

Chapter 5 - VEGETATIVE PRACTICE STANDARDS

MULCHING

Definition

Application of a protective blanket of straw or other plant residue, gravel, or synthetic material to the soil surface.

Purpose

To protect the soil surface from the forces of raindrop impact and overland flow. Mulch fosters the growth of vegetation, reduces evaporation, insulates the soil, and suppresses weed growth. Mulch is frequently used to accent landscape plantings.

Conditions Where Practice Applies

Mulch temporary or permanent seedings immediately. Areas that cannot be seeded because of the season should be mulched to provide temporary protection of the soil surface. Use an organic mulch in this case (but not wood fiber), and seed the area as soon as possible. Mulch around plantings of trees, shrubs, or ground covers to stabilize the soil between plants.

Planning Considerations

A surface mulch is the most effective, practical means of controlling runoff and erosion on disturbed land prior to vegetation establishment. Mulch reduces soil moisture loss from evaporation, prevents crusting and sealing of the soil surface, moderates soil temperatures, provides a suitable microclimate for seed germination, and may increase the infiltration rate of the soil.

Organic mulches such as straw, woodchips, and shredded bark have been found to be the most effective (Table 5-1). Do not use materials which may be sources of competing weed and grass seeds. Decomposition of some wood products can tie up significant amounts of soil nitrogen, making it necessary to modify fertilization rates or add fertilizer with the mulch.

A variety of mats and fabrics have been developed in recent years for use as mulch, particularly in critical areas such as waterways and channels. Various types of netting materials are also available to anchor organic mulches.

Chemical soil stabilizers or soil binders, when used alone, are less effective than other types of mulches. These products are primarily useful for tacking wood fiber mulches.

The choice of materials for mulching should be based on soil conditions, season, type of vegetation, and size of the area. A properly applied and tacked mulch is always beneficial. It is especially important when conditions for germination are not optimum, such as midsummer and early winter, and on difficult areas such as cut slopes and slopes with southern exposures.

Organic Mulches

Straw is the mulch most commonly used in conjunction with seeding. The straw should come from wheat or oats ("small grains"), and may be spread by hand or with a mulch blower. Straw may be lost to wind and must be tacked down.

Woodchips are suitable for areas that will not be closely mowed, and around ornamental plantings. Chips do not require tacking. Because they decompose slowly they must be treated with 12 pounds of nitrogen per ton to prevent nutrient deficiency in plants. This can be inexpensive mulch if chips are obtained from trees cleared on the site.

Bark chips and shredded bark are by-products of timber processing often used in landscape plantings. Bark is also a suitable mulch for areas planted to grasses and not closely mowed. It may be applied by hand or with a mulch blower. Unlike woodchips, the use of bark does not require additional nitrogen fertilizer.

Wood fiber refers to short cellulose fibers applied as a slurry in hydroseeding operations. Wood fiber does not require tacking, although tacking agents or soil binders can easily be added to the slurry. Wood fiber hydroseeder slurries may be used to tack straw mulch on steep slopes, critical areas, and where harsh climatic conditions exist. Wood fiber mulch does not provide sufficient erosion protection to be used alone.

There are other organic materials that make excellent mulches but may only be available locally or seasonally, for example: dried sewage sludge, corn stalks, animal manure, pine boughs, cotton burs, peanut hulls, and hay. Creative use of these materials can reduce costs.

Chemical Mulches and Soil Binders

A wide range of synthetic mulching compounds is available to stabilize and protect the soil surface. These include emulsions or dispersions of vinyl compounds, asphalt, or rubber mixed with water. They may be used alone or may be used to tack wood fiber hydromulches.

When used alone, chemical mulches do not insulate the soil or retain moisture and therefore do little to aid seedling establishment. They are easily damaged by traffic, are usually more expensive than organic mulches, and they decompose in 60-90 days.

Check labels on chemical mulches and binders for environmental concerns. Take precautions to avoid damage to fish, wildlife, and water resources.

Nets, Mats, and Roving

Netting is very effective in holding mulch in place on waterways and slopes before grasses become established.

