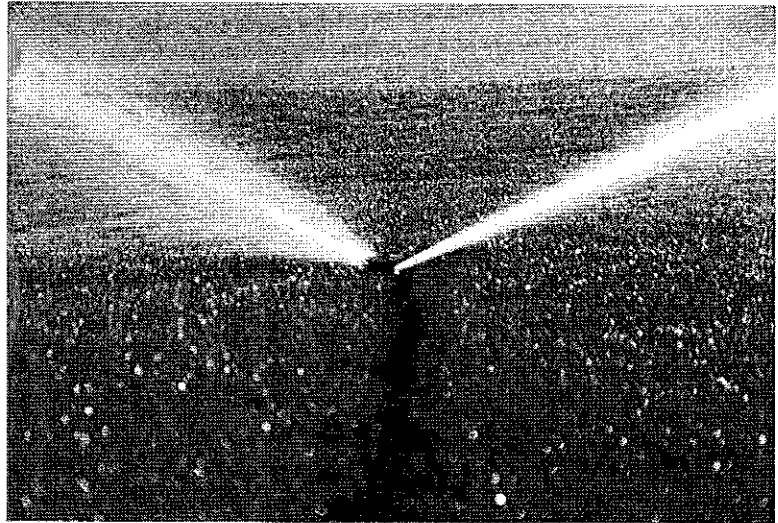


FIGURE 5. Proper irrigation can supplement available water for good turf growth.



## SOIL COMPACTION AND THATCH BUILDUP

Two common problems associated with turfgrasses under intensive care and use are soil compaction and thatch buildup.

### Soil Compaction

Soil compaction often needs to be addressed. Heavy clay soils and those soils with little organic matter tend to compact. **Soil compaction** results from pressure on the soil caused by people and equipment. It reduces the pore spaces in the soil. As a result, water doesn't move through the soil very well, and there is poor exchange of gases. Compacted soils put stress on turfgrasses.



FIGURE 6. Golf courses are subject to soil compaction from high traffic in a limited space.

### Thatch Buildup

**Thatch** is the accumulation of excess live and dead grass stems and roots on the soil surface of the turf. Grass clippings do not contribute to thatch buildup. Thatch usually becomes a problem when the layer exceeds 1/2 inch in thickness. As the thatch accumulates, the turfgrass roots begin growing in the thatch layer rather than in the soil. The turfgrass then becomes more susceptible to drought and disease.

Rapid grass growth from nitrogen fertilizers and shallow frequent watering are causes of most thatch problems. Other causes of thatch buildup include low soil pH, poor soil microbial activity due to excessive fungicide use, and higher mowing heights. Thatch layers are more of a problem with stolon- and rhizome-producing turfgrass species than with the bunch-type turfgrasses.

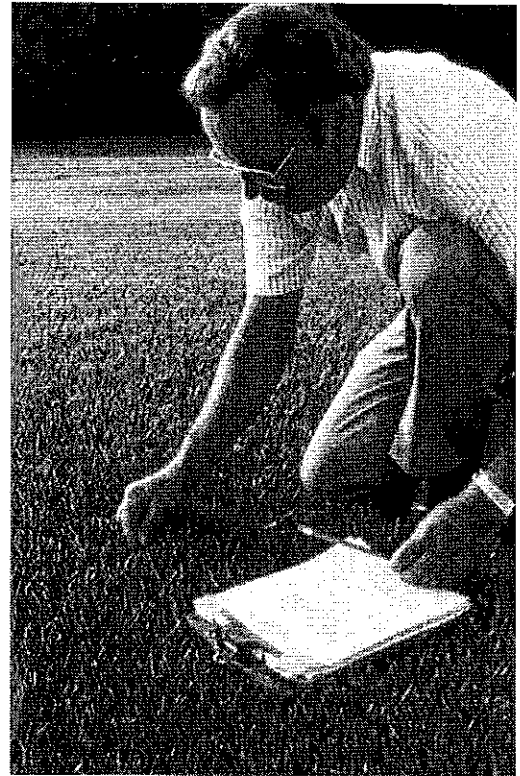


FIGURE 7. Thatch is the accumulation of excess grass stems and roots on the soil surface of the turf. (Courtesy, Agricultural Research Service, USDA)

### Control Measures

Compacted soils and thatch problems can be controlled.

Cultural practices are effective in reducing thatch problems. Avoid excessive nitrogen fertilization. Follow good water practices. When the soil pH is low, apply lime to increase it. Also, reduce the mowing height when possible.

Mechanical methods can be employed to alleviate thatch and soil compaction problems. They involve improving soil conditions by removing soil cores or by slicing the soil without destroying the lawn. Common names for these procedures are soil cultivation, lawn aeration, and aerification. These practices are best used during times of the year when the turfgrass is actively growing.

The most widespread practice of aeration is the use of a **core cultivator**, or aerator. This machine has hollow tines that are forced into the soil to remove  $\frac{1}{2}$ -inch-diameter plugs that are 2 to 4 inches long. The soil plugs taken out eventually break down. Air is then allowed to penetrate into the thatch layer, increasing soil microbe activity to decompose the thatch.

A mechanical dethatcher, or **power rake**, can be used to remove excessive thatch. The thatch is then hauled from the site.

**Topdressing** is a practice of applying a layer of soil materials on the turf surface. Topdressing introduces microbial activity to the surface. As a result, the thatch layer decomposes more rapidly.

### Summary:



The major turfgrass management practices are fertilizing the turfgrass, mowing the turfgrass, irrigating the turfgrass, and addressing soil compaction and thatch buildup.

Nitrogen is the nutrient needed in greatest quantity by turfgrass plants. The recommended rate of application for a home lawn is normally 1 pound of nitrogen per 1,000 square feet two or three times a year.

Mow turfgrass so that no more than one-third of the grass is removed at any one cutting. Leave the clippings on the lawn. Mow when the grass is dry.

Water infrequently and deeply. Apply about 1 inch of water every 7 to 10 days depending on the evapotranspiration rate.

Two common problems associated with turfgrasses are soil compaction and thatch buildup. Soil compaction results from pressure on the soil caused by people and equipment. Thatch is the accumulation of excess live and dead grass stems and roots on the soil surface of the turf.

