

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

MULCHING

(Acre)
CODE 484



DEFINITION

Applying plant residues, by-products or other suitable materials produced off site, to the land surface.

PURPOSES

The purpose of this practice is to support one or more of the following:

- Conserve soil moisture.
- Moderate soil temperature.
- Provide erosion control.
- Suppress weed growth.
- Establish vegetative cover.
- Improve soil condition and increase soil fertility.

CONDITIONS WHERE THIS PRACTICE APPLIES

This practice applies to all lands where mulch is needed. This practice may be used alone or in combination with other practices.

CRITERIA

General Criteria Applicable To All Purposes Stated Above

The selection of mulching materials will depend primarily on site conditions and the material's availability. Mulch materials shall consist of natural and/or artificial materials such as plant residue, wood bark or chips, by-products, gravel, plastic, fabric, animal manure, rice hulls, and materials from food processing plants or other equivalent materials of sufficient dimension (depth or thickness) and durability to achieve the intended purpose for the required time period.

Mulching is generally performed after grading, soil surface preparation, and seeding and plantings are complete. Soil surface shall be prepared in order to achieve the desired purpose.

The mulch material shall be evenly applied and anchored to the soil. Tackifiers, emulsions, pinning, netting, crimping, or other acceptable methods of anchoring will be used if needed to hold the mulch in place for specified periods.

Manufactured mulches shall be applied according to the manufacturer's specifications.

Mulching operations shall comply with federal, state and/or local laws and regulations during the installation, operation and maintenance of the practice.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Mulch material shall be relatively free of disease, noxious weed seeds, and other plant pests and pathogens.

Impact to cultural resources, wetlands and Federal and State protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida NRCS policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190-Parts 410.22 and 410.26), and National Planning Procedures Handbook (NPPH) FL Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), and The National Environmental Compliance Handbook (NECH).

Additional Criteria To Conserve Soil Moisture

Mulch reduces evaporation from the soil surface. As a result, a more uniform soil moisture regime is maintained and the frequency of irrigation is reduced. Irrigation is still mandatory for mulched crops so that the soil under the mulch doesn't dry out excessively. An irrigation water management plan shall be developed in accordance with Florida NRCS conservation practice standard Irrigation Water Management, Code 449.

Mulch materials applied to the soil surface shall provide at least 60 percent cover to reduce potential evaporation.

Mulch material shall be applied prior to moisture loss. Prior to mulching, ensure soil under shallow rooted crops is moist, as these crops require a constant supply of moisture.

Additional Criteria To Moderate Soil Temperature

A more uniform soil temperature can be maintained by mulching. The mulch acts as an insulator that keeps the soil cool under intense sunlight and warm during cold weather.

Mulch materials shall be selected and applied to obtain 100 percent coverage over the area treated. The material shall be of a significant thickness to

persist for the length of time required for the temperature modification.

Additional Criteria to Provide Erosion Control

When mulching with cereal grain straw or grass hay, apply sufficient amounts to provide 70 percent ground cover. Mulch rate shall be determined using current erosion prediction technology to reach the soil erosion control objective.

Cotton burs, peanut hulls, seed screenings, and other materials may be used where weed seeds are acceptable in the mulch. These materials shall not be used on slopes greater than 5:1. Mulch shall be evenly distributed at a rate which provides about 75 percent ground cover.

Commercial mulches including, but not limited to, jute mesh, excelsior mats, paper mesh or mats, wood cellulose mulch, synthetic fibers, and other similar materials may be used. Commercial materials shall be applied according to the manufacturer's recommendations.

When mulching with wood products such as wood chips, bark, shavings or other wood materials, apply to a 2-inch thickness if the soil is not well-drained and to a 3 to 4-inch thickness if the soil is well to excessively drained. More finely textured mulches, which allow less oxygen penetration than coarser materials, should be no thicker than 1 or 2 inches. The mulch material shall provide no greater than 80 percent ground cover in order to ensure adequate air exchange and drainage.

Gravel or other inorganic material shall be applied approximately 2 inches thick and shall consist of pieces 0.75 to 2 inches in diameter. The mulch material shall provide no more than 90 percent ground cover in order to ensure adequate air exchange and drainage.

Additional Criteria To Suppress Weed Growth

The thickness of mulch will be determined by the size of the plant being mulched. Small plants must not be smothered. Mulches shall be kept clear of the stems of plants where disease is likely to occur. Mulches applied around growing plants or prior to weed seedling development shall have 100 percent ground cover. Thickness of the mulch shall be adequate to prevent emergence of targeted

weeds. Plastic mulches may be used to address this criterion.

Additional Criteria To Establish Vegetative Cover

Mulch shall be applied at a rate that achieves 50 percent ground cover to provide protection from erosion and runoff and yet allow adequate light and air penetration to the seedbed to ensure proper germination, emergence, and disease suppression.

