

OAKLAND CUSD #5

LANDSCAPING

MAY 4 - 8, 2020

JEFF COON

Week of May 4-10, 2020

All of these assignments are on google classroom. You must pick one of the 3 listed and complete by next Monday May 16th 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.

Class	Choice 1	Choice 2	Choice 3
Ag Science	CDE	DNA	Ag and Environment
Ag Business Mang	Investments	Life Insurance	Bus. Plan
BSAA	Seed Germination	Animal Diseases	Ag and Environment
Landscape Design	Soil Erosion	Annuals and perennials	Building walls and decks
Intro To Ag	FFA Meetings	FFA opportunities	Role of Agriculture
Ag Mech.	Concrete	Hydraulics	GSI

Checking Your Knowledge:

1. What is soil erosion?

2. What is the three-step process of erosion?

3. What are the types of wind erosion?

4. What are the types of water erosion?

5. What are some practices that can be employed to manage erosion?

Understanding Soil Erosion and Management Practices

“**M**AN HAS only a thin layer of soil between himself and starvation.” This quotation, attributed to Bard of Cincinnati, clearly states the importance of soil. The future of humankind could depend on soil erosion and soil management practices.



Objective:



Discuss the causes of soil erosion and the management practices that reduce soil erosion.

Key Terms:



accelerated erosion
conservation tillage
cover crops
diversion ditches
glacial erosion
grassed strips
gully erosion
land slippage

mulching
natural erosion
rill erosion
runoff
saltation
sediment
sheet erosion
silt fences

soil erosion
strip cropping
surface creep
suspension
terraces
water erosion
wind erosion
windbreaks

Soil Erosion

Soil erosion is the movement of soil by wind, water, or other natural action. The erosion process involves three distinct steps. The first is the loosening of soil particles. The second is the moving of soil particles. The third is the deposition of soil particles. Vegetation and other coverings help prevent soil erosion. When the soil is exposed, it is vulnerable to erosion. Land that is eroded loses fertility and productivity. Also, the soil lost may pollute water or air. Two basic classes of erosion are natural erosion and accelerated erosion.

Natural erosion, sometimes referred to as geologic erosion, occurs on land not disturbed by humans. Examples are changes in the earth, such as rounding off mountains and filling in valleys. Soil deposits from erosion can form highly fertile areas, such as the Mississippi Delta.

Accelerated erosion usually results from human activity on the land. Construction and plowing are two activities that lead to accelerated erosion. The outcome of these and similar activities is a rapid rate of erosion and a loss of soil fertility.

CAUSES OF EROSION

Erosion is caused by many different factors, including wind, water, glacial movement, and land slippage. When cleared of protective covering, land is much more susceptible to erosion caused by wind and water.

Wind Erosion

Wind erosion is the loss of soil due to the movement of wind over the land. It occurs when persistent or frequent high-velocity winds blow across dry, residue-free soil surfaces. It is common in dry climates, where the soil is loose. Wind erosion also takes place on newly plowed fields, construction sites cleared by large equipment, and land where vegetation has been grazed too short. Wind erosion causes air pollution, produces highway safety hazards, and fills drainage ditches. Wind moves soil by suspension, saltation, and surface creep.

Suspension is a phenomenon in which very small soil particles become airborne. They are carried in the same general direction as the wind. Because the soil particles are small, they remain in suspension. Dust storms are examples of suspension.

Saltation occurs when the wind lifts medium-sized soil particles into the air. They are too heavy to remain in suspension, so they bounce and hop along the ground. In the process, they loosen other soil particles.

Surface creep occurs as saltation takes place. The soil particles that are too heavy to be moved by saltation are moved along the surface by the impact of soil particles being displaced by saltation.

Water Erosion

Water erosion is the loss of soil due to water movement. It is the major cause of soil loss in North America. Water erosion takes place when excess rainfall creates runoff that carries soil away. **Runoff** occurs when rain falls faster than it can be absorbed into the soil. Runoff water carries soil particles into streams and rivers. Runoff leads to water pollution and sediment.



FIGURE 1. Light-colored soils have lost topsoil to erosion. (Courtesy, Natural Resources Conservation Service, USDA)

Sediment is the soil deposited in the bottom of streams, riverbeds, and ditches. Three types of water erosion are sheet erosion, rill erosion, and gully erosion.

Sheet erosion results when thin layers, or sheets, of soil are worn away. Sheet erosion can arise on nearly level land or on sloping land. Evidence of sheet erosion is muddy water moving off a field. Sheet erosion may go unnoticed since no channels form. However, it may be just as problematic as erosion that is more apparent.

Rill erosion usually occurs on sloping land, where small channels are formed by running water. The signs of rill erosion can be masked by normal tillage practices.

Gully erosion occurs when rills continue to wash away and become more severe. It is more likely to occur on steeper slopes. Gullies cannot be smoothed by normal tillage practices.

Glacial Erosion

Glacial erosion occurs when the front edge of a glacier pushes soil, rocks, and other materials. Glacial erosion during the ice ages played a huge role in shaping the land. Soil erosion from glaciers is of minor importance today except in areas where glaciers exist.

Land Slippage

Land slippage occurs on sloping land that is wet. Soil saturated with water slips down a hillside or mountain slope. Land slippage is also known as a mudslide or landslide. Banks along highways, streams, and water fronts are often subject to slides.



