

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD AND SPECIFICATIONS**

**MULCHING**

(Acre)

CODE 484

**DEFINITION**

Applying plant residues or other suitable materials not produced on the site to the soil surface.

**PURPOSE**

This practice may be applied as part of a conservation management system to support one or more of the following:

- \* Protect vegetative cover or crops during establishment period.
- \* Reduce erosion and weed competition on disturbed areas.

**CONDITIONS WHERE PRACTICE APPLIES**

On soils subject to erosion on which low-residue-producing crops, such as grapes and small fruits, are grown; on critical areas; on newly seeded areas; and on soils that have low infiltration rate.

**CRITERIA**

**General Criteria Applicable to All Purposes Stated Above**

Common mulch materials such as straw or hay as shown in Table 1 shall be used. The mulch material shall be air-dry, reasonably light in color, and shall not be musty, moldy, caked or of low quality. The use of mulch that contains noxious weeds will not be permitted.

Manufactured mulch materials shall conform to the requirements shown in Table 1. These mulch materials will be applied according to this standard and the manufacturer's recommendations.

Asphalt spray (emulsions) will not be used to anchor mulch in areas receiving concentrated water flows. The use of this anchoring method

will be confined to areas that are steep and not accessible to field machinery. The material used shall be non-toxic to plant and animal life.

Runoff water from areas above that to be mulched will be diverted before mulch is applied unless otherwise approved by site specific recommendations. All needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins will be installed prior to mulching.

All areas to be mulched shall be shaped to planned grades, be reasonably smooth, be free of rills and gullies, and be graded to provide surface drainage. Any land preparation will be across the slope and on the contour where feasible.

Mulch may be applied to both planted and unplanted areas. Mulch materials will be applied by any method that will result in a uniform application on the soil surface. Manufactured mulch materials will be applied evenly and according to manufacturer's recommendations.

When required by site specifications, mulch tackifiers, binders, mesh and netting will be used to help anchor mulch materials. Mulch tackifiers and binders will be applied uniformly over the mulch material at the specified rate or injected into the mulch material as it is being applied. Mesh or netting will be applied smoothly and tightly to ensure adherence to the surface contours on the designated areas. The edges of these materials will be buried or securely anchored by means of spikes or staples. Refer to Table 2 for manual and mechanical methods of adequately anchoring mulch.

Conservation practice standards are reviewed periodically. To obtain a current version of this standard contact the Natural Resources Conservation Service.

**NRCS, Missouri  
June 2002**

**Additional Criteria to Protect Vegetative Cover or Crops during Establishment Period**

If the area to be mulched is to be seeded, follow seeding recommendations in appropriate standard for establishing vegetation. Seeding will be completed prior to the application of mulch. Mulch shall be applied within 48 hours after planting on gently sloping lands.

When fertilizer has been applied according to soil test recommendations, apply at least 20 pounds of extra nitrogen per ton of organic mulch used to compensate for nitrogen tie-up. When the fertilizer rates of the CRITICAL AREA PLANTING (342) standard are used, additional nitrogen is not required.

**Additional Criteria to Reduce Erosion and Weed Competition on Disturbed Areas**

Mulch is applied to unseeded areas to provide temporary protection over winter or until final grading and shaping can be accomplished. Mulch will be applied to completed sites before seeding if completion of earthwork occurs at other than favorable seeding dates or if the permanent seeding is delayed for more than 30 days.

**CONSIDERATIONS**

Mulch is very beneficial in conserving moisture, dissipating energy from falling rain, and insulating against temperature changes. Heavy mulching will suppress germination of weeds and desired species. Mulching materials ultimately improve soil structure and may add to fertility. Consider mulching materials that return the most benefit.

Mulches should be anchored during or immediately after application on all slopes which are 3:1 (horizontal to vertical) or steeper. On sites where equipment can not safely operate, anchoring work will be done by hand.

Mulching areas that receive concentrated flow may require a combination of straw or hay mulch held in place with mesh or netting. Apply the mulch and anchor with a crimping device prior to covering with mesh or netting.

During wet periods when the soil surface is very moist, mulch may encourage damping-off, a fungal disease. Do not mulch if the soil surface is saturated; allow the surface to dry.

Do not mulch wet, low-lying areas where ponding may occur. If mulching is necessary due to environmental concerns, use a light dry material that will float. Heavy mulch materials will mat and add to the wetness of the site.