### Checking Your Knowledge:



1. What are the recommended fertilizer practices for lawns?
2. What are the guidelines for mowing turfgrass?

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5. What can be done to alleviate soil compaction and thatch buildup?

### Expanding Your Knowledge:

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Review the lawn maintenance practices for your own yard. Determine if the turf is receiving the recommended amounts of fertilizer nutrients and water. Is the lawn mowed properly and in a timely fashion? Is soil compaction or thatch a problem?

### Web Links:

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#### Spring and Summer Lawn Management Considerations for Warm-Season Turfgrasses

<http://www.ext.vt.edu/pubs/turf/430-533/430-533.html>

#### Turfgrass Cultivation and Thatch Control

<http://www.turf.uiuc.edu/extension/ext-cult.html>

#### Basic Turfgrass Care

<http://72.14.203.104/search?q=cache:Ogky2tDsNLYJ:extension.usu.edu/files/gardpubs/hg517.pdf+turfgrass+care&hl=en&gl=us&ct=clnk&cd=2>

#### Lawn Care

<http://www.ext.colostate.edu/pubs/Garden/07202.html>

#### Agricultural Career Profiles

<http://www.mycart.com/career-profiles>

Checking Your Knowledge:

1. What are the three main areas of a residential landscape?

2. What are the goals in designing the public area landscape?

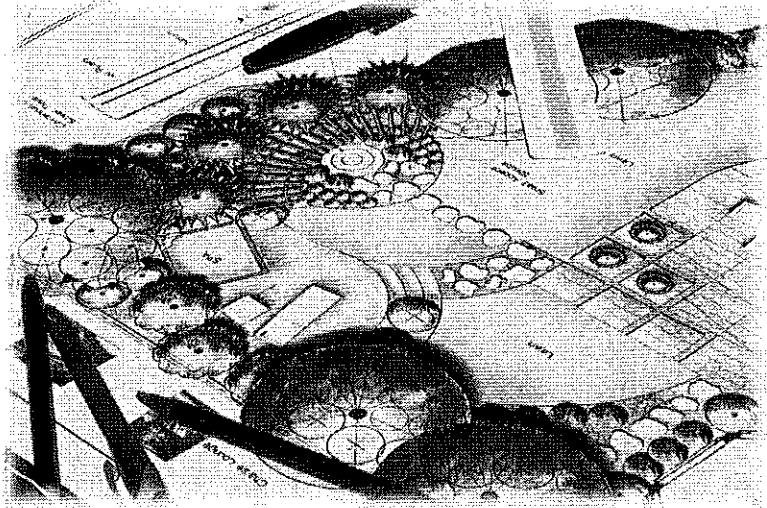
3. What are the elements of the public area?

4. What are some design considerations related to the outdoor living area?

5. What design considerations are associated with the service area?

# Designing the Landscape Areas

**H**AVE YOU EVER thought of a landscape as a room? The floor is grass, paving material, or groundcover. The walls might be plants or fences. The ceiling is the sky or perhaps the overhanging limbs of trees. Thinking of a landscape as a room really offers a different point of view.



## Objective:



Examine design considerations for the major areas of a residential landscape.

## Key Terms:



corner plantings  
decks  
doorway plantings  
enclosures  
focal point

garden accessories  
high-interest plantings  
outdoor living area  
patios  
private area

public area  
service area  
shrub border  
surfaced areas

## Landscape Areas

The usefulness of a residential landscape is often a result of dividing a lot into separate areas. Each area has its own function and is designed differently to meet the needs of the client. Three major areas of a residential landscape are the public area, the outdoor living area, and the service area.

The **public area** is the portion of the property in full view of the public. It includes the area between the house and the road. It gives people their first impression of the house. For that reason, the public area is designed with the appearance of the house in mind. The front door of the home should be treated as a focal point. A **focal point** is an area that draws the viewer's eye and holds the viewer's attention. People should be able to see the front door eas-

ily, and the public area should be designed in such a way that people are led up to the front door.

The **outdoor living area** is where the family spends most of its time when outdoors. This area is usually located behind the home, out of the public's view, and is often called the **private area**.

Areas to the rear or the side of the house set aside for strictly functional purposes make up the **service area**.

## DESIGNING THE PUBLIC AREA

Three goals should be kept in mind when designing the public area. They are to soften architectural lines, frame the house, and maintain open lawn areas.

Careful placement of tree and shrub plantings accomplishes the goals of softening architectural lines and framing the house. Softening architectural lines helps the house to appear as though it belongs in the landscape. The lines produced by the architecture of the house are straight. Vertical lines created at the corners of the house are particularly harsh. A priority should be to design the public area so the sharp architectural lines are softened with plant materials.

The dominant lines of the house should be repeated in the plant materials. If the house has dominant horizontal lines, select trees and shrubs with horizontal branching habits. Houses with dominant pyramidal forms call for trees with pyramidal growth habits.

The dominant architectural masses of the house contribute to visual balance or imbalance of the house. Study the masses and determine how proper placement and massing of plant materials can achieve better balance. A way to do this is to design landscape plantings that repeat the architectural masses at the side of the house opposite the plantings. For example, if the right side of the house appears as a large, blocky mass, plan a large, blocky mass of plants to the left side of the house. This reversal of location promotes a balanced view.

When the house has abundant architectural details, use simple plantings with neutral green colors and rounded forms. Houses simple in design permit more variety in the landscape plantings.

The goals for designing the public area can be further achieved by manipulating four elements that make up the public area. The four elements of the public area are paved surfaces,