FIGURE 2. Severe sheet and rill erosion after heavy rains. (Courtesy, Natural Resources Conservation Service, USDA)

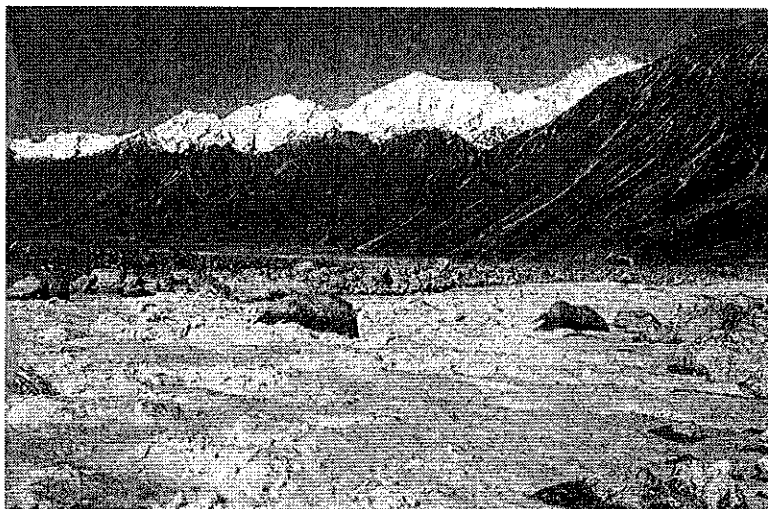


FIGURE 3. Glaciers have played a huge role in shaping the land.

EROSION CONTROL

Soils are important to our society. Erosion of soils reduces agricultural productivity and environmental well-being. Fortunately, soils can be managed to reduce levels of erosion in both urban and rural settings.

Urban Erosion Management

In urban areas, the main concerns are keeping soil covered and controlling water runoff. This applies to construction sites, roads, parking lots, and recreational areas. Erosion management in urban areas includes a wide range of practices.

Mulching is placing a layer of wood chips, straw, or other material on the top of soil to protect it from wind and water. The mulch covering lessens the impact of raindrops, and soil particles cannot be lifted by the wind.

Silt fences are placed at the bottoms of slopes to prevent soil from being carried away by water. The fences allow water to flow but block soil particles. This keeps sediment out of streams and lakes and prevents the loss of soil. Hay and synthetic fabrics are typically used for silt fences.

Other management practices are also followed. Cover crops can be planted on excavated soil. Structures can be located on the contour of the land to slow water flow. Banks can be stabilized with riprap, fabrics, straw, vegetation, and concrete. Trees, shrubs, and grasses can be planted to hold the soil in place. Also, storm water can be managed to curb erosion effectively.

Rural Erosion Management

Nurseries and other agricultural practices utilize soil for growing crops. This creates loose soil that can be easily eroded. Management practices can be implemented to reduce soil erosion.

Conservation tillage can be practiced by planting crops with little or no plowing. With conservation tillage, crop residue from the previous year is left on the soil surface to help hold the soil in place.

Terraces, which are ridges or rows of earth mounds placed across a slope, can be installed. Terraces prevent rapid water flow and aid in holding soil in place.

Grassed strips near plowed areas can be planted to slow the flow of water and help keep gullies from forming.

Diversion ditches can be built across slopes to slow water movement and divert water to a safe outlet.

Strip cropping, or the planting of alternating strips of crops on sloping land, can be practiced. The strips slow the flow of water and hold the topsoil in place.

Fields can be planted after the fall harvest with winter **cover crops**. Cover crops can add to fertility and protect the soil from erosion.

Crops can be planted on the contour to slow the flow of water and to allow water to be absorbed. This involves planting around slopes rather than up and down them.

Windbreaks consisting of rows of trees can be planted to slow blowing wind.

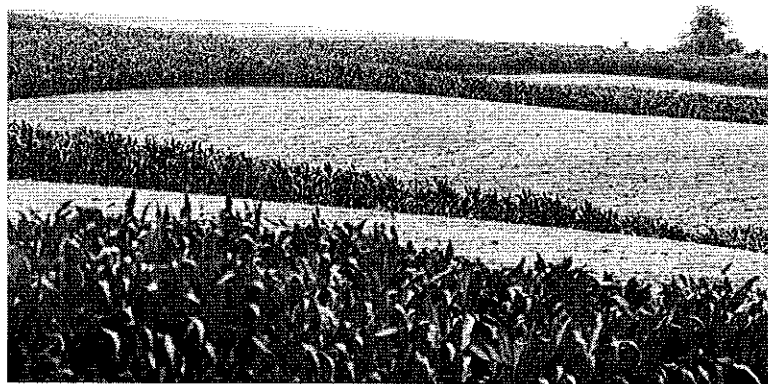


FIGURE 4. Strip cropping helps prevent soil erosion.

Summary:



Soil erosion is the movement of soil by wind, water, or other natural actions. Natural erosion occurs on land not disturbed by humans. Accelerated erosion usually results from human activity on the land.

Four basic causes of erosion are wind, water, glacial movement, and land slippage. Wind erosion is the loss of soil due to the movement of wind over the land. Wind moves soil by suspension, saltation, and surface creep. Water erosion is the loss of soil due to water movement. Three types of water erosion are sheet erosion, rill erosion, and gully erosion. Glacial erosion occurs when the front edge of a glacier pushes soil, rocks, and other materials. Land slippage occurs when soil saturated with water slips down a hillside or mountain slope.

Soil erosion can be managed to reduce levels of soil loss in both urban and rural settings.

Checking Your Knowledge:



1. What is soil erosion?
2. What is the three-step process of erosion?
3. What are the types of wind erosion?
4. What are the types of water erosion?
5. What are some practices that can be employed to manage erosion?

Expanding Your Knowledge:



Contact your local soil conservation district and ask a representative to speak to your class about soil erosion. Be sure to have questions prepared regarding the causes of erosion and the methods to reduce erosion.

