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TECHNICAL NOTES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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EAST LANSING, MICHIGAN 48823

ADMINISTRATIVE MATERIAL - FOR USE ONLY WITHIN THE SOIL CONSERVATION SERVICE

Agronomy #10

SUBJECT: Manufactured Mulching Materials

DATE: July 25, 1975

To: All Offices

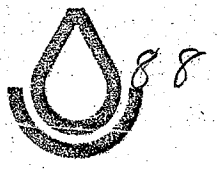
From: Richard H. Drullinger, State Resource Conservationist

MANUFACTURED MULCHING MATERIALS

On the following pages is a partial listing of various mulching material with brief description and product source information.

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 me or by the USDA Soil Conservation Service.

The last page shows research data comparing long-fibered and short-fibered mulch material in erosion control and seeding establishment on a highway fill slope.



JUTE NETTING

Technical Information

PRIMARY USAGE:

Jute Netting is used in the establishment of vegetation in critical areas. As a mulching product, it conserves soil moisture, serves as an insulator against intense solar insolation, dissipates energy from falling raindrops, and reduces erosion caused by overland flow. The thick strands and heavy weave enable this product to withstand the higher flow velocities associated with critical swales, ditches, median strips, etc.

DESCRIPTION:

Jute Netting is a heavy woven jute mesh of rugged construction. It is constructed of undyed and unbleached twisted jute fibers. It can be treated to be smolder resistant. It is commonly available in individual rolls, 225 feet long and 4 feet wide. Each roll contains 100 square yards and weighs approximately 90 pounds.

INSTALLATION INSTRUCTIONS:

Prepare seedbed according to local specifications. Seeding may be split so that one-half of seed is sown after the jute has been applied. Each specific site may require some modification or variation from the general criteria listed below. Manufacturer technical representatives on conservationists experienced in the use of this material should be consulted for specific guidance.

In general, start laying the thatching from the top of the channel and unroll downgrade so that one edge of the strip coincides with the channel center. Lay a second strip parallel to the first on the other side of the channel and allow a two-inch overlap. If one roll of thatching does not extend the length of the channel, continue downhill with additional rolls.

Bury the top end of the jute strip in a trench four inches or more deep. Tamp the trench full of soil. Reinforce with a row of staples driven through the jute about four inches downhill from the trench. These staples should be 4 to 10 feet apart. The outside edges may be stapled similarly at any time after the center has been stapled. Closer stapling along the sides is required where concentrated water may flow into the channel.

Succeeding strips of thatching, farther down the channel, are secured in a similar manner.

Where one roll of thatching ends and another roll begins, the end of the top strip overlaps the trench where the upper end of the lower strip is buried. Make the overlap at least four inches and staple securely. If the ends and edges of the strips of thatching are securely stapled, stapling in the strip middles may be 10 feet apart or ommitted entirely.

At any point the thatching may be folded for burying in slit trenches and secured as were the upper ends. This checks water flow and erosion that may begin under the matting. It also gives improved tie-down.

Insure contact between thatching and soil by rolling after laying, stapling and seeding is complete. Perfect contact is vital to keep water flow over, not under, the jute.

After job completion, make sure the thatching is in contact with the soil at all places and that critical areas are securely stapled down.

Hairpin-shaped wire staples, No. 8 gauge; 6, 8, and 10 inches long have been used. The longer staples are used in loose or wet soil. Wire staples are better than wooden pegs because the staples can be driven flush with the matting. Wooden pegs extend above the thatching and may catch trash that diverts water flow out of the thatch-protected channel. Wooden pegs may also set up a damaging turbulence.

PRODUCT INFORMATION SOURCE:

Belton Bagging Company
P.O. Box 127
Belton, South Carolina 29627

Bemis Company, Inc.
P.O. Box 12224 Soulard Station
2400 South Second Street
St. Louis, Missouri 63104

Ludlow Corporation
Textile Division
Needham Heights, Massachusetts 02194

NETTING

Technical Information

PRIMARY USAGE:

Netting is used as a means by which natural or synthetic fiber mulch can be securely anchored on seeded areas or areas temporarily stabilized with mulch on which conventional mulch tacking products (asphalt, chemicals, etc.) are judged to be insufficient. This approach to tacking mulch is often used on very steep areas and on odd shaped areas, especially around structures. Nettings are also used to reinforce newly placed turf that may be subjected to severe runoff velocities before the root zone has matured to the point where turf structure alone can withstand the anticipated stress.

DESCRIPTION:

Several products are on the market and compositions range from tightly twisted Kraft paper yarns to polypropylene oriented plastic to fiber glass scrim. All are lightweight. The Kraft paper yarns are biodegradable. The polypropylene is ultraviolet sensitive and gradually disintegrates in the presence of sunlight. The polypropylene net and fiber glass scrim will not support combustion. All products are marketed in rolls. Roll widths range from 3.75 to 15 feet. Lengths range to 2500 feet.