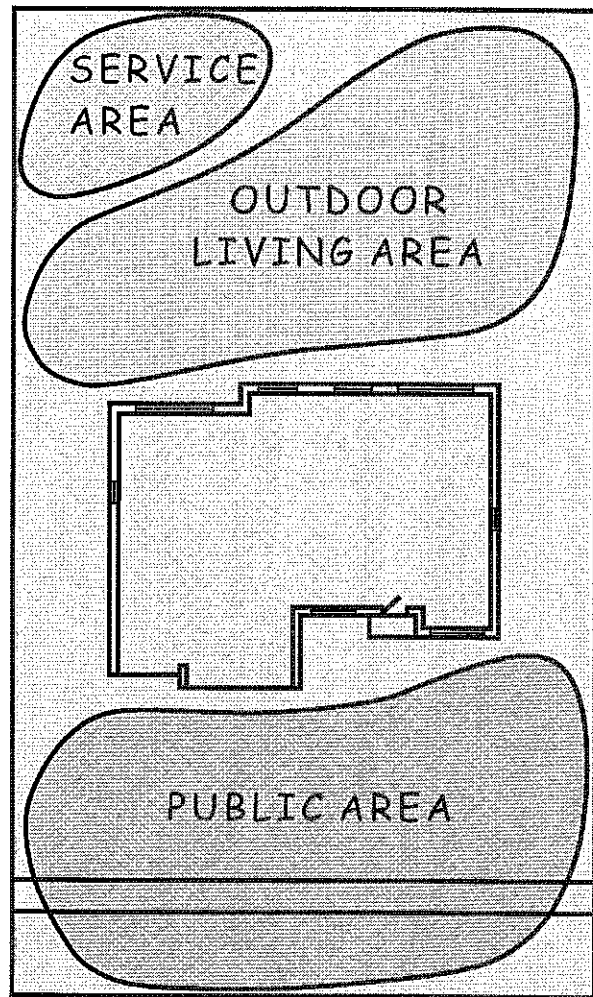


FIGURE 1. The home landscape has three main areas.

trees, shrub plantings, and lawn or groundcover. Together, the elements of the public area contribute to a functional and attractive landscape.

### ***Paved Surfaces***

Walks and driveways are important considerations in the design process. They need to be functional. Well-designed walks and driveways appear to blend into the landscape. Because the entry walk leads guests to the front door, it should follow a direct line and be wide enough for two people to walk side by side.

The best walk design is one that parallels the front of the house and connects with the driveway. Design the driveway so it will meet the needs of the client without being excessive. A driveway for a single car should be a minimum of 10 feet wide. A single-car driveway that also serves as a walk connecting the entry to the street should be at least 11 feet 8 inches wide. A driveway for two cars should be 18 feet wide. A circle driveway needs to be 14 to 18 feet wide, depending on the curve.



**FIGURE 2.** Walks and driveways make up one element of the public area.

### ***Trees***

Well-positioned trees frame the house much as a picture frame frames a picture. Most people view the house at roughly a 30- to 45-degree angle. Therefore, locate trees so they will frame the house at a 30- to 45-degree angle from the street. Select trees whose mature size will match the size of the house. For instance, a two-story house requires larger trees for effective framing than a single-story house. Trees provide shade in the summer. They can also be used to mask or screen awkward architectural features.



**FIGURE 3.** This house has been framed with trees.

## Shrub Plantings

Shrub plantings are used in the public area to soften the vertical lines of the house and hide the foundation. Use foundation plants at the corners of the house and at the doorway. They are also helpful in breaking up a broad expanse of wall. Evergreen plants lend color to the landscape throughout the year.

Select foundation plants with natural, open forms that soften architectural lines. Consider the mature size of the shrubs during the selection process and draw them at their mature size on the landscape plan.

Plants placed at the corners of the house are referred to as **corner plantings**. Use plants with rounded forms, and arrange them in group plantings. Each grouping should consist of several different plant species that complement one another. A good practice is to select plants for corner plantings that will not grow taller than two-thirds the distance from the ground to the eaves.

**Doorway plantings** are located on either side of the entry door. These plantings may be identical if the architecture of the house has formal (symmetrical) balance. Since most houses have informal (asymmetrical) balance, different plantings on either side of the door should be designed. Shorter plants should be used for doorway plantings. The height of the shrubs is determined by following a line from the threshold of the door to a point at the corners of the house that is two-thirds the distance from the ground to the eaves. Choose plants that have a mature height at or below this line. Usually, doorway plants are no taller than one-fourth to one-third the distance from the ground to the eaves. Placing of taller plants at the corners and shorter plants at the doorway draws the viewer's eye toward the door.

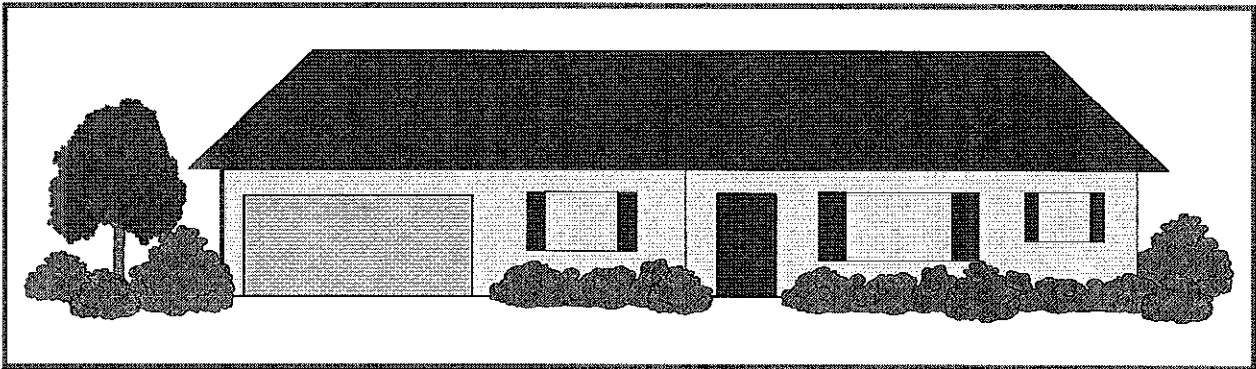


FIGURE 4. Doorway plants are usually no taller than one-fourth to one-third the distance from the ground to the eaves.

## Lawn or Groundcover

Lawn or grass areas unite all elements of the public area. The lawn also provides a broad, expansive setting for the house. These qualities improve the overall appearance of the landscape and the house. Maintaining a large unbroken expanse of lawn area is important. Avoid dividing the lawn with walks, driveways, and island plantings. Place all shrubs in planting beds. Shrubs scattered throughout the lawn create a design that appears unorganized.



## DESIGNING THE OUTDOOR LIVING AREA

The design of the outdoor living area focuses on utility and beauty. Family gardening interests and entertainment activities are taken into consideration. The outdoor living area should be thought of as an outdoor room. A room has an enclosed feeling to it. Through the placement of walls, a floor, and a ceiling, a room can be created, giving the people who enter it a warm, private, comforting feeling. Outdoor rooms can be created through the use of enclosures, surfaced areas, plantings, and garden accessories.