Web Links:



Erosion

<http://soils.usda.gov/technical/manual/contents/chapter3b.html>

Soil Erosion Site

<http://www.soilerosion.net/>

Soil Erosion

<http://www.nrcs.usda.gov/TECHNICAL/land/erosion.html>

Agricultural Career Profiles

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

Checking Your Knowledge:

1. What are the types of plants used for flower gardens?

2. What are some guidelines for using flowers in the landscape design?

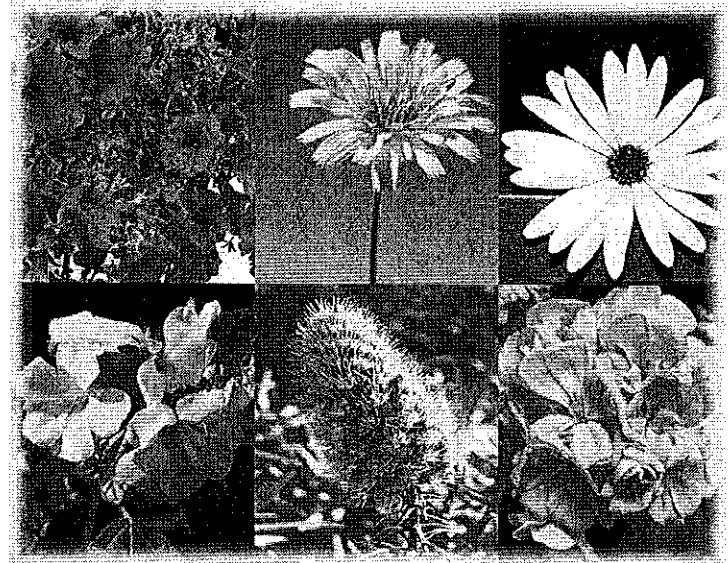
3. What is accent?

4. How do border gardens and island beds compare?

5. What is color rotation?

Using Annuals and Perennials in the Landscape

A SPLASH OF COLOR in the landscape provides interest and excitement. No wonder flower gardening is one of the most popular hobbies in the United States. Often the color is provided by the flowers or brightly colored foliage of annual and perennial plants.



Objective:



Explain how to use annuals and perennials in the landscape.

Key Terms:



- | | | |
|---------------|----------------------|------------|
| accent | bulbs | island bed |
| annual | color rotation | mulch |
| biennial | deadheading | perennial |
| border garden | herbaceous perennial | |

Using Flowers in the Landscape

Flowers add visual interest as well as fragrance to the garden. People enjoy the stimulation they provide. Some people put great effort into planning, installing, and maintaining their flower gardens.

TYPES OF FLOWERING PLANTS

When we speak of flowering plants, we are generally speaking of nonwoody plants. Flowering plants can be divided into three categories: annuals, perennials, and biennials.

Annuals

A plant that completes its life cycle within one year or one growing season is called an **annual**. People can purchase annuals as seed or as plants. Annuals are planted in the spring, bloom throughout the summer, and die with the coming of the frost. Common annuals are marigolds, petunias, impatiens, and geraniums.

Annuals can be used in the landscape for continuous color during the growing season. They can be placed around evergreen shrubs and on patios or decks. Annuals make wonderful window boxes and container plantings. Some annuals attract butterflies to the garden. Another use for these flowering plants is as cut flowers. The plants are grown in the garden, and the flowers are then harvested and brought indoors to be used in vases and other fresh arrangements.



FIGURE 1. Annuals make beautiful planter boxes.

Perennials

A **perennial** is a plant that has a life cycle of more than two growing seasons. A **herbaceous perennial** has soft tissue, unlike the woody tissue found in a tree or shrub. Perennials are usually placed in the garden as small plants. With proper care, they survive from year to year. Examples of perennials are peonies, irises, delphiniums, hostas, and daylilies.

Perennials have many of the same uses as annuals, but they don't always do as well in containers or window boxes. Perennials also have specific times when they bloom. Paying attention to the blooming season of perennials is important when selecting them for the garden. To maintain continuous color in the garden, select a variety of plants that bloom at different times.

Bulbs are a special category of perennials. In the horticulture industry, plants that have bulbs, corms, tubers, or rhizomes are often clumped together and called bulbs. Technically, **bulbs** are short, flattened stems that bear fleshy, food-storage leaves. Most bulbs are planted in

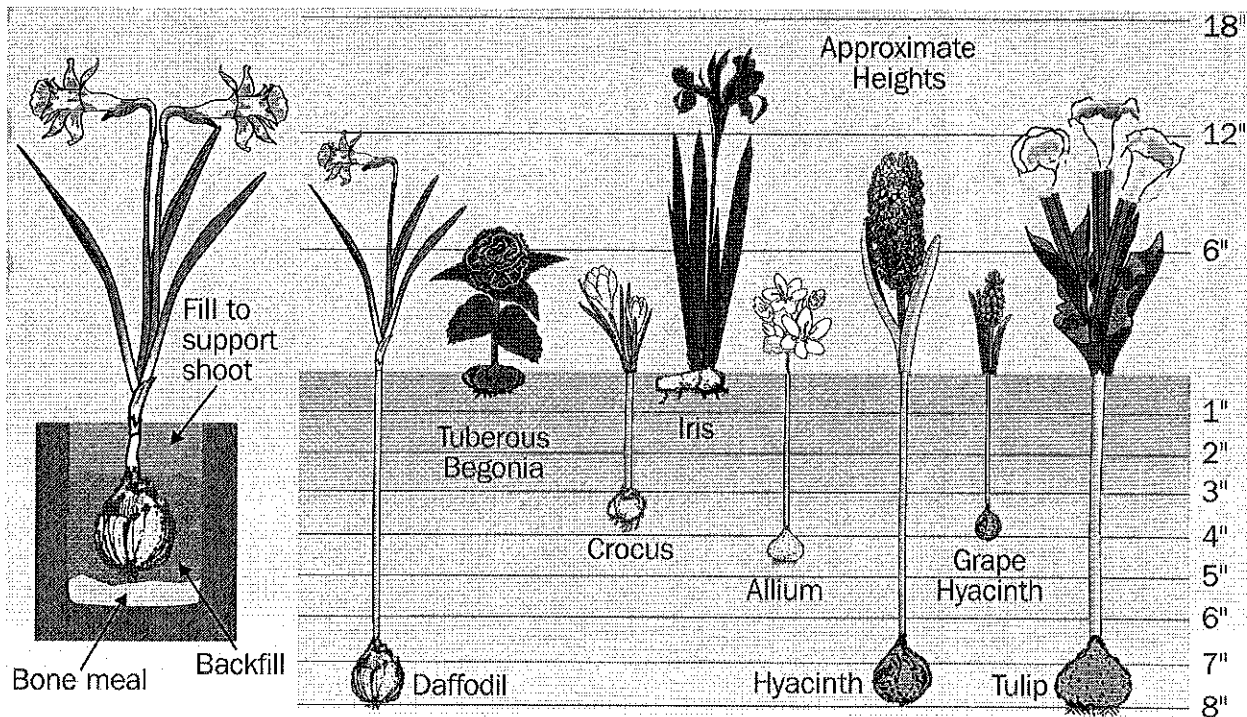


FIGURE 2. Planting technique for bulbs and tubers. Spring flowering bulbs can be planted from September through early November in sunny, well-drained locations.

the fall and flower the following spring. Examples are tulips and daffodils. A few bulbs, like gladiolas and tuberous begonias, are planted in the spring and flower in the summer.