Mats promote seedling growth in the same way as organic mulches. They are very useful in establishing grass in channels and waterways. A wide variety of synthetic and organic materials are available. "Excelsior" is a wood fiber mat, and should not be confused with wood fiber slurry.

When installing nets and mats, it is critical to obtain a firm, continuous contact between the material and the soil. Without such contact, the material is useless and erosion will occur underneath.

Fiberglass roving consists of continuous strands of fiberglass which, when blown onto the soil surface from a special compressed air ejector, form a mat of glass fibers. This mat must then be tacked down with asphalt.

Plans and Specifications

1. General. Select a material based on site and practice requirements, availability of material, and availability of labor and equipment.

Before mulching, complete the required gradings, install sediment control practices, and prepare the seedbed. Apply seed before mulching except in the following cases:

- a. Seed is applied as part of a hydroseeder slurry containing wood fiber mulch.
- b. A hydroseeder slurry is applied over straw.

2. Application of Organic Mulch. Organic mulches are effective where they can be tacked securely to the surface.

Spread mulch uniformly, by hand or with a mulch blower. When spreading straw mulch by hand, divide the area to be mulched into sections of approximately 1,000 ft² and place 70-90 lb of straw (1 1/2 to 2 bales) in each section to facilitate uniform distribution. After spreading mulch, no more than 25 percent of the ground surfaces should be visible. In hydroseeding operations a green dye, added to the slurry, assures a uniform application.

3. Anchoring Organic Mulch. Straw mulch must be anchored immediately after spreading. The following methods of anchoring mulch may be used:

- a. Mulch anchoring tool. A tractor-drawn implement designed to punch mulch into the soil, a mulch anchoring tool provides maximum erosion control with straw. A regular farm disk, weighted and set nearly straight, may substitute, but will not do a job comparable to the mulch anchoring tool. The disk should not be sharp enough to cut the straw. These methods are limited to slopes no steeper than 3:1, where equipment can operate safely on the contour.
- b. Liquid mulch binders. Application of liquid mulch binders and tackifiers should be heaviest at the edges of areas and at crests of ridges and banks, to resist wind. Binder should be applied

uniformly to the rest of the area. Binders may be applied after mulch is spread or may be sprayed into the mulch as it is being blown onto the soil. Applying straw and binder together is the most effective method. Liquid binders include asphalt and an array of commercially available synthetic binders.

Emulsified asphalt is the most commonly used mulch binder. Any type thin enough to be blown from spray equipment is satisfactory. Asphalt is classified according to the time it takes to cure. Rapid setting (RS or CRS designation) is formulated for curing in less than 24 hours, even during periods of high humidity is best used in spring and fall. Medium settings (MS or CMS) is formulated for curing within 24 to 48 hours, and slow setting (SS or CSS) is formulated for use during hot, dry weather, requiring 48 hours or more curing time.

Apply asphalt at 0.10 gallon per square yard (10 gal/1000 ft²). Heavier applications cause straw to "perch" over rills.

In traffic areas uncured asphalt can be picked up on shoes and cause damage to rugs, clothing, etc. Use types RS or CRS to minimize such problems.

Synthetic binders such as Petroset, Terratack, and Aerospray may be used, as recommended by the manufacturer, to anchor mulch. These are expensive and therefore usually used in small areas or in residential areas where asphalt may be a problem (Use of trade names does not constitute an endorsement).

- c. Mulch nettings. Lightweight plastic, cotton, jute, wire, or paper nets may be stapled over the mulch according to the manufacturer's recommendations (see "Nets and Mats" below).
 - d. Peg and twine. Because it is labor-intensive, this method is feasible only in small areas where other methods cannot be used. Drive 8-10-inch wooden pegs to within 3 inches of the soil surface, every 4 ft in all directions. Stakes may be driven before or after straw is spread. Secure mulch by stretching twine between pegs in a criss-cross-within-a-square pattern. Turn twine two or more times around each peg. Twine may be tightened over the mulch by driving pegs further into the ground.
 - e. Vegetation. Wheat may be used to anchor mulch in fall plantings, and browntop millet in spring. Broadcast seed before applying mulch.
4. Chemical Mulches. Chemical mulches may be effective for soil stabilization if used between May 1 and June 15, or Sept. 15 and Oct. 15, provided that they are used on slopes no steeper than 4:1, and that proper seedbed preparation has been accomplished, including surface roughening where required.