### Enclosures

**Enclosures** or walls help to screen views and define space in a landscape. They provide privacy. They can also provide protection from the elements or serve as backdrops for accent plants. Several materials can be used to help create a sense of enclosure. Living walls can be made of evergreen shrubs or trees. Solid wooden fences and stone walls can also provide enclosure to a landscape.

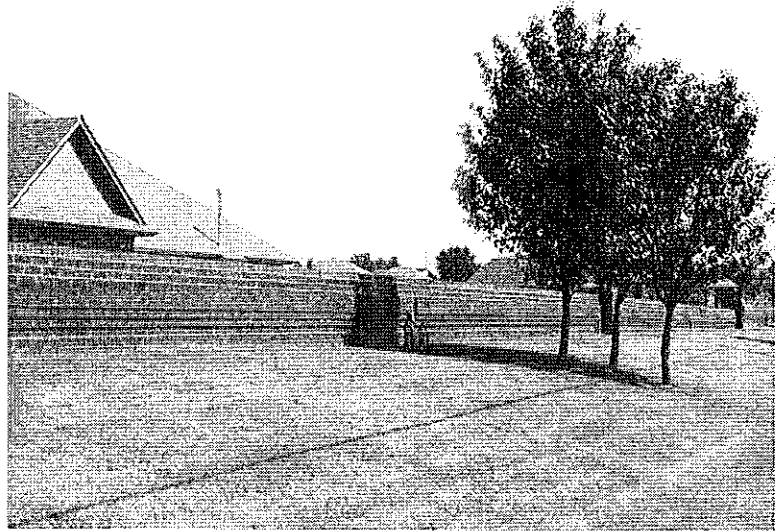


FIGURE 5. This brick wall provides protection from the elements and creates a sense of enclosure.

### Surfaced Areas

**Surfaced areas**, such as walks, paths, sitting areas, patios, and decks, become the outdoor floor. People get the feeling that they are actually entering a different area as they step onto a different surface. Several types of flooring can be used and still achieve a smooth transition from one area of the yard to another. Some surfacing materials like moss and other groundcovers are mainly ornamental, as they do not hold people's weight. They are used to tie the planting beds together and can add interest to the yard.

Nearly every house built today is constructed with a patio or deck in mind. **Patios** are built with hard, permanent materials and are level with the ground. Brick pavers, concrete, and flagstone are common surface materials for

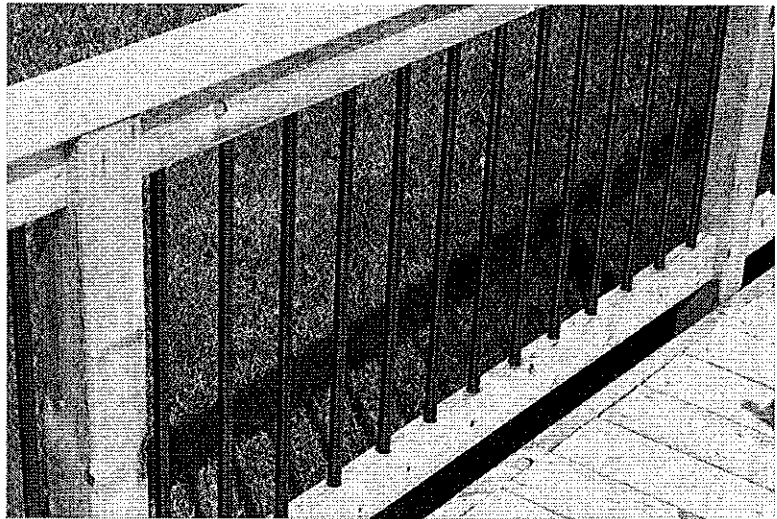


FIGURE 6. Wooden decks require more maintenance than patios.

patios. **Decks** are wooden-surface areas raised above the ground level. Cedar, redwood, and wood treated to resist decay are used in deck construction. Decks require more maintenance than patios.

## Plantings

Plantings of shrubs, trees, perennials, annuals, and groundcovers in the outdoor living area serve many functions. The primary function of plants, however, is to provide pleasure for the homeowner.

Well-designed shrub borders provide viewer interest from the deck or patio as well as from indoors. A **shrub border** is a massing of a collection of shrubs along the property line or at the edge of the lawn area.

Some plantings, called **high-interest plantings**, are designed to capture the attention of the viewer and to provide interest to the garden. High-interest plantings should be placed in full view from the patio or deck and from rooms inside the house. Carefully designed plantings provide interest for persons inside throughout the year. Annual and perennial gardens give a splash of color to the landscape.

Trees provide shade and a ceiling for the outdoor living space. The ceiling in the outdoor living area involves overhead features. Except in heavily wooded lots, the sky composes most of the ceiling. Maintain open areas in the design to view the sky. Trees provide the next most common ceiling element. The limbs of shade trees planted near the patio become part of the ceiling in the outdoor living room. Trees also provide shade for a play area or the patio. The ceiling helps bring the yard down to a more comfortable level and creates a sense of privacy. Through the use of an arbor, trellis, or patio umbrella, people can be protected from wind, rain, or the sun's rays.

## Garden Accessories

**Garden accessories** are items in the landscape that attract attention and provide interest. They include sculptures, pools, fountains, rocks, furniture, and lighting. Garden accessories can be used as focal points. As a rule their use should be confined to the outdoor living area, because they are attention-grabbing items. When placed in the public area, they steal attention from the house. This breaks the rule of landscaping that the house is to be made the center of attention.

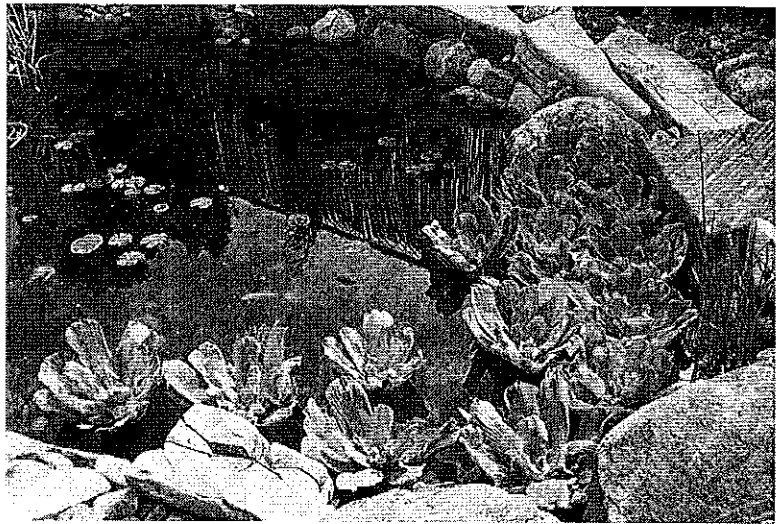


FIGURE 7. A water garden is an interesting and enjoyable garden attraction.