Biennials

The third category of flowering plants is biennials. A **biennial** is a plant that normally requires two growing seasons to produce flowers and seed before dying. It grows foliage the first year and blooms the second year. Relatively few biennials are used in flower gardens. A couple examples of biennial plants are foxgloves and blackberry lilies.

DESIGNING WITH FLOWERS

Annuals and perennials have many uses in the landscape. When placed in the proper environment and given periodic maintenance, these flowering plants can become assets to any well-designed landscape.



FIGURE 3. Flower gardens are often used to add color and beauty to the private area.

Accent

Annuals and perennials provide an accent of color to the landscape. **Accent** is special emphasis provided by striking or prominent features of the landscape plants or structures. The bright flower and foliage colors are visually appealing. Because the colors attract the attention of the viewer, they must be used with caution.

A cardinal rule of landscape design is to treat the house as the most important feature of the landscape. Bright-colored flowers draw attention from the house. Flowers between foundation plants, lining driveways, and in island beds in the front lawn divert attention from the house and are considered poor design. A few flowers placed by the front door are acceptable, as the flowers help to call attention to the door. The best place for extensive use of flowers is in the outdoor living area.

In the outdoor living area, plant flowers in full view of the patio, deck, or interior rooms. Here, flowers can be enjoyed without detracting from the house.

When designing flower gardens, be careful not to overwhelm the viewer with color. Use the flowers to create high-interest areas within the design. Overuse of flowers disrupts the relaxing effect of the landscape achieved through the use of green plants.



FIGURE 4. This perennial flower bed provides enjoyment without detracting from the house.

Selecting Flower Species

Select annuals and perennials adapted to the growing conditions in the landscape. Two of the most critical environmental factors for growing flowers are the amount of sunlight and the amount of moisture. Be sure to check a reference to find out which plants prefer sun or shade and dry soils or moist soils. It is very important that the soil be in the right condition for perennials because these plants will stay in the garden for many years.

PLANNING A FLOWER GARDEN

The most important thing a gardener can do before actually planting a flower garden is to plan the garden on paper. By doing the design first, the gardener will save money by purchasing the correct type and number of flowers and will avoid the need to make changes to the garden later. The purpose of the garden and the location of the garden must be determined in advance. The gardener must evaluate the growing conditions in the garden. Then, plants can be selected to fit the design needs.

Guidelines for the Flower Garden

A flower garden can be a border garden or an island bed. A **border garden** is placed along a fence or a wall in the yard. It is usually viewed from only one side. An **island bed** is placed in the center of the yard, with the tall plants in the center of the garden and the shorter plants toward the outer edges.

Angled or incurved flower beds work best for designing a flower border. The bed pattern itself creates interest. Design the flower border to be no more than 5 feet in depth. This allows for easy maintenance and view of all the flowering plants.

In a border garden, the tall plants are placed in the back, with the shorter plants up front. The designer should be careful to avoid a stair-step look from the side of the garden. This can be accomplished by staggering the location of the various heights of plants.

Warm-color flowers are powerful and should be used sparingly in small landscapes, as they tend to close in on the viewer. Follow the sequence principle of design and select flowers with colors that will provide a smooth transition from one drift to the next. Place coarse-textured flowering plants at the ends to provide strength and to frame the flowers in the incurve.

Flowers are best used in combination with woody plants. Design flower borders to be planted in front of woody plant materials or physical structures, such as fences or walls. The woody plants with green foliage provide a backdrop for the flowers.

Plant the flowers in drifts of the same varieties. Drifts of color are bold in appearance and striking. Avoid mixing individual flower varieties and colors within a flower bed. The spattering of different colors in a flower bed has a busy appearance and is difficult for the viewer to process.



FIGURE 5. A vivid flower garden border.

Color Rotation

Flowers provide seasonal displays of color. Sometimes only a few months of color can be expected from a type of plant. Mix groups of annual flowers with groups of perennials to extend and enrich the floral display. The length of time a flower bed shows color can be extended by applying a color rotation strategy. **Color rotation** involves the cycle of several floral displays in one growing season. In spring, the flower bed may display flowers of spring-flowering bulbs, such as tulips, narcissus, and hyacinths. When the bulbs finish flowering, they are replaced with annuals, such as petunias, marigolds, and impatiens. A third planting occurs as temperatures drop in the fall. The fall bed might display chrysanthemums or ornamental cabbage.

Maintaining Flowers

To keep annuals and perennials looking their best, it is important to maintain them. Flower gardens need to be watered, weeded, and mulched. **Mulch** is a material placed around the flowers to help maintain moisture and keep the soil temperature uniform. Examples of mulch are pine bark chips and acorn hulls. Pest problems can be reduced by starting with disease- and insect-free plants and placing them in the correct growing environment. The appearance of the flowers can be improved through a practice called **deadheading**, in which the spent flowers are removed. The flowering of many perennials declines as they become overgrown. Many perennials benefit from division every three to five years to prevent their becoming overgrown.

Summary:



Flowering plants can be divided into three categories: annuals, perennials, and biennials.