INSTALLATION INSTRUCTIONS:

Generally these products are unrolled and stapled on areas that have been mulched with natural and synthetic fiber mulch. Staple placement is not as critical in securing netting on mulch as it is with some of the other products discussed in this Appendix. Guidance can be secured from manufacturer's technical representatives or conservation specialists familiar with the use of these products.

When used to anchor newly placed sod, stapling becomes more critical and staple placement on 36-inch centers is often used. Netting with small openings is susceptible to heaving as the turf matures.

PRODUCT INFORMATION SOURCES:

Bemis Company, Inc.
P.O. Box 12224 Soulard Station
St. Louis, Missouri 63157
(Mulch net – Kraft paper)

Conwed Corporation
332 Minnesota Street
St. Paul, Minnesota 55101
(Conwed Erosion Control Netting)

PPG Inductries, Inc.
Fiber Glass Division
One Gateway Center
Pittsburgh, Pennsylvania 15222
(Fiber glass scrim)

FIBER GLASS MATTING

Technical Information

PRIMARY USAGE:

Erosion check construction is one of the most common applications of Fiber Glass Matting. In its various forms, it is also used in landscaping as a filter-separator between topsoil and gravel drainage beds, and as a mulch for seedbeds and for other applications. In this document it is only considered in its application for use in the construction of erosion checks and as a mulch for seedbeds.

DESCRIPTION:

Fiber Glass Matting is composed of flexible fiber glass that is made of inorganic materials that will not rot, corrode, or burn. It is supplied in rolls of material ½-inch thick. Roll width can be variable from two to six feet. Roll length varies from 100 to 150 feet.

INSTALLATION INSTRUCTIONS:

At locations where erosion checks are planned a trench is dug across the ditch, swale, slope etc. Place fiber glass matting in an "L" shape with the long dimension up; staple matting against the vertical side of the trench and along the bottom sufficiently to hold it in place. Backfill, tamp, and trim matting flush with the surface.

Where long-term resistance to erosive forces is desired in conjunction with vegetation, Fiber Glass Matting can be used as a mulch blanket. It is applied in a similar manner to the Excelsior Blanket.

PRODUCT INFORMATION SOURCE:

Certain-Teed Products Corporation
Gustin-Bacon Division
3050 Fairfield Road
P.O. Box 15079
Kansas City, Kansas 66115
(Ultracheck®)

PPG Industries, Inc.
Fiber Glass Division
One Gateway Center
Pittsburgh, Pennsylvania 15222
(Topsoil Separator)

EXCELSIOR BLANKET

Technical Information

PRIMARY USAGE:

The Excelsior Blanket is a protective blanket used in the establishment of vegetation in critical areas. As a mulching product it conserves soil moisture, serves as an insulator against intense solar insolation, dissipates energy from falling raindrops, and reduces erosion caused by overland flow. The use of a reinforcing weave, the intertwined nature of the excelsior, and the fact that the blanket is secured to the soil by metal staples make this product resistant to erosion by concentrated storm runoff. It can, therefore, be used in critical areas such as swales, ditches, steep slopes, highly erodible soil, etc.

DESCRIPTION:

The Erosion Control Excelsior Blanket consists of a machine produced mat of curled wood excelsior of 80 percent eight inch or longer fiber length. It is of consistent thickness and the fiber is evenly distributed over the entire area of the Blanket. The top side of each Blanket is covered with a 3" x 1" weave of twisted Kraft paper or biodegradable plastic mesh that has a high wet strength. Blankets are smolder resistant and contain no chemical additives. The Blankets are available in 3' x 150' rolls and in 4' x 180' rolls. They are secured to the soil by the use of heavy duty wire staples.

INSTALLATION INSTRUCTIONS:

Each specific site may require some modification or variation from the general criteria listed below. Manufacturer technical representatives or conservation specialists experienced in the use of this product should be consulted for guidance. In general the Blanket is rolled out on the seeded area to be protected and is stapled into place. Suggested staple application rate, under normal conditions, is five staples per six linear feet of Blanket, placed two along each side and one in the middle. Where more than one Blanket is required they are butt-joined and securely stapled. Care should be exercised to ensure that the Blanket is placed with the weave side up. When used in areas of concentrated flow they must be extended laterally to an elevation that is several inches above the elevation of the design high flow. This precaution will discourage gully and rill formation along the margins of the installation.

PRODUCT INFORMATION SOURCE:

American Excelsior Company
P.O. Box 5067, 850 Avenue H. East
Arlington, Texas 76011
(Erosion Control Excelsior Blanket)

WOOD FIBER MULCH

Technical Information

PRIMARY USAGE:

Wood fiber mulch is specifically designed for use as a hydraulically applied mulch that aids in the establishment of turf or other seeded or sprigged ground covers. As a mulching product, it conserves soil moisture, serves as an insulator against intense solar insolation, and dissipates energy from falling raindrops.