## DESIGNING THE SERVICE AREA

The service area might include garbage cans, garden storage sheds, clotheslines, compost piles, and vegetable gardens. The service area is typically screened from view because of the nature of the activities. Good designs often incorporate service area activities into the rest of the plan. For example, the vegetable garden and compost pile might fit nicely inside a planting bed.

Children's play areas should blend in with the landscape. They are best placed where they are less noticeable. However, for supervision of the children, an open line of sight to the patio and from a room indoors should be considered. In sunny, warm climates, overhead protection should be provided with well-placed shade trees.

### What's Your Profile?



➤ Interested in the information presented in this E-unit?  
You might make a great Landscape Designer!

Check out: [www.myaert.com/career-profiles/cp-landscape-designer.pdf](http://www.myaert.com/career-profiles/cp-landscape-designer.pdf)

➤ Looking for something a little different?  
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### Summary:



Three major areas of a residential landscape are the public area, the outdoor living area, and the service area. The public area is the portion of the property in full view of the public. The outdoor living area is where the family spends most of its time when outdoors. Areas set aside for strictly functional purposes make up the service area.

Three goals in designing the public area are to soften architectural lines, frame the house, and maintain open lawn areas. The four elements of the public area are paved surfaces, trees, shrub plantings, and lawn or groundcover.

The design of the outdoor living area focuses on utility and beauty. The outdoor living area should be thought of as an outdoor room, with enclosures, surfaced areas, plantings, and garden accessories.

The service area might include garbage cans, garden storage sheds, clotheslines, compost piles, and vegetable gardens. This area is typically screened from view.

### Checking Your Knowledge:



1. What are the three main areas of a residential landscape?
2. What are the goals in designing the public area landscape?

3. What are the elements of the public area?
4. What are some design considerations related to the outdoor living area?
5. What design considerations are associated with the service area?

### Expanding Your Knowledge:

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Study your own yard or that of a family member or neighbor. Does the design of the public area, outdoor living area, and service area address the goals outlined in this lesson? What would you do differently?

### Web Links:

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#### Developing the Landscape Plan

<http://muextension.missouri.edu/explore/agguides/hort/g06901.htm>

#### Landscape Design for Homes

<http://www.uvm.edu/extension/publications/oh/oh29.htm>

#### Diagram

<http://aggie-horticulture.tamu.edu/extension/homelandscape/diagram/diagram.html>

#### Agricultural Career Profiles

<http://www.mycart.com/career-profiles>

Mr. Coon Hort  
Checking Your Knowledge:

Power Tools option3

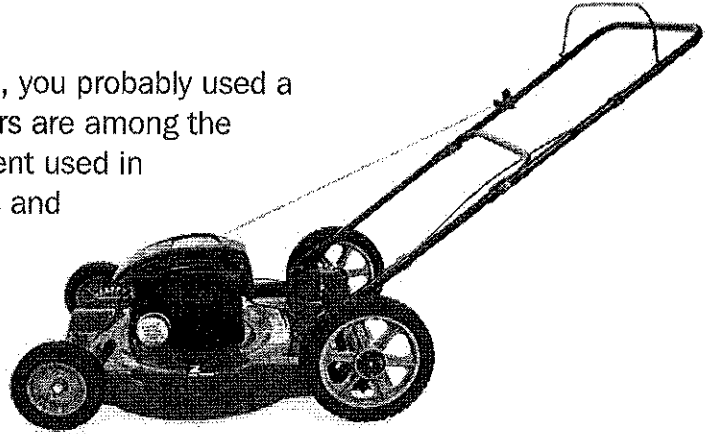
April 27

Name

1. What power tools and equipment are used in turfgrass maintenance?
2. What power tools and equipment are used for maintaining woody landscape plants?
3. What are some miscellaneous power tools and equipment used in landscaping?
4. What are some proper maintenance and storage practices for power tools and equipment?
5. What are some safety practices associated with the use of a bench grinder?

# Using Power Tools and Small Landscape Maintenance Equipment

**H**AVE YOU EVER mowed a lawn? If so, you probably used a gasoline or electric mower. Mowers are among the most common power tools and equipment used in landscaping. However, many other tools and equipment powered by small engines and electric motors are also used in landscaping.



## Objective:



Discuss power tools and small equipment used in landscaping.

## Key Terms:



- |                |                    |                 |
|----------------|--------------------|-----------------|
| aerator        | leaf blower        | rototiller      |
| bench grinder  | masonry saw        | shredders       |
| chain saw      | plate compactor    | soil sterilizer |
| circular saw   | power hedge shears | spreaders       |
| concrete mixer | power pole pruner  | string trimmer  |
| dethatcher     | reel mower         |                 |
| grass edger    | rotary mower       |                 |

## Power Tools and Small Equipment for Landscape Work

Many power tools are used in the landscape industry. These power tools greatly increase the efficiency of the work. Power tools may be electric motor powered or gasoline engine powered.

## TURF MAINTENANCE EQUIPMENT

Turfgrass requires more maintenance than any other element of a landscape. Power tools and equipment, such as mowers, string trimmers, edgers, leaf blowers, aerators, dethatchers, spreaders, and sprayers, are widely used to maintain turf.

### Mowers

Mowers may be push, self-propelled, or riding mowers. A quality mower is essential to quality turf management. A **rotary mower** cuts by using one or more blades that turn in a circle. Most home lawns are cut by rotary mowers to a 2- or 3-inch height. A **reel mower** uses a curved turning cylinder that comes into position against a stationary bed-knife to cut the grass. A properly sharpened reel cuts like a pair of scissors, leaving a clean cut with a very smooth surface. Reel mowers are used in areas where grass is mowed short. Golf course greens, tees, and fairways are mowed with reel mowers.