Annual and perennial flowers provide an accent of color to the landscape. Bright-colored flowers draw attention from the house; therefore, extensive use should be restricted to the outdoor living area.

Select annuals and perennials adapted for the growing conditions in the landscape.

The most important thing a gardener can do before actually planting a flower garden is to plan the garden on paper.

A flower garden can be a border garden or an island bed. A border garden is placed along a fence or a wall in the yard. An island bed is placed in the center of the yard, with the tall plants in the center of the garden and the shorter plants toward the outer edges.

Color rotation involves the cycle of several floral displays in one growing season.

Flower gardens need to be watered, weeded, and mulched.

Checking Your Knowledge:



1. What are the types of plants used for flower gardens?
2. What are some guidelines for using flowers in the landscape design?
3. What is accent?
4. How do border gardens and island beds compare?
5. What is color rotation?

Expanding Your Knowledge:



Design a flower border to scale for your home. Follow guidelines discussed in this unit to select and locate the various plant species.

Web Links:



Landscaping with Flowers

http://72.14.203.104/search?q=cache:AzUYf_8i_9AJ:extension.unh.edu/pubs/HGPubs/landflwr.pdf+landscaping+with+flowers&hl=en&gl=us&ct=clnk&cd=1

Flowers for All Seasons

<http://aggiehorticulture.tamu.edu/extension/homelandscape/flowers/color.html>

Flower Garden Design Basics

<http://www.gardening.cornell.edu/homegardening/scene74a6.html>

Flower Bed: Planning the Flower Border

<http://cals.arizona.edu/pubs/garden/mg/flower/planning.html>

Agricultural Career Profiles

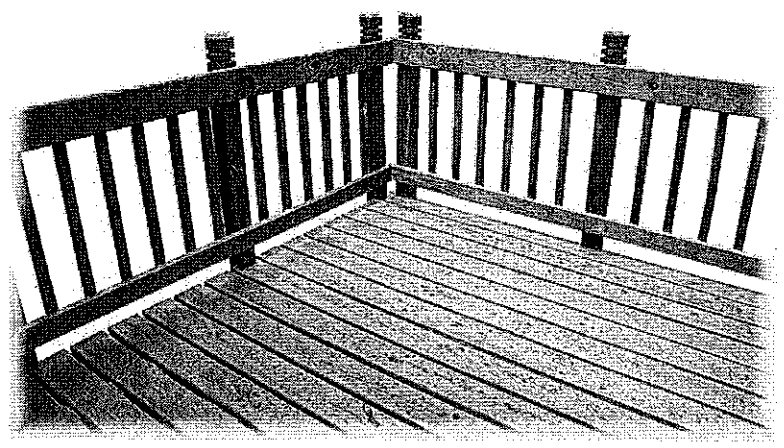
<http://www.mycart.com/career-profiles>

Checking Your Knowledge:

1. What is paving?
2. How do hard paving and soft paving compare?
3. What are the major steps in installing a concrete patio or walk?
4. What are the major steps in installing a paver patio or walk?
5. What are the major steps in installing a deck?

Installing Patios, Walks, and Decks

TIMES have changed. During much of the history of the United States, people sat on their front porches to relax and socialize with neighbors. That is no longer the case. Today, people spend more of their leisure time at the back of their houses on patios or decks.

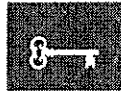


Objective:



Explain techniques used to install patios, walks, and decks.

Key Terms:



- | | | |
|------------|-------------------|-------------|
| bull float | exposed aggregate | paving |
| cubic yard | forms | screed |
| curing | hard paving | screeding |
| deck | patio | soft paving |

Paving for the Residential Landscape

Covering soil with a surfacing material to prevent soil erosion, prevent compaction from traffic, and improve walking ease is called **paving**. There are many kinds of paving materials. Selection of a material depends on its cost, availability, and suitability.

A **hard paving** material has a definite form and is solid underfoot. Hard paving has advantages, including durability, strength, and low maintenance. Negatives include price, which can be significant, and difficulty of installation. Some hard paving materials have additional liabilities, such as being slippery when wet or getting too hot during the middle of the day. Hard paving materials include concrete, brick, pavers, wood, and flagstone. Recycled plastic materials molded and dyed to look like wood are gaining in popularity.

Holt B-# #3

A **soft paving** material lacks a solid form but still provides soil coverage. While soft paving can be very durable, more maintenance is usually needed to keep it looking good. Soft paving is best for children's play areas and areas that receive little traffic. It can also be used as a temporary soil covering until a more permanent treatment is installed. Soft paving materials include wood or bark chips, gravel, and ground-up rubber.

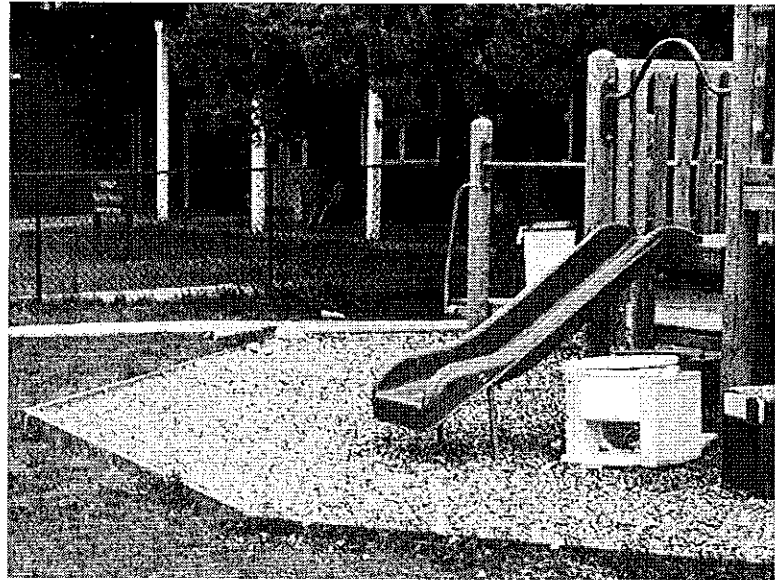


FIGURE 1. A playground covered with wood chips.

