NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE SPECIFICATION

MULCHING

(Ac.)
CODE 484

PURPOSE OF SPECIFICATION

This Specification provides guidance for the installation of the practice Mulching. Guidance may include information about applying different methods listed in the Conservation Practice Standard, details of site preparation and protection, instructions for use of materials described in the Standard, and other information not directly addressed in the Standard.

Specifications for the installation, operation and maintenance of the practice shall be prepared for each treatment unit in accordance with the requirements in the Conservation Practice Standard and the guidance in this Specification. The site specifications shall be recorded in the Conservation Practice Jobsheet and given to the client.

INSTALLATION PROCEDURES

Organic Mulches

Organic mulches, which are derived from living sources, will be free of weeds, any live vegetative reproductive part(s), and seed sources.

Apply coarse mulches such as chipper materials (mixture of bark, chips, and leaves), macadamia nut shells and husks, and wood chips 3 to 4 inches deep on well drained soils. Determine if the soil map unit is well drained using the Soil Data Viewer; select the report for Brief Map Unit Description report.

Compost can be used as mulch, although it best used as a soil conditioner. If used, it should be applied 3 to 4 inches deep on well drained soils.

Lawn clippings should be dried for at least a day before using and applied 1 to 2 inches deep. Note that the clippings may contain pesticides and also grass stolons which may root and grow.

Apply very fine mulches, such as sawdust or wood shavings, to a maximum depth of 1 inch. Very fine mulches applied in a thick layer will cause the fine particles to settle together and reduce infiltration of water and air.

Apply 0.5 pounds of 10--10--10 fertilizer per cubic yard of fine or very fresh mulch (when the carbon to nitrogen ratio exceeds 20:1) to prevent excessive tie up of soil N.

Note that saw dust and wood shavings are a possible fire hazard and are easily wind blown.

Hay and straw for erosion reduction should be applied at a minimum rate of 2 tons per acre or to a depth of 3 to 4 inches. This rate will provide the most reduction in soil erosion per ton of material applied. See the Agronomy Technical Note Number 2, *Mulches for Critical Areas* for more information. Approximately 70% of the surface will be covered at the 2 ton per acre rate. Applying more than 2 tons per acre of hay or straw can restrict seedling growth.

Typically, an eighty-pound bale of straw will cover a little less than 900 square feet when applying it at a rate of 2 tons per acre.

Till the soil so the top 4 inches are conducive to anchoring the hay or straw. Apply the hay or straw with a blower or spread by hand. Set the blower adjustment to maintain long stems. Spread the hay or straw evenly across the soil surface.

Anchor the hay or straw by using a tractor-drawn mulch crimper or a very dull disk set in a line running parallel to the tractor movement. Another option is to use tracked equipment to run over the straw and crimp the straw into the soil. All equipment should be operated cross-slope.

For smaller applications, the hay or straw can be anchored with a dull shovel. A sharp shovel will only cut the straw.

Chemical tacking agents can also be sprayed over the hay or straw with a special sprayer to help hold it in place. See also the following section on Hydromulching.

Newspaper or cardboard is sometimes used as mulch for moisture conservation. Newspaper should be applied 3 to 6 sheets thick and cardboard 1 layer thick. Note that glossy surfaces and colored print should be avoided and any ink print may contain heavy metals like Pb and/or Cd.

Plastic Film

The plastic film used as mulch is made of polypropylene, is nonporous, and usually come in long sheets on a roll. The life span of the plastic film should be noted when selected type to use. Photodegradable types are available.

Black plastic film mulch is commonly used by vegetable and pineapple growers for weed control. This type of mulch should be installed according to the manufacturer's recommendations and/or installation instructions. This type of mulch is usually mechanically laid on the soil surface. A disk on both sides of the roll opens a furrow in the soil and a packer wheel in the back of the roll anchors the plastic mulch.

Plastic film mulches will be installed on the contour or cross slope.