Thick layers of mulch restrict plant germination. Avoid applying straw and hay mulch in depths exceeding two inches unless weed control is the primary concern. Heavy grass mulches at depths less than two inches may restrict plant germination.

Natural mulching materials used to control competing vegetation around newly planted trees may attract rodents such as mice and voles. This may increase possibility of damage to seedlings if the mulch material is in contact with the trunk.

**PLANS AND SPECIFICATIONS**

Specifications for this practice shall be prepared for each site. Site specifications shall be prepared using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation. Requirements for operation and maintenance of the practice shall be incorporated into site specifications.

Applicable mulch materials, quality, methods, and rates of application are given in Tables 1 and 2 of this standard.

**OPERATION AND MAINTENANCE**

Inspect the mulched areas after each significant rain or wind event and repair damage to the site and the mulch cover as needed until adequate vegetative cover is established.

Reseed and apply additional mulch to any areas that do not have adequate cover.

Remove or redistribute excess mulch that has been piled by wind or rain.

**Table 1. Guide to Mulch Materials, Rates, and Uses**

Mulch Material (Natural Material)	Quality Standard	Application Rates		Depth of Application	Remarks
		per 1000 sq ft	per acre		
Sawdust, Green, or Composted & Ground Corn Cobs	Free from weeds, trash & coarse materials	200-300 cu. ft.	-----	1-7"	Most effective as mulch around ornamentals, small fruits, & other nursery stock. Special application rates: Fruit trees 5-7", blueberries 6", vegetable and flowers 2-3". Most resistant to wind blowing. Requires 30-35 lbs. N/ton to prevent N deficiency while decaying mulch. Recommended rate based on one cu. ft. weighting 24 lbs.
Wood Chips or Bark	Green or air-dried. Free of weed seeds, trash, and coarse materials.	469-920 lbs.	10-20 tons	2-7"	Has about the same use and application as sawdust, but requires less N/ton (20-25 lbs.). Resistant to wind blowing. Decomposes slowly.
Wood Excelsior	Green or air-dried burred wood fibers.	90 lbs. (1 bale)	2 tons	-----	Effective for erosion control. Tie-down usually not required. May be subject to some wind blowing. Packaged in 80-90 lb. bales. Decomposes slowly.
Wood Fiber Cellulose (Partly digested wood fibers)	Made from natural wood usually with green dye & dispersing agent added. Max 15% moisture packed.	50 lbs. (1 bale)	2000 lbs.	-----	When used for erosion control on critical areas, double application rate. Apply with hydromulcher. Tie-down generally not required.
Compost or Manure	Well shredded, relatively free of coarse material & weed seed.	360-460 lbs.	8-10 tons	-----	Use manure heavy with straw where erosion control is needed. May create a problem with weeds. Excellent moisture conservation. Resistant to wind blowing.
Cornstalks, Shredded or Chopped	Air-dried, shredded into 8"-12" lengths.	180-280 lbs.	4-6 tons	-----	Effective for erosion control, relatively slow to decompose. Excellent for mulch on crop fields. Some value as a cover crop. Resistant to wind blowing.
Gravel, Crushed Stone, or Slag	Washed: Size ¼ to 1½"	9 cu. yd.	-----	3" thick	Excellent mulch for short slopes & around woody plants & ornamentals. Use ¼ - ½" size where subject to foot traffic (approx. 2500 lbs./cu. yd.).
Straw, Grass Hay, Alfalfa Hay	Air-dried; free of undesirable seeds & coarse materials.	70-115 lbs. or 1½-2½ 50 lb. bales	1½-2½ tons or 60-100 50 lb. bales	Lightly cover 75-90% of surface; 1½-2½" thickness.	Use heavier rates where mulch benefits are to be maintained for more than 3 months. Subject to wind blowing unless kept moist or tied down. Most common, widely used mulching materials. Good for erosion control.
Peat Moss	Dried, compressed free of coarse materials.	200-400 cu. ft.	-----	2"-4"	Most effective as a mulch around ornamentals. Subject to wind blowing unless kept wet. Packaged in 100 lb. bales (6 cu. ft.). Excellent moisture holding capacity.