PATIOS AND DECKS

Patios and decks are extensions of the indoor living spaces and are used for cooking, entertainment, and play. They are usually the largest paved surfaces in the outdoor living area.

A **patio** is a hard, permanent surface that is level with the ground. A hard paving material is used for a patio because of the amount of traffic and use of the surface. Hard paving is easier to walk on, easier to clean, and easier to keep up. Price, use, shape of patio, durability, and grade of site can all affect the choice of surfacing material.

A variety of materials are used for patios. A frequent choice for patios is concrete. It is very durable and easy to keep up. Concrete can be tinted to add interest to its appearance. Paver blocks are similar in appearance to bricks and are a common choice. Paver blocks are made of compressed concrete. They are available in a variety of colors. Paver blocks are very durable and attractive. Flagstone and slate are other options that provide different looks in a landscape.

A **deck** is a surface raised above the ground level. Cedar, wood treated to resist decay, and plastic materials are used for decks. Wood decking is the most common. Wood has the benefits of flexibility, ease of construction, moderate price, and attractive appearance. However, wood decks need regular maintenance and have a limited life span.



FIGURE 2. A deck is often viewed as an extension of the indoor living space.

INSTALLING A WALKWAY OR PATIO

Some landscapers prefer to subcontract the installation of walkways or patios to businesses that specialize in such work. This is frequently true with concrete and asphalt work because of the labor and equipment needed. Proper installation of a hard paving surface requires knowledge and experience.

Concrete Surfaces

Concrete walks and patios are the most popular because of their ease of installation, ease of use, and ability to have any desired shape. Concrete is composed of cement (which acts as a glue), gravel, and sand.

Site preparation is important. The first step in working with concrete is to remove turf and then excavate to a depth of 6 inches. A 2-inch base of crushed gravel or rock dust is added, then compacted, to form a solid underfooting for the concrete.

The next step is placing the forms. **Forms** are the wooden boards or plastic molds used to hold the liquid concrete until it sets. Most forms are 2" × 4" boards or flexible Masonite set so that the top edge of the material is at the proper height for the final surface (usually 3½ to 4 inches deep). Steel or wood stakes are used to hold the forms in place. The forms for a patio should be installed so the final surface has a 2 percent slope away from the building.

Most towns have ready-mixed concrete available from construction providers. Concrete is ordered by the number of cubic yards needed. A **cubic yard** is a volume 3 feet long by 3 feet wide by 3 feet high. To find the number of cubic yards needed for a patio, multiply the length by the width to get the square feet. Then divide the answer by 80, which is a constant that represents the depth required for most installations.

Ready-mixed concrete comes in different blends depending on the proposed use of the concrete and its exposure to the elements. When ordering, be sure to know how much will be needed and what use and what exposure your patio or walk will receive.

Concrete has a tendency to crack. To deal with this problem, many contractors will add either steel reinforcing mesh to concrete that is to be 4 inches or more in thickness or polypropylene fibers to the mix. Also, joints should be cut into the concrete to "guide" the cracking process.

Ready-mixed concrete will be delivered to the site by a cement truck. Use shovels to move the poured concrete and to fill the forms. The concrete will need to be leveled using a **screed**, or a straightedge. **Screeding** is a leveling process in which a straightedge is dragged across the concrete surface while resting on the edges of the forms. High spots are lowered, and low spots filled.

Once the concrete begins to harden, a **bull float** is used to work the aggregate down into the cement and to smooth the surface. A broom is dragged over the concrete to create a rougher surface, which makes the concrete less slick when wet. The concrete should be scored to create joints. Usually, a finisher is also used at this time to create a smooth edge on the outside next to the forms.

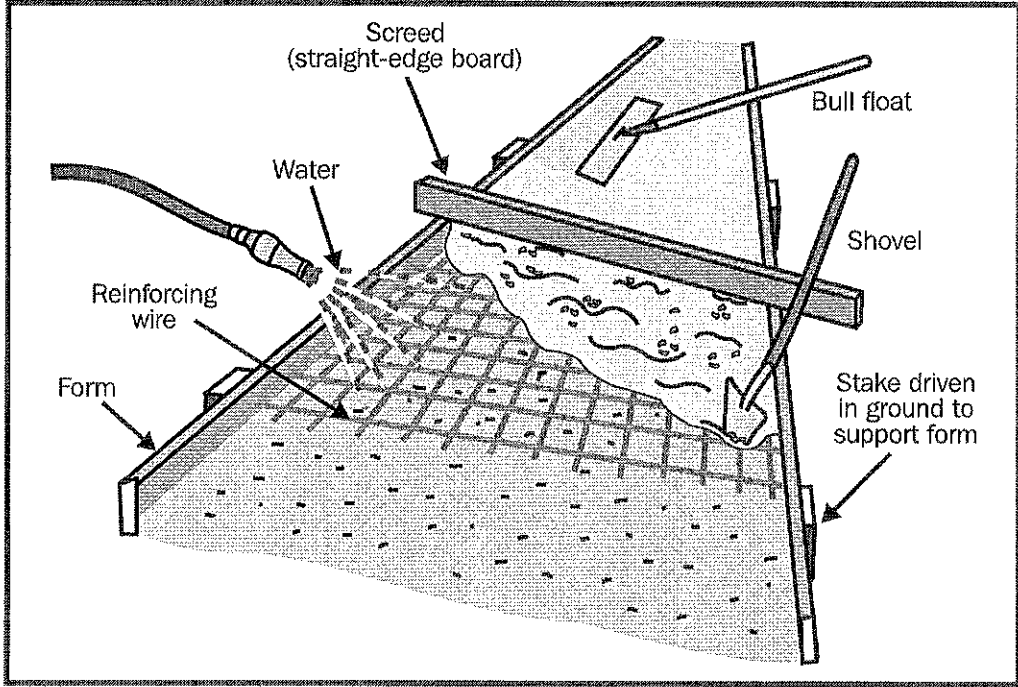


FIGURE 3. Procedures for placing a concrete walk.