Chemical mulches may be used to bind other mulches, or with wood fiber in a hydroseeded slurry at any time. Follow the manufacturer's recommendations for application.

5. Fiberglass Roving. Fiberglass roving ("roving") is wound into a cylindrical package so that it can be continuously withdrawn from the center using a compressed air ejector. Roving expands into a mat of glass fibers as it contacts the soil surface. It is often used over a straw mulch, but must still be tacked with asphalt.

Spread roving uniformly over the area at a rate of 0.25 to 0.35 lb/yd². Anchor with asphalt immediately after application, at a rate of 0.25 to 0.35 gal/yd².

As a channel lining, and at other sites of concentrated flow, the roving mat must be further anchored to prevent undermining. It may be secured with stakes placed at intervals no greater than 10 ft along the drainageway, and randomly throughout its width, but not more than 10 ft apart. As an option to staking, the roving can be buried to a depth of 5 inches at the upgrade end and at intervals of 50 ft along the length of the channel.

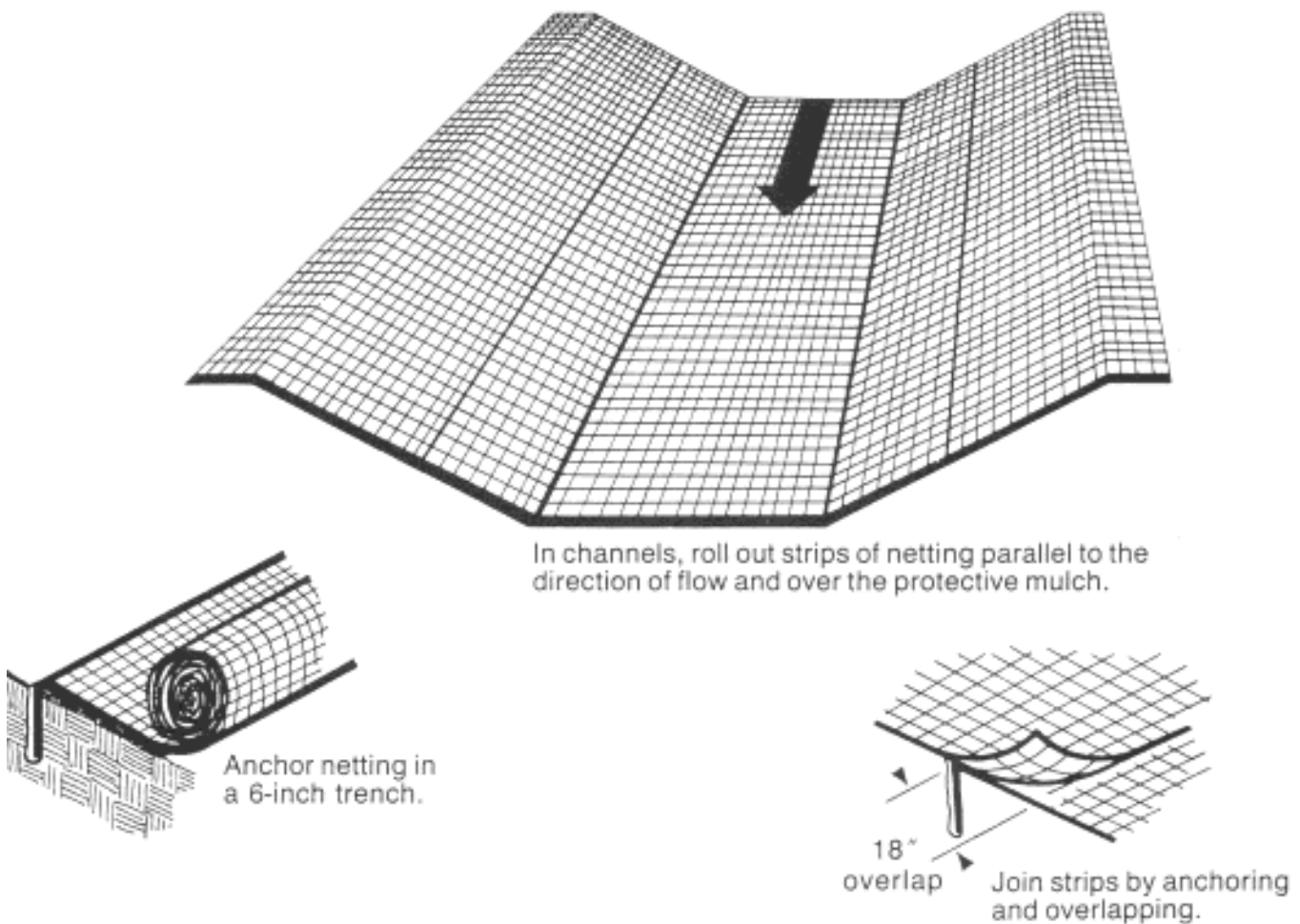


Figure 5-6 Installation of netting and matting.

6. Nets and Mats. Nets alone generally provide little moisture conservation benefits and only limited erosion protection. Therefore, they are usually used in conjunction with an organic mulch such as straw.

Except when wood fiber slurry is used, netting should always be installed over the mulch. Wood fiber may be sprayed on top of an installed net.

Mats, including "excelsior" (wood fiber) blankets, are considered protective mulches and may be used alone, on erodible soils, and during all times of the year. Place the matting in firm contact with the soil and staple securely.

7. Installation of Netting and Matting. Products designed to control erosion should be installed in accordance with manufacturer's instructions. Any mat or blanket-type product used as a protective mulch should provide cover of at least 30 percent of the surface where it is applied.
 - a. Apply lime, fertilizer and seed before laying the net or mat. If open-weave netting is used, lime may be incorporated before installing the net and fertilizer and seed sprayed on afterward.