**Table 1. Guide to Mulch Materials, Rates, and Uses**

Mulch Material (Manufactured Material)	Quality Standard	Application Rates		Depth of Application	Remarks
		Per 1000 sq ft	per acre		
Twisted Kraft Paper Yarn	Plain weave, warp 7 per in., filling 4 per in. selvage edge with polypropylene filament.	45" x 250 yd.	Roll 100 lbs.	1 layer thick	Use to hold seed and aid in germination without mulch. Tie down according to manufacturing specifications.
Twisted Kraft Paper Yarn	Fungicide treated warp 1.1 pairs per in. filling 2.5 in.	45" x 250 yd.	Roll 80 lbs.	1 layer thick	Use over bare soil or sod to prevent erosion and hold seed. Good for waterways, critical slopes & critical ditch bottoms. Tie down with staples as per manufacturing specifications.
Jute, Twisted Yarn	Undyed, unbleached plain weave. Warp 78 ends/yd. Weft 41 ends/yd.	48" x 50 yd. Or 48" x 75 yd.	Roll 60 lbs. 90lbs.	1 layer thick	Use without additional mulch. Tie down as per manufacturing specification. Effective for erosion control on critical areas.
Fiber Blankets	Interlocking fibers with 80% of the fibers 6" or longer in length & evenly distributed over the entire area of the blanket. Top of blanket to be covered with extruded, biodegradable plastic mesh. Each roll will weigh approx. 0.9 lbs. per sq. yd.	4' x 83 yd.	61 rolls	1 roll thick	Use without additional mulch. Tie down as per manufacturing specifications.
Plastic	Thickness 2 to 4 mils	Comes in variable widths up to 50"	-----	1 layer thick	Use black for weed control; use white for seeding establishment without organic mulch. Release plastic after seeding is established. Effective moisture conservation and weed control for small fruits. Large areas should have holes punched to let rainfall percolate.
Polypropylene fabric	Thickness 14 mils minimum	6' x 300' or 3' x 3' squares	-----	1 layer thick	Fabric water conservation mulch must be black and/or capable of preventing underlying plant growth. Used as landscaping fabric particularly with tree establishment. Mulch will repel water for 3 – 4 weeks due to chemical surfactant on material. Anchor edges of fabric and occasionally in center with soil, stones, or staples.

**Table 2. Mulch Anchoring Guide**

<b>Anchoring Method or Material</b>	<b>Kind of Mulch To Be Anchored</b>	<b>How to Apply</b>
<b>Manual</b>		
Peg & Twine	Straw, Grass Hay	After mulching divide areas into blocks approx. 1 sq. yd. in size. Drive 4-6 pegs per block to within 2"-3" of soil surface. Secure mulch to surface by stretching twine between pegs in crisscross pattern on each block. Secure twine around each peg with 2 or more turns. Drive pegs flush with soil where mowing & maintenance planned.
Mulch Netting	Straw, Grass Hay, Compost, Wood Shavings	Staple light-weight paper, jute, wood fiber, or plastic nettings to soil surface according to manufacturer's recommendations.
Soil & Stones	Plastic, Polypropylene fabric	Plow a single furrow along edge of area to be covered with plastic, fold about 6" of plastic into the furrow and plow furrow slice back over plastic. Use stones or a shovel full of soil to hold plastic or fabric down in other places as needed.
Silt	Straw, Grass Hay	Cut mulch into soil surface with square-edge spade. Make cuts in contour rows; space 18" apart.
<b>Mechanical</b>		
Asphalt Spray (emulsion)	Compost, Wood Chips, Wood Shavings, Straw, Grass Hay	Apply with suitable spray equipment using the following rates: Asphalt emulsion 0.04 gallons per square yard; liquid asphalt (rapid, medium, or slow setting) 0.10 gallons per square yard. The asphalt emulsion will comply with ASTM Spec. D977.
Wood Cellulose Fiber	Straw, Grass Hay, Alfalfa Hay	Apply with hydroseeder immediately after mulching. Use 750 lbs. wood fiber per acre.
Mulch Anchoring Tool or Disk (Smooth or Notched)	Straw, Grass Hay, Alfalfa Hay, and Manure	Apply mulch and pull a mulch anchoring tool over mulch. When a disk (smooth) is used, set in straight position and pull across slope with suitable power equipment. Mulch material should be "tucked" into soil surface about 2 inches.
Mulch Tackers (Water Dispersible)	Straw, Grass Hay, Wood Chips, Wood Shavings	Apply with suitable spray equipment following manufacturer's recommendation.