Sometimes, a rustic or textured appearance is desired. This can be accomplished by hosing off the top layer of concrete, leaving **exposed aggregate** on the surface of the patio or walkway.

Curing is the process of concrete hardening or setting. The slower the curing process, the stronger the concrete. Concrete is often covered with plastic sheeting or burlap or is sprayed with a retardant to slow the curing process. Many smaller installations are sprayed with Cure and Seal™, a type of plasticized spray that works like plastic sheeting. Concrete goes through three stages of curing, the first taking just a few hours. The second curing takes two to seven days, depending on temperature and humidity, after which the concrete can handle light traffic. A full period of 28 days is needed for concrete to reach its maximum strength.

Brick Paver Surfaces

Pavers also make excellent walkway or patio surfacing. Paver-block installation shares some commonalities with concrete installation. Steps to installing a paver surface follow.

1. Excavate the area to a depth of 7 inches.
2. Add a 2½-inch base of crushed gravel or rock dust. Run a plate compactor over the gravel to compact it and form a solid underfooting for the pavers.
3. Cover the gravel with a layer of landscape fabric to reduce frost heaving.
4. Install edging to prevent shifting or movement of the pavers. Edging may be steel, aluminum, plastic, railroad ties, or landscape timbers.
5. Apply a 2-inch layer of construction sand and level it with a screed.

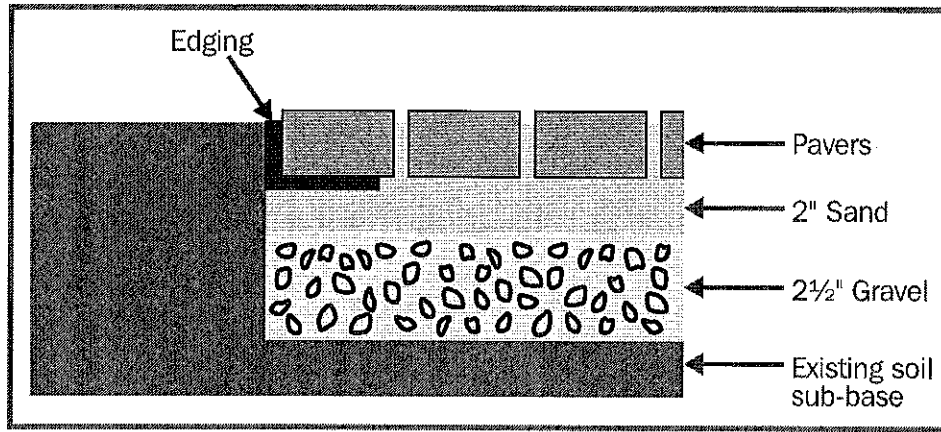


FIGURE 4. Cross section of paver installation technique.

6. Lay the pavers, starting in a corner. Use a masonry saw or brick chisel if cutting of pavers is necessary.
7. Fill joints with coarse construction or torpedo sand by sweeping the sand across the cracks. Operate a plate compactor over the pavers to set the pavers and to settle the sand between the joints. Sweep more dry sand into the cracks. Repeat. Rinse off excess sand with a gentle spray from a garden hose to finish.

INSTALLING A DECK

Decks have a flexibility that allows them to be used for all sorts of irregular installations, such as on hillsides, around mature trees, and to accommodate level changes between the house and the yard.

The choice of building material is important when building a deck. Woods, such as cedar, redwood, and baldcypress, are naturally resistant to decay. However, they are expensive and ecologically sensitive choices. Alternatives include pine that has been Wolmanized™, or treated with chemicals, to make it more rot resistant. Treated lumber is available in a green finish or a more expensive brown finish. If treated lumber is selected, certain safety precautions must be followed, as it can be hazardous to human health when cut and handled.

Site preparation for a deck begins by removing turf and putting the support posts in place. Support posts are usually 4" × 4" or 6" × 6" pieces of treated lumber. They are placed in holes that extend below the local frost line. The posts are checked for plumb, and the holes are then filled with dry premixed concrete and allowed to set.

Beams are used to connect the support posts and hold the deck joists in place. They consist of 2" × 8" or 2" × 12" boards. Beams are connected using lag bolts. Joists run at a right angle to the beams and are on a 16-inch center, unless local zoning or uses of the deck dictate otherwise.

Deck boards are used to create the floor. They cover the joists. Most deck boards are 2" × 6" or 1 1/4" × 6". They often have eased edges for a more attractive appearance. Deck boards are attached using 16d (16-penny) deck nails or bugle-head screws. The boards should be spaced