FIGURE 1. A reel mower.

### String Trimmers

A **string trimmer** is used to trim grass and weeds in areas not accessible to a mower. A string trimmer uses plastic string for grass and weeds but can also be equipped with a steel blade to cut large weeds and small trees. Small string trimmers may be electric powered. Gasoline engines are used with more powerful units.



FIGURE 2. A string trimmer is being used to edge along a building.

## Edgers

A **grass edger** is used to trim the grass along the edges of sidewalks and driveways. The gasoline engine powers a belt-driven pulley that turns a 10-inch cutting wheel. The cutting height is adjusted at the handle. Edgers may also be electric powered.

## Leaf Blowers

A **leaf blower** blows leaves, grass clippings, and other debris from landscape beds, sidewalks, and driveways.

## Aerators

An **aerator** is a tool used to remove cores of soil in compacted areas. It is also called a core cultivator. After aeration, sand may be topdressed over the turf to fill the holes. The soil cores with grass decompose and work back into the turf. A small aerator can be pulled behind a riding mower.



FIGURE 3. A self-propelled aerator is being used to promote turf growth.

## Dethatchers

A **dethatcher** is a machine designed to lift the thatch out of the turf. It also is known as a power rake. The dethatcher is usually pulled behind a riding mower. Heavy fertilization of grass causes the grass to grow more rapidly than old stems can decay. As the thatch layer builds up, the grass roots begin to grow in the thatch. When this happens, the grass is subject to stress that can lead to disease.

## Spreaders

**Spreaders** are used to distribute seed and fertilizer. Spreaders may be drop- or broadcast-type spreaders. Most power spreaders are the broadcast type and used mainly on large areas, such as parks and golf courses.

## Sprayers

Power sprayers are used to distribute pesticides in large areas, such as parks and golf courses. They are also employed to apply materials on trees.



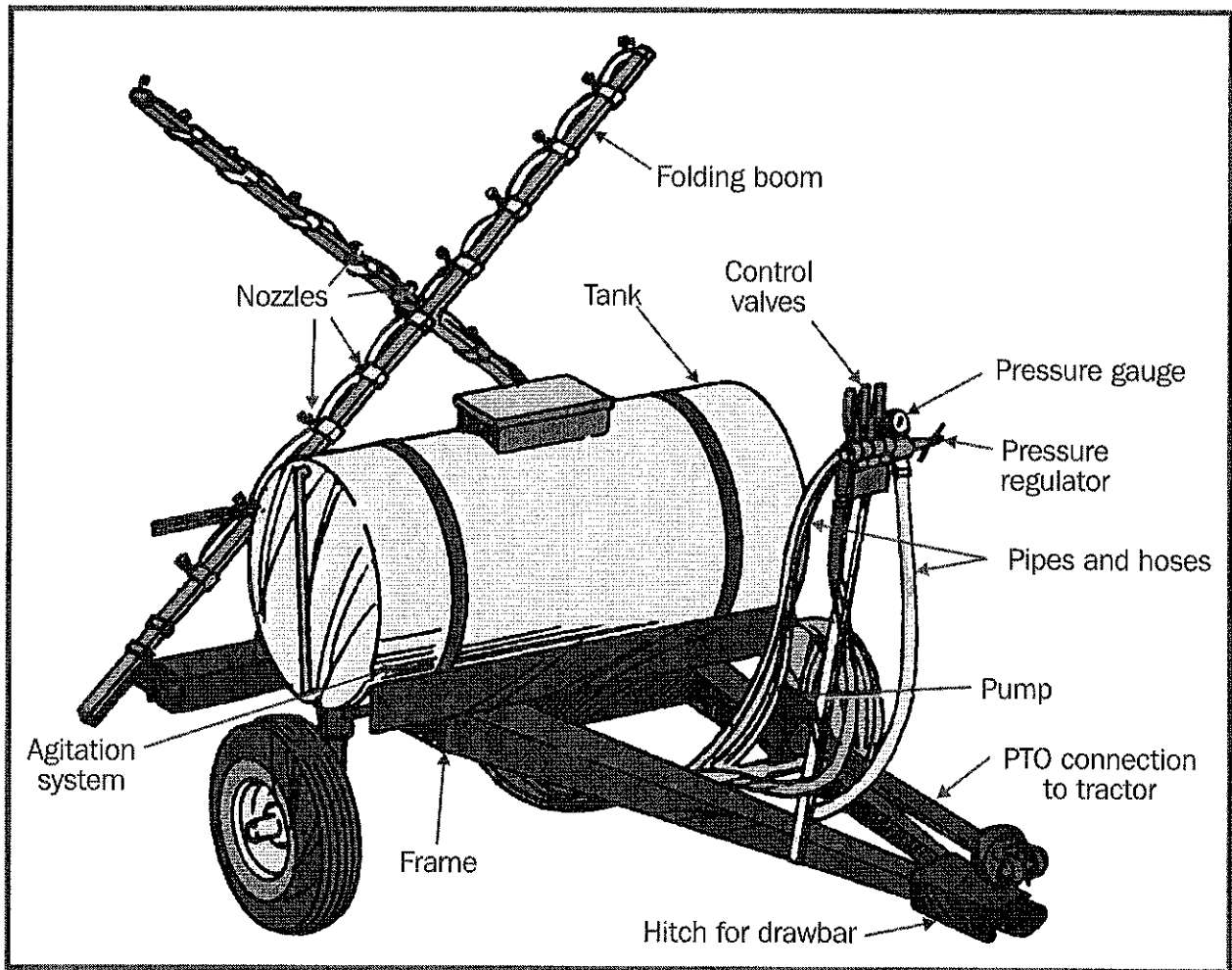


FIGURE 4. The major parts of a pull-type power sprayer.

## WOODY PLANT MAINTENANCE EQUIPMENT

The maintenance of woody landscape plants is made much easier by the use of power tools. Power hedge shears, power pole pruners, chain saws, and shredders help complete important tasks.

### *Power Hedge Shears*

**Power hedge shears** may be electric powered or gasoline powered. Power hedge shears can be used to prune small shrubs but are most useful in pruning hedges. When using electric-powered shears, keep the cord away from the cutting edge. Be sure you are positioned so that you have good footing and balance during the operation of the shears.

