NRCS	**Michigan Technical Note** **USDA-Natural Resources Conservation Service**

Agronomy #10
Mulching Materials for Control of Soil Erosion
September 2013

Purpose

This document describes several mulch materials and manufactured products that can be used to prevent soil erosion from wind and water. The materials have application in conservation plantings, stream bank and roadside stabilization, orchard and vegetable production, and landscaping. This document is an update of Agronomy Technical Note #10, Manufactured Mulching Materials, dated July, 1975. This is a supplement to Michigan Conservation Practice Standard 484 "Mulch." Please refer to the Conservation Practice Standard, associated Job Sheets and Statement of Work for guidance in selecting and applying mulch for a particular use.

This is only meant to be a representative sample of products available. Omission of any particular product or company is not intentional. This listing does not in any way indicate endorsement by the USDA Natural Resources Conservation Service.

Mulch Materials

Straw and wood fibers (wood chips) are the most common materials applied as loose mulch. Both materials are easy to find at retail stores and landscape supply companies and relatively inexpensive.

Grass seedlings emerging through straw mulch

Wood chip mulch around trees

Applying straw or wood fiber mulch directly to soil may limit nitrogen availability. Refer to Conservation Job Sheet 484 "Mulching" for directions on supplemental nitrogen.

Other plant based mulch materials include jute, coconut coir fiber and paper. Those materials are usually applied in a manufactured or blended product such as erosion control blankets or

hydro-mulches. Plant based materials are usually considered temporary and are intended to degrade after the establishment of permanent vegetation.

Manufactured Products

Consult manufacturer's directions for proper application and anchoring of specific manufactured products. Statements below are intended as general guidelines.

Plastic and rubber mulches

Plastic sheet mulch is commonly used in raised bed vegetable production. Sheet plastic can be used to warm the soil, control weeds, conserve soil moisture, and provide erosion control. Rubberized mulch chips are used in some landscaping applications and playgrounds. Synthetic netting is used as an anchoring product to hold loose mulch in place.

Plastic mulch in vegetable production

Geotextile materials

Woven and non-woven geotextile materials are used primarily as a structural member of a stabilization practice and are considered more long lasting than plant based mulches. Woven geotextile materials are recommended for applications requiring separation of mulch from soil. Non-woven geotextile materials are recommended for applications requiring separation and filtration. Geotextile materials are also used for weed and erosion control in landscaping and tree planting.

Geotextile fabric applied to a drainage ditch

Hydraulic Mulches

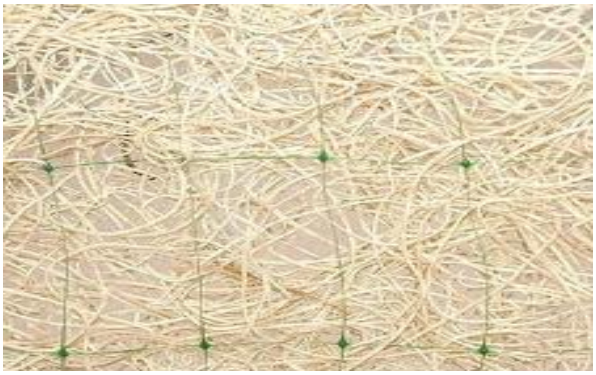
Hydraulic mulches sometimes referred to as hydro-mulches, consist of cellulose (paper), wood fibers, or a blend of the two. Hydro-mulches are used with binding agents (tackifiers) to hold the mulch together and adhere it to the soil. Seed and fertilizer can also be added to the hydro-mulch for efficiency of planting and site stabilization. Hydraulic mulches are mixed in hydraulic mulching equipment, sometimes referred to as a hydro-seeder, and applied to the soil as pressurized slurry. Determine application rates by manufacturer's specifications which account for slope grade and materials used in the mulch.

Hydraulic mulch application

Erosion control mats

Erosion control mats (or blankets) are manufactured products with chopped straw, wood fibers, or coconut fibers between layers of jute or UV degradable plastic netting. They are designed for a variety of applications depending on slope, water velocity, longevity and desired vegetation. They come in a variety of widths lengths and mulch densities depending on the manufacturer. When used in applications where vegetation is established from seeds the seeds are planted and the erosion control mats are applied over the seeded area. Erosion control mats need to be overlapped and anchored with wire staples as per manufacturer's specifications. These are effective for erosion control on moderate to steep slopes.

Erosion control blanket with straw on slope

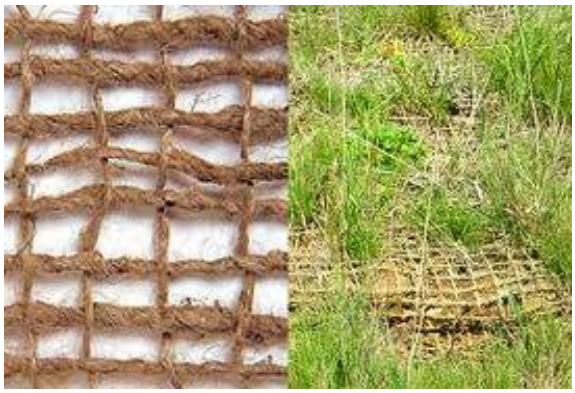


Erosion control blanket with wood fiber in plastic netting

Mulch anchoring materials:

Jute netting

This is a net made of jute that can be applied over straw or wood mulch to protect the mulch from wind and water damage. It reduces soil erosion and provides a good environment for vegetative growth. Jute netting can also be used as a substitute for straw or wood mulch. When used in applications where vegetation is established from seeds the seeds can be planted before the jute netting is applied. Seeds can be planted after jute netting is applied and soil spread over the top of the net. Care should be taken not to cover the seeds with too much soil as that could inhibit seed germination. Jute netting can also be applied to areas where transplanted trees or herbaceous plants will be used. As with other erosion control mats jute netting must be overlapped with each other and anchored to the soil according to manufacturer's specifications.



Jute netting **Jute netting with vegetation**

Mulch tackifiers

Tackifiers are sticking or binding agents that hold soil particles together and help bind mulch to the soil surface. They can be applied either with mulch, such as with hydro-mulching, or directly to the soil. Organic tackifiers are made from plant materials such as guar gum, plantago, or corn starch. Organic tackifiers are effective on flat to moderate slopes. Polyacrylamide (PAM) tackifiers last longer than organic tackifiers and are well suited for holding soil particles together.

Tackifier, mulch, seed and fertilizer in a hydro-seeding machine

Crimper

A tractor or bulldozer-drawn mulch anchoring coulter (crimper) is used to push mulch into the soil. After crimping part of the mulch should be in the soil and part of it should be standing upright. Care should be taken not to cut the mulch particles. Most farm disks will be too aggressive with cutting and burying mulch fibers unless set nearly straight and shallow to prevent burial. Disk depth should not exceed 2 inches. The general contour of the site should be followed when crimping.

Mechanical crimper pushing mulch into soil

Roller Puncher

A roller puncher is an alternative to a coulter based crimper. It has a roller equipped with straight studs not less than 6 inches long, from 4-6 inches wide and approximately one inch thick is rolled over the slope.

Sources of manufactured mulch and anchoring products

There are many manufacturers and retailers of manufactured mulch and anchoring products. Most manufacturers and retailers have catalogs and product specifications on their respective websites. Local retailers and landscape supply companies often carry erosion control products and anchoring materials.

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