DESCRIPTION:

Wood fiber mulch is a natural, short fiber product, produced from clean, whole wood chips. A nontoxic dye is used to color the mulch green in an effort to aid visual metering in its application. It is evenly dispersed and suspended when agitated in water, and when applied uniformly on the surface of the soil, the fibers form an absorbent cover, allowing percolation of water to the underlying soil. Wood fiber mulch has the following physical properties:

Property	Nominal Value
Moisture Content	9.0-12.0% ± 3.0%
Organic Matter (Oven-Dried Basis)	99.2-99.6% ± 0.2%
Ash Content	0.4-0.8% ± 0.2%
Water Holding Capacity (grams of water/100 grams of fiber)	at least 1080-1150 grams

Wood fiber mulch contains no growth or germination inhibiting factors. In hydroseeder slurries, it is compatible withh seed, lime, fertilizer, etc. It is packaged in Kraft paper bags containing 50 pounds each.

INSTALLATION INSTRUCTIONS:

Wood fiber should be applied by hydroseeder at rates of 1000-1500 pounds per acre. It is introduced into the slurry tank after the proportionate quantities of seed, fertilizer, etc., have been introduced. The components are agitated into a well mixed slurry and are sprayed onto the sites or plots to be seeded.

PRODUCT INFORMATION SOURCE

Wood Conversion Co.
First National Bank Bldg.
St. Paul, MINN 55101
(Conwed Hydro Mulch)

Weyerhauser Co.
Box B 4132
Tacoma, WASH 98401
(Silva-Fiber)

International
Paper Co.
Special Products
Mobile, ALA.
(Turfiber)

WOODCHIPS

Technical Information

PRIMARY USAGE:

Woodchips are used as a temporary or interim erosion control technique to protect bare soil areas that have not been seeded. They are also used as a mulch product on newly seeded areas. In this capacity, they conserve soil moisture during dry periods, dissipate energy from falling raindrops, serve as insulators against intense solar insolation, and reduce erosion caused by overland sheet flow. Woodchips may also be used on pathways and to reinforce leaf mold, duff, etc., in wooded areas that are to be preserved.

DESCRIPTION:

Chips of wood are produced by processing tree trunks, limbs, branches, etc., in woodchipping machines. The chips are placed by blower back on the site from which they originate or are placed in trucks for transport to other sites where they are spread for use.

INSTALLATION INSTRUCTIONS:

As a temporary technique on unseeded areas, the chips are placed by machine or spread by hand tools. Application rates range from 4 to 6 cubic feet of woodchips per 100 square feet of area. This application rate is ample to protect bare soil under normal conditions. If intensive foot or vehicle traffic is anticipated, this rate may be increased to the point where woodchip depths of several inches are attained. This very heavy application rate is particularly applicable to yard areas adjacent to homes under construction if autos and light trucks drive and park in the yard areas.

As a mulching product on newly seeded areas, woodchips may be placed by machine blower or by hand from stockpiles. Application rates of 60-100 cubic yards per acre are commonly recommended. Mulching with woodchips has proven successful and when used with late fall seeding operations that require protection over winter. Experimental work is needed to perfect seed mixtures for this type of operation. However the woodchip mulch has proven to be satisfactory under these conditions.

As more interest in preserving "natural" woodland conditions on construction sites is expressed, the use of woodchips to supplement existing leaf mold, duff, etc., is accelerating. Chips that cannot be utilized in mulching operations can safely be returned to the forest floor to supplement existing organic cover. This technique is beneficial in that it upgrades the woodland surface area and provides a means to recycle rather than dispose of a natural by-product.

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COMPARISON of LONG- and SHORT-FIBERED MULCHES

Treatment	Soil Loss T/ac.	Grass Plants Per Foot	Total Cover No. of Plants Per Foot
1. 2 T. straw + 200# asphalt	19.3*	10.3	14.4
2. Short fibered wood pulp (southern) "Turfiber"	59.3	3.0	6.7
3. Short fibered wood pulp (hardwoods) "Conwed Hydro Mulch"	62.5	3.5	7.1
4. Greenwood excelsior fiber, 2 T/ac	15.3*	9.7	13.3
5. Short fibered wood pulp (Douglas fir) "Silva Fiber"	40.4	6.7	9.4

Pulps applied at 1200#/ac.

*Mean of long-fibered mulches differed significantly from mean of short-fibered mulches. 5% level of probability.

Data from replicated plots on highway fill slopes averaging 33% slope. Short-fibered mulches were applied with a hydroseeder, in a slurry of seed fertilizer and mulch. Long-fibered mulches were applied with a mulch blower immediately after hydroseeding. Plots, near St. Paul, Minnesota, were seeded in July. Erosion measurements were taken approximately 3 weeks later. Total rainfall in that interval was 3.7" in 7 different events. The greatest single event was 1.4 inches of rain received July 30. Seedling counts of grass and other plants were made in September, and total cover count was done the following June.

Data presented by D. L. Kill and L. E. Foote at the 1969 Winter Meeting of American Society of Agricultural Engineers at Chicago, Illinois.

Prepared by:
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