## Power Pole Pruners

A **power pole pruner** uses air pressure created by a gasoline engine to allow you to close the jaws with minimal physical effort. The main use of the power pole pruner is in an orchard where many trees need pruning.

## Chain Saws

A **chain saw** uses a rotating chain with teeth to cut wood. Some small chain saws are electric powered, but most chain saws are powered by two-cycle engines that require mixing oil with the gasoline. A chain saw is an efficient tool for cutting branches of more than 2 inches in diameter. Use extreme caution when operating a chain saw. The potential for serious injury to the operator is great. Wear safety goggles and ear plugs, keep the chain tightened and sharp, maintain good balance, and hold the saw securely with both hands. Select a saw with kickback protection. Use the bottom side of the chain to cut. Never cut with the end of the chain.

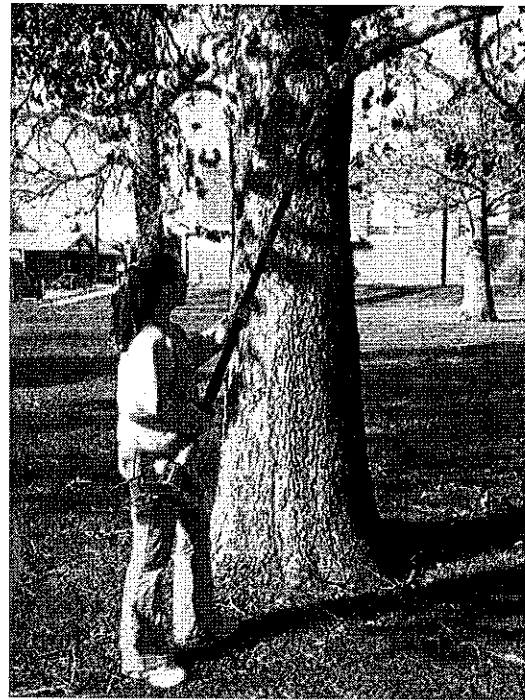


FIGURE 5. A power pole pruner makes it easy to reach and cut high limbs.

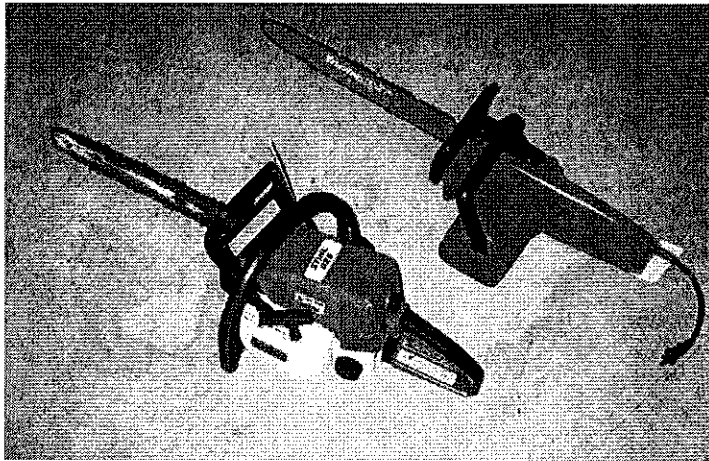


FIGURE 6. A chain saw is powered by a two-cycle engine (left) or an electric motor (right).

## Shredders

**Shredders**, or chippers, are used to grind up branches and other plant material. The resulting wood chips can be added to compost piles or used as mulch in landscape beds. Shredders come in all sizes. Follow the manufacturer's recommendations for the

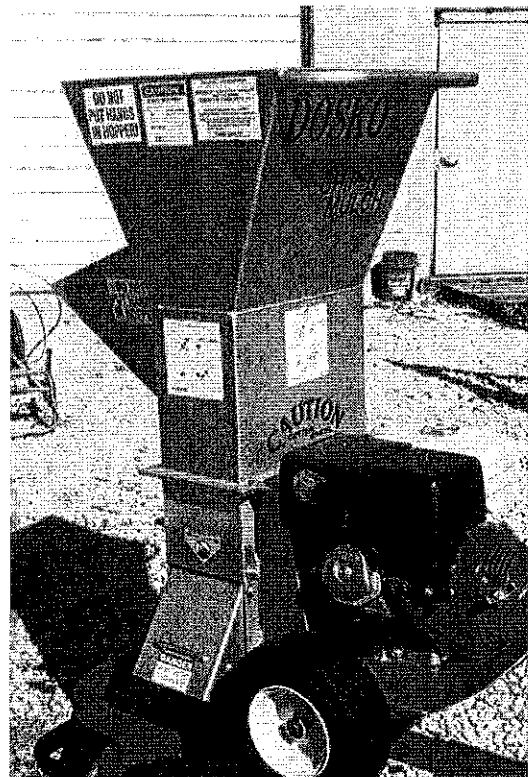


FIGURE 7. A shredder is used to grind up branches and other plant material.

one being used. Throw material into the shredder. Never push the material with your hands. Branches are grabbed and pulled into the machine. If you have your hands on a branch, they may be pulled in. Safety glasses or goggles should be worn when shredding.

## OTHER POWER TOOLS AND EQUIPMENT

Some other power tools and equipment used in landscaping include rototillers, soil sterilizers, concrete mixers, bench grinders, circular saws, masonry saws, and plate compactors.

### Rototillers

A **rototiller** is useful in preparing seedbed areas for turf or landscape beds. Bigger areas require the use of larger tillers. Small tillers are usually front tine, and larger tillers are usually rear tine. Steel-toed shoes protect feet from injury that can occur during tiller operation. Adjust the depth of the tiller to match the hardness of the soil. A tiller set deep on hard, compacted soil or sod can pull you as it skips along on the top of the ground. Start with a shallow setting and use two or three passes to go deeper.

### Soil Sterilizers

A **soil sterilizer** is a piece of equipment used to pasteurize soil. Sterilizers generally use electric power to generate heat for making steam. Soil temperature must be brought to 180°F (82°C) and held there for 30 minutes to destroy disease-causing organisms and weed seeds effectively.

### Concrete Mixers

A **concrete mixer** is a rotating drum of 4 or 9 cubic feet. It is primarily used for mixing concrete. However, it can also be used for mixing soil with amendments, such as peat moss, dried cow manure, and commercial fertilizer.