Erosion Control Mats

Erosion control mats or blankets can be made of coconut fiber, polypropylene, straw, and burlap. These types of mats are usually porous and commonly used for erosion control on slopes.

A major cause of failure for erosion control mats occurs when water flows between the soil surface and the mat. Thus, the contact between the mat and the soil surface must be maximized. The soil must be graded to create an interface between the mat and the soil surface that is generally free of ruts and rills.

The mat must be anchored onto the soil at the very top and bottom slopes of the treatment area. The anchoring trenches are typically 6 inches wide and 12 inches deep. The edges of the mat are placed in the trenches and covered with soil. Intermediate anchoring trenches or staples should be installed cross-slope at intervals per the manufacturer's installation recommendations and/or instructions.

Woven Weed Barriers

Woven weed barriers look like woven fabric and are usually made from natural materials which photodegrade. Selection of the type of woven weed barrier to use should consider the product life span and the specific need.

This type of weed barrier will allow infiltration of water, but will not allow sunlight through, preventing weed growth.

Weed barriers typically comes in rolls of 300 to 750 foot lengths. The most common roll width is 6 feet. The longer the roll, the more cumbersome it will be to install.

Weed barriers are also available in squares, which can be use on small jobs.

Mow or herbicide weeds to allow the weed barrier to lay flat on the soil. Prepare the soil by chiseling, disking and rototilling to remove clods or sod. Bury (with soil) or staple the edges to prevent the weed barrier from blowing. If using staples, follow the manufacturer's recommendation.

Cover the beginning of the roll with 6- 10 inches of soil, usually digging a small trench and burying the fabric will suffice. Someone may have to stand on the edge of the fabric to act as an anchor during the initial installation.

Refer to the product's installation guide for details. For additional information, refer to Vegetative Technical Note Number 5, *Weed Barrier Fabric Mulch for Tree and Shrub Plantings.*

Hydromulching

Hydromulching involves spraying liquid slurry on the soil surface. If the slurry includes a fiber matrix, as well as a tackifier and water, it will act as mulch by itself. Slurry of just tackifier and water is sometimes sprayed over other types of mulch materials, such as hay or stray, to help "glue" it on to the soil surface.

Because hydromulching requires the use of special equipment for installation a commercial applicator is usually hired.

TYPICAL DENSITY OF PRODUCTS

Generally, products like compost, wood chips and cinders are sold on the cubic yard basis. If the product is sold by weight, ask the supplier for the density of the material. Wood chips can vary from 0.3 tons per cubic yard to 0.5 tons per cubic yard. Cinders can range from 0.75 to 1 ton per cubic yard. Rock or gravel material usually ranges from 1.2 to 1.4 tons per cubic yard.

REFERENCES

Atchison, R. L., Ricke, L. B. 1996. *Weed Barrier Fabric Mulch for Tree and Shrub Plantings.* Kansas State and Extension Forestry, Kansas State University.