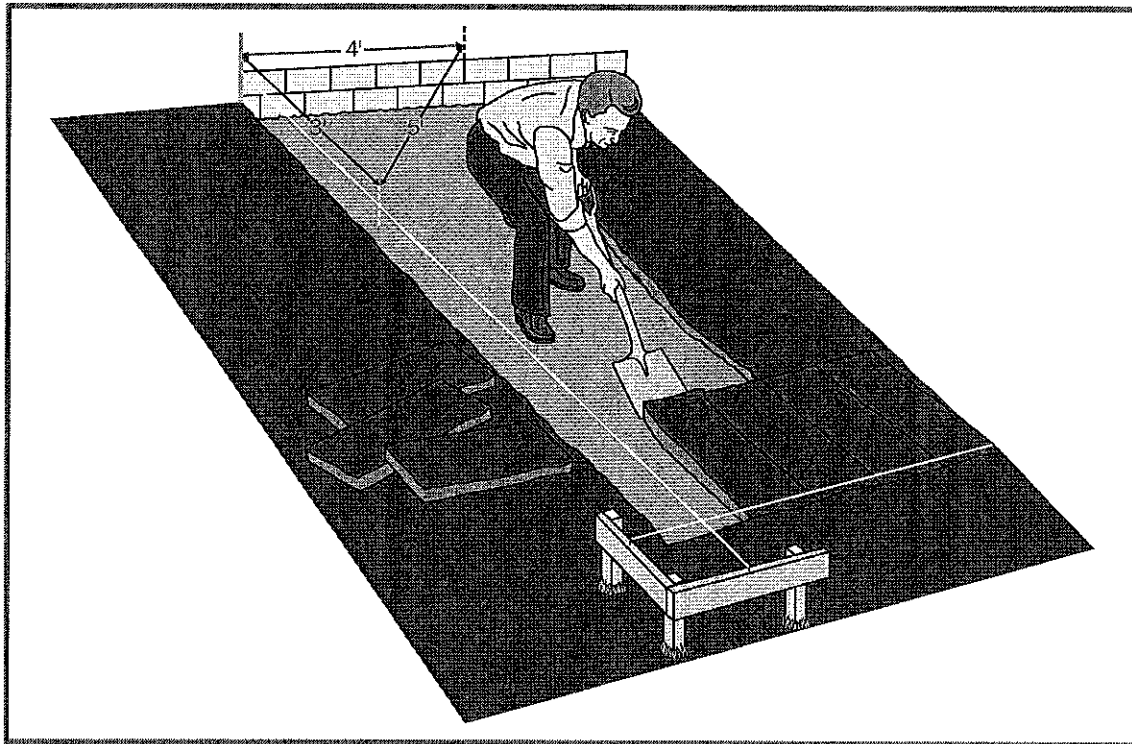


FIGURE 5. Layout and site preparation for deck or patio construction.

$\frac{1}{8}$ to $\frac{1}{4}$ inch apart to allow for the effects of weather changes on the wood and to facilitate water drainage. Board ends should be staggered for strength and visual appeal. Once installed, the lumber should be trimmed along the outside edge for a neat appearance.

Posts need to be installed for a railing if the support posts are not being used for the job. Most railings are installed at a height of 36 inches above the deck surface. Vertical pieces of wood called balusters are added between the top and bottom rails. Most balusters are placed on 6-inch centers, but other widths can be used for more dramatic effects.

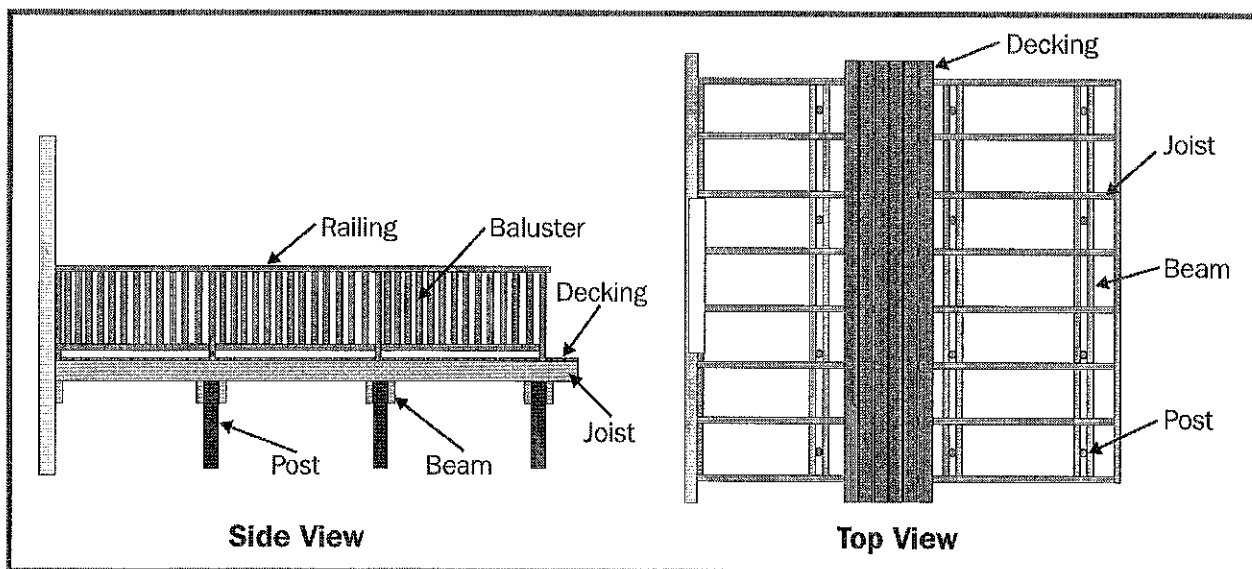


FIGURE 6. Parts of a deck.

Summary:



Covering soil with a surfacing material is called paving. A patio is a hard, permanent surface that is level with the ground. A deck is a surface raised above the ground level.

The site for concrete is prepared by excavating soil and making a solid underfooting. Forms hold the liquid concrete. The concrete is leveled using a screed. A bull float is used to work the aggregate into the cement and smooth the surface. Curing is the hardening of concrete.

Paver installation requires excavation and the preparation of a base. Edging prevents shifting of the pavers. Pavers are laid starting in a corner. Joints are filled with coarse sand. A plate compactor is run over the pavers to set them.

Deck support posts are placed first. Beams are used to connect the support posts and hold the deck joists in place. Deck boards create the floor. Railings and balusters are added.

Checking Your Knowledge:



1. What is paving?
2. How do hard paving and soft paving compare?
3. What are the major steps in installing a concrete patio or walk?
4. What are the major steps in installing a paver patio or walk?
5. What are the major steps in installing a deck?

Expanding Your Knowledge:



Calculate the materials needed to install walks, patios, or decks you have designed on a landscape plan. Install a walk, patio, or deck following steps discussed in this unit.

Web Links:



Landscape Construction

<http://aggie-horticulture.tamu.edu/extension/homelandscapes/construct/construct.html>

Decking Lumber Options

<http://web.utk.edu/~mtaylo29/files/Decking%20Lumber%20Option.pdf>

Patios and Walkways

http://www.luckstone.com/arch/brochures/images/pdfs/DIY_Patios_Bro.pdf

Agricultural Career Profiles

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