### Bench Grinders

A **bench grinder** is used for sharpening spades, hoes, mower blades, and other tools. An electric motor turns an abrasive wheel. The tool to be sharpened is held against the wheel.

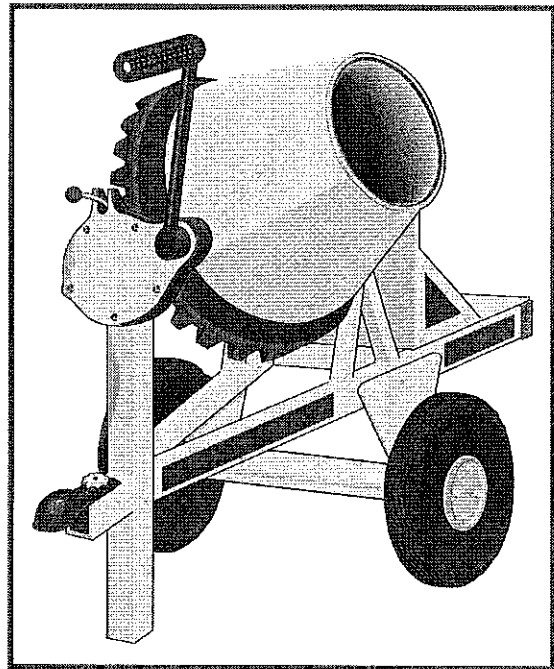


FIGURE 8. A concrete mixer can be used to mix soil and manure.

## Circular Saws

A **circular saw** is one of the most commonly used handheld electrical saws. It is used primarily for cutting wood. Circular saws are often needed for deck and wood fence projects.

## Masonry Saws

A **masonry saw** is used to cut bricks, pavers, concrete, and similar materials. There are many different models. They may be gasoline or electric powered. Masonry saws can cut materials used for patio, walk, and driveway construction.

## Plate Compactors

A **plate compactor** is a piece of equipment used to compact base materials for patios, walks, and driveways. It consists of a metal plate on which a gasoline engine sits. The plate vibrates as the compactor operates. The plate compactor is also used to set brick pavers and other paving materials after they have been placed.



FIGURE 9. A circular saw is commonly used for cutting wood.

## MAINTENANCE AND STORAGE OF POWER TOOLS AND EQUIPMENT

Proper maintenance and storage of small power tools is essential for keeping equipment in good working order. Most electric-powered tools are relatively maintenance free. Bearings and gears are lubricated and sealed at the factory. Gasoline-powered equipment needs to be serviced on a regular schedule. Operators' manuals also give detailed information.

A beginning point for preventive maintenance is keeping tools and equipment clean. The outside appearance of a tool is often an indication of the owner's concern or lack of concern for preventive maintenance.

Check every power tool for defects before it is used. Unplug electric tools while checking and repairing them. Do not use tools that create a potential safety hazard, such as electric tools with damaged cords or tools with missing or defective guards/shields. Do not operate electric tools in wet or damp areas. Operate gasoline-powered tools only in well-ventilated areas.

Chains or belts need to be checked for tightness and wear. Loosen cogs when installing a new chain, and pulleys before installing a new belt.

Store tools in a clean, dry location. If the tools are always stored in the same place, you will save time trying to find them.

## Sharpening Tools

Cutting edges of tools should be kept sharp. The results are safer, more efficient tools that do high-quality jobs. Use hand files or a power grinder to sharpen tools.

If a grinder is to be used, inspect the wheel for cracks or chips beforehand. A medium-grain wheel is used for rough grinding where a quantity of metal needs to be removed. A fine-grain wheel is used for sharpening tools that require smooth or exact edges.

Always use a face shield or goggles when grinding. Protect your hands with leather gloves.

Hold small items with vise grips. Larger items need to be held firmly in your hands or ground with a portable grinder.

Do not use the side of the grinding wheel. The pressure and uneven heating can cause the wheel to crack and fly apart.

Be sure the tool rest is slightly above the center of the wheel and adjusted to within  $\frac{1}{8}$  inch of the wheel. Adjust the tool rest angle to match the angle of the item being ground.

Keep a supply of water nearby into which tools can be dipped to prevent their overheating while they are being ground.

## Summary:



Power tools and equipment for turfgrass maintenance include mowers, string trimmers, edgers, leaf blowers, aerators, dethatchers, spreaders, and sprayers. The two most common types of mowers are rotary mowers and reel mowers.

Power tools and equipment used in the maintenance of woody landscape plants are power hedge shears, power pole pruners, chain saws, and shredders.

Some other power tools and equipment used in landscaping include rototillers, soil sterilizers, concrete mixers, bench grinders, circular saws, masonry saws, and plate compactors.

Proper maintenance and storage is essential for keeping equipment in good working order. Most electric-powered tools are relatively maintenance free. Gasoline-powered equipment needs to be serviced on a regular schedule. Keep tools and equipment clean. Check power tools for defects before use. Check tools with chains or belts for tightness and wear. Store tools in a clean, dry location.

## Checking Your Knowledge:



1. What power tools and equipment are used in turfgrass maintenance?
2. What power tools and equipment are used for maintaining woody landscape plants?
3. What are some miscellaneous power tools and equipment used in landscaping?

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4. What are some proper maintenance and storage practices for power tools and equipment?
  5. What are some safety practices associated with the use of a bench grinder?

### Expanding Your Knowledge:

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Familiarize yourself with power tools and equipment used in landscaping. Learn more about the operation of landscape power tools and equipment by visiting a landscaper, golf course, park district, or other entity where such tools and equipment are used.

### Web Links:

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#### Equipment

<http://www.ipm.ucdavis.edu/TOOLS/TURF/MAINTAIN/mowequip.html>

#### Nursery Landscape Tools and Equipment

[http://aged.ces.uga.edu/Photos%20and%20Clipart/Nursery\\_Landscape\\_tools\\_and\\_Equipment/index.htm](http://aged.ces.uga.edu/Photos%20and%20Clipart/Nursery_Landscape_tools_and_Equipment/index.htm)

#### Nursery/Landscape Equipment Index

[http://www.okstate.edu/ag/asnr/hortla/needham/extension/ffa/nrsy\\_equipident.html](http://www.okstate.edu/ag/asnr/hortla/needham/extension/ffa/nrsy_equipident.html)

#### Agricultural Career Profiles

<http://www.myaert.com/career-profiles>