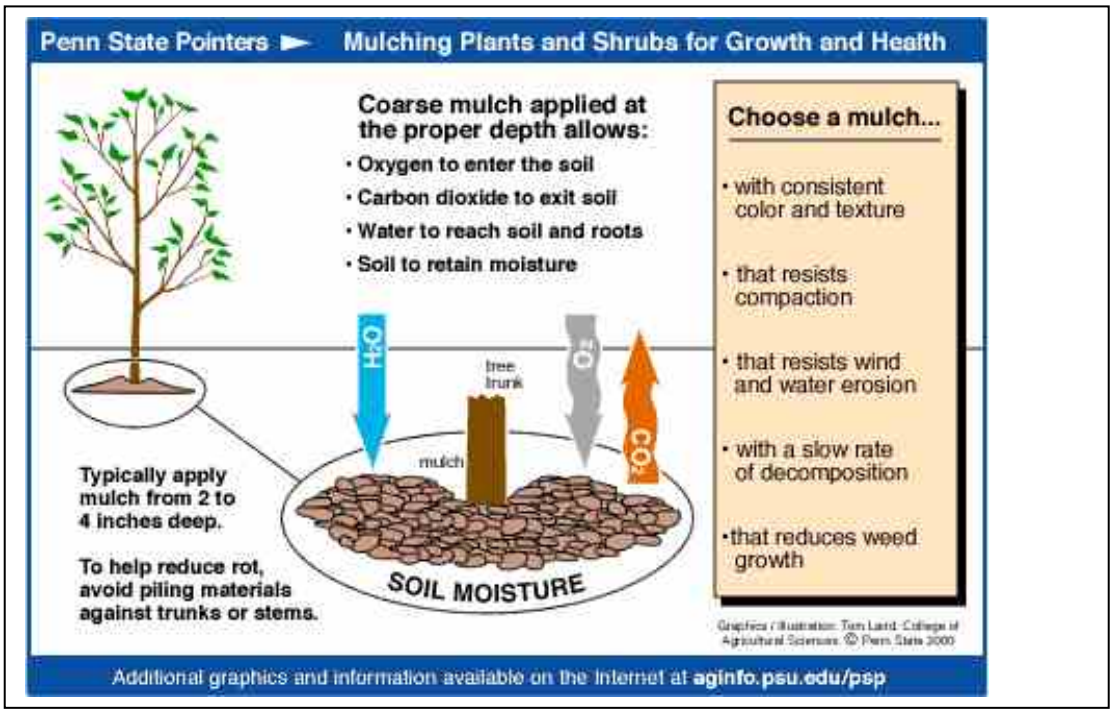
Dickerson, G. W. 1998. *Mulches for Gardens and Landscapes*. College of Agriculture and Home Economics, New Mexico State University.

Meade, G., Hensley, D. L., 1997. *Mulching for Healthier Landscape Plants*. Landscape Series, number 3, Cooperative Extension Service, College of Tropical Agriculture and Human Resources. University of Hawaii.

Common Mulch Materials

(Materials are not limited to this list. Call the appropriate specialist for additional information.)

Material	Typical Application (thickness/ layers) for well drained soils	Typical Life Span of Material	Notes
Burlap	1 layer	6+ months	
Chipper materials (mixture of bark, chips, leaves)	3-4 inches	6-9 months	
Cinder, gravel	3-4 inches	1-2 years	Crushed coral can increase soil pH over time.
Compost	3-4 inches	6-8 months	Best used as soil conditioner instead of mulch.
Hay or straw	3-4 inches (2 tons)	3-6 months	Anchor w/ staple or dull shovel, dull disk or tackifier.
Lawn clipping	1-2 inches	1-3 months	Dry for a day before using. If stolons are part of the mixture, it might grow. May contain pesticides.
Macadamia nut husks and shells	3-4 inches	8-10 months	
Plastic film	1 layer thick	10-36 months	Check product for lifespan. Photodegradable plastic available.
Paper	Newspaper-3-6 sheets thick Cardboard-1 layer thick	2-6 months	Avoid glossy and colored prints. May contain heavy metals like Pb and/or Cd.
Woven weed barrier	1 layer	3-5 years	Check product for lifespan.
Saw dust, wood shavings	1-2 inches	4-6 months	Possible fire hazard, easily wind blown.
Wood chips	3-4 inches	6-9 months	


Penn State Pointers
Mulching Plants and Shrubs for Growth and Health
Coarse mulch applied at the proper depth allows:
• Oxygen to enter the soil
• Carbon dioxide to exit soil
• Water to reach soil and roots
• Soil to retain moisture
Choose a mulch...
• with consistent color and texture
• that resists compaction
• that resists wind and water erosion
• with a slow rate of decomposition
• that reduces weed growth
H2O
O2
CO2
tree trunk
mulch
SOIL MOISTURE
Typically apply mulch from 2 to 4 inches deep.
To help reduce rot, avoid piling materials against trunks or stems.
Additional graphics and information available on the Internet at aginfo.psu.edu/psp