Additional Criteria To Improve Soil Condition and Increase Soil Fertility

Mulching will prevent crusting of the soil surface, thus improving absorption and percolation of water into the soil and, at the same time, reducing erosion.

Organic materials used as mulch can improve soil structure and tilth. As mulch decays, the material becomes topsoil. Decaying mulch may also add nutrients to the soil.

Fertilizer placed in the bed under the mulch is less subject to leaching by rainfall. As a result, the fertilizer program is more efficient and the potential exists for reducing traditional amounts of fertilizer.

To increase soil fertility, apply mulch materials with a carbon to nitrogen ratio (C:N) less than 30:1 such as animal manure, bio-solids, food processing wastes, or similar materials. Apply other practices such as contouring, filter strips or riparian forest buffers to assure that runoff from the mulched areas will not transport mulching materials to sensitive waterbodies. Do not apply mulch with C:N less than 20:1 to the area of designed flow in watercourses. Increased OM and resulting C will aid in the sequestration of nematodes.

Credit nutrients applied with the mulch to the nutrient budget.

Use the Soil Conditioning Index to assess soil quality impacts.

CONSIDERATIONS

Consider the effects of mulching on evaporation, infiltration and runoff. Mulch material may affect microbial activity in the soil surface, increase

infiltration, and decrease runoff, erosion, and evaporation. Increased infiltration may increase nutrient and chemical transport below the root zone. The temperature of the surface runoff may also be lowered.

Mulched soil retains moisture, requires less watering and reduces the chance of water stress on plant materials. Mulch also minimizes evaporation from the soil surface and hence reduces losses from bare soil areas.

Mulch materials high in organic matter with a high water holding capacity and high impermeability to water droplets may adversely affect the water needs of plants.

Clear and infra-red transmissible (IRT) plastics have the greatest warming potential. They are transparent to incoming radiation and trap the longer wavelengths radiating from the soil. Black mulches are limited to warming soils by conduction only and are less effective.

Clear mulches allow profuse weed growth and may negate the benefits of soil warming. Cover plastic film with a layer of mulch such as wood chips or pine needles to reduce heat absorption and to mask the artificial appearance of the plastic film. Plastic films are not recommended for poorly-drained areas. They may cause the soil to remain too wet, which could result in root disease problems. They are also not suited for steep slopes when an organic mulch is spread over the plastic, because rain water will wash the organic mulch away. Black mulches provide effective weed control. Wavelength selective (IRT) blends the soil warming characteristics of clear mulch with the weed control ability of black mulch.

Consider potential toxic allelopathic effects that mulch material may have on other organisms. Animal and plant pest species may be incompatible with the site. Highly reflective silver or metalized coatings on polyethylene have become important in North Florida and South Georgia as a method of reducing thrips and tomato spotted wilt virus in tomato crops. These mulches repel the tomato spotted wilt virus vectors, western flower thrips, (*Frankliniella occidentalis*) and the tobacco thrips (*F. fusca*).

Consider the potential for increased pathogenic activity within the applied mulch material.

Keep mulches 3 to 6 inches away from plant stems and crowns to prevent disease and pest problems.

Deep mulch provides nesting habitat for ground-burrowing rodents that can chew extensively on bark on tree trunk and/or tree roots. Light mulch applied after the first cold weather may prevent rodents from nesting.

PLANS AND SPECIFICATIONS

Specifications shall be prepared for each site, purpose of treatment, and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan or other acceptable documentation. Documentation shall include:

1. Type of mulch material used
2. Percent cover and/or thickness of mulch material
3. Timing of application
4. Site preparation
5. Listing of netting, tackifiers, or method of anchoring, and
6. Operation and maintenance plan

OPERATION AND MAINTENANCE

Mulched areas will be periodically inspected, and mulch shall be reinstalled or repaired as needed to accomplish the intended purpose.

Removal, incorporation, or bio- or photo-degradation of mulch and associated materials shall be consistent with the intended purpose and site conditions.

Operation of equipment near or on the site shall not compromise the intended purpose of the mulch.

Prevent or repair any fire damage to the mulch material.

Properly collect and dispose of artificial mulch material after its intended use.

Monitor and control undesirable weeds in mulched areas.

REFERENCES

- National Cultural Resources Procedures Handbook (NCRPH)
- National Environmental Compliance Handbook (NECH)
- NRCS General Manual (GM)
Title 190, Part 410.22-Procedures for NRCS Assisted Programs
Title 190, Part 410.26-Protection of Wetlands
Title 420, Part 401-Cultural Resources
Title 450, Part 401-Technical Guides
- National Planning Procedures Handbook (NPPH)
FL Supplements to Parts 600.1 and 600.6
- Florida NRCS conservation practice standards
Irrigation Water Management, Code 449
- UF-IFAS Fact Sheet ENH 103
UF-IFAS Circular 805
- Soil Conditioning Index