 - b. Start laying the net from the top of the channel or slope and unroll it down the grade. Allow netting to lay loosely on the soil but without wrinkles--do not stretch.
 - c. To secure the net, bury the upslope end in a slot or trench no less than 6 inches deep, cover with soil, and tamp firmly. Staple the net every 12 inches across the top end and every 3 ft around the edges and bottom. Where 2 strips of net are laid side by side, the adjacent edges should be overlapped 3 inches and stapled together. Each strip of netting should also be stapled down the center, every 3 ft. Do not stretch the net when applying staples.
 - d. To join two strips, cut a trench to anchor the end of the new net. Overlap the end of the previous roll 18 inches and staple every 12 inches just below the anchor slot.

Maintenance. Inspect all mulches periodically, and after rainstorms to check for rill erosion, dislocation, or failure. Where erosion is observed, apply additional mulch. If washout occurs, repair the slope grade, reseed, and reinstall mulch. Continue inspections until vegetation is firmly established.

Table 5-1 Mulching materials and application rates.

Material	Rate Per Acre	Quality	Notes
Organic Mulches			
Straw	1-2 tons	Dry, unchopped, unweathered; avoid weeds.	Should come from wheat or oats; spread by hand or machine; must be tacked down.
Woodchips	5-6 tons	Air dry	Treat with 12 lbs nitrogen/ton. Apply with mulch blower, chip handler, or by hand. Not for use in fine turf.
Wood fiber	0.1-1 tons		Also referred to as wood cellulose. May be hydroseeded. Do not use in hot, dry weather.
Bark	35 cubic yards	Air dry, shredded hammer-milled, or chips.	Apply with mulch blower, chip handler by hand. Do not use asphalt tack.
Sericea lespedeza seed-bearing stems	1-3 tons	Green or dry; should contain mature seed.	
Nets and Mats			
Jute net	Cover area	Heavy, uniform; woven of single jute yarn.	Withstands waterflow. Best when used with organic mulch.
Fiberglass net	Cover area		Withstands waterflow. Best when used with organic mulch.
Excelsior (wood fiber) mat	Cover area		Withstands waterflow.
Fiberglass roving	0.5-1 tons	Continuous fibers of drawn glass bound together with a non-toxic agent.	Apply with a compressed air ejector. Tack with emulsified asphalt at a rate of 25-35 gal/1000 sq ft.

