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FIBROUS MULCH

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This invention relates to a mulch for promoting the germination and growth of grass seed and other seed-propagated ground covers.

While the mulch or cover of the present invention is useful in establishing a stand of grass on flat and rolling plots of ground, its greatest utility is in connection with the seeding of the steeply sloped banks of highways cuts and fills, which are particularly subject to erosion.

One of the commercially practiced methods of establishing grass on highway slopes is to spray the area with a slurry of grass seed, fertilizer and wood fibers. A particular wood fiber used for this purpose is a green dyed fiber sold by the International Paper Company under the trademark "Turfiber." As the wood fibers dry they cover and blend in with the granular dirt particles and tend to hold them in place but the bond is not very strong and to obtain an adequate cover for mulching purposes and to restrict erosion, "Turfiber" is applied in an amount of about 2000 pounds per acre of ground. An apparatus commonly employed for this type of seeding and mulching operation is one known as a Hydroseeder which consist of a tank truck of about a thousand gallons capacity with a circulating pump and water turret for spraying the mixture onto the slope. Because of the fact that wood fibers tend to clump together even when wet, the nozzle of the turret becomes clogged when more than about 330 pounds of fibers are dispersed in the 1000 gallons of water and thus to apply the required 2000 pounds of wood fibers to an acre of ground necessitates the use of about six truck loads of the water mixture. From the site of the project, a trip of several miles is often required to get the water and mulching ingredients. Thus it will be seen that seeding and mulching in this manner is none too satisfactory and is costly, even though considerably more economical than some other methods.

It is the primary object of the present invention to provide a mulch and erosion protection cover which can be economically applied and which mixes with the dirt granules and bonds together so firmly in an open irregular latice-like structure that only a relatively light or thin covering is required.

According to the present invention the cover comprises randomly arranged water-insoluble hydrophilic fibers which have the characteristic of strongly bonding to one another after being initially layed from a water slurry. Fibers useful for this purpose are described in U.S. Patent No. 3,156,605 issued November 10, 1964 and other but similarly useful fibers are described in British Patent No. 945,306, published December 23, 1963. The particular fibers which have been found to be useful are hollow or tubular fibers of regenerated cellulose having a relatively thin wall (preferably an average wall thickness of not more than three microns as described in the above mentioned U.S. patent) and a width or breadth at least ten times the wall thickness. Such fibers have a water retention, that is the ability to retain water, at least about double that of a solid fiber of like mass and

composiion and this in itself is a big advantage in a mulch. Moreover, these thin walled hollow fibers, when wet and limp offer relatively large surface areas and as the water evaporates strong hydrogen bands are established between overlapping or crossing fibers whereby a high-strength web is produced.

The thin-walled hydrophilic regenerated cellulose fibers are readily dispersable in water and because of the better bonding a much less weight of fiber is required to give erosion protection than is the case with wood fibers. However, at least at the present time, these fibers are relatively expensive and it is probably not economically feasible to use such fibers alone. It has been found that a mixture of wood fibers with about 5% thin-walled hollow fibers will provide a cover equal for erosion protection purposes to that of twice the weight of wood fibers alone. Thus a mixture of 1000 pounds of wood fibers and 50 pounds of thin-walled hollow fibers of the type described in the above U.S. patent will provide a cover for one acre of ground equivalent to that of 2000 pounds of wood fibers alone. This fiber mixture is deposited on the ground in the same manner as the wood fibers alone, that is to say a slurry of fibers, grass seed and fertilizer is pumped or sprayed from a tank truck. Since the weight of the fiber mixture is only about half the weight of the necessary amount of wood fibers alone, only about half as many trips need be made for water and the labor cost is therefore considerably reduced. The thin-walled hollow filaments not only bond to themselves as they dry but also bond to the wood fibers, so that the entire fiber cover is effectively held together.

Preferably, all the fibers are white rather than green or other dark color inasmuch as the white fibers reflect the heat of the sun and prevent the seeded area from becoming too hot. Of course in those parts of the country where it is normally cool, or in naturally shaded localities it may be desirable to use colored fibers and the thin-walled regenerated cellulose fibers may readily be produced in any color that may be desired. Preferably also the fibers should be as long as the spray nozzle is able to accommodate without clogging; thus far, fibers ranging from one-quarter to one-half inch long have been found to be effective, although fibers of greater length are also feasible.

The cover laid down as described hereinabove conforms to irregularities in the ground and clings closely to the ground so that no staking is required to hold it in place. It does not have to be removed inasmuch as the grass readily penetrates the open character of the cover. The fibers separate in time due to the ravages of the weather and gradually penetrate and become a part of the turf.

Applicant is aware of the fact that ordinary rayon and other cellulose fibers have been proposed for this use but they have never been effective for preventing erosion on slopes because they do not adhere together with sufficient strength to form an integral web. The thin-walled hollow fibers as described in the above referred to patents have the unique property of bonding very strongly when laid together from a water suspension and subsequently dried and even more importantly the bond retains considerable strength when the fibers are subsequently rewetted.

Having thus described the invention, what is claimed is:

1. A method of impeding soil erosion and promoting plant growth comprising depositing on the soil a cover comprising randomly arranged thin-walled water-insoluble hydrophilic fibers having an average wall thickness not

exceeding about three microns and a water retention of at least about double that of a solid fiber of like mass and composition.

2. The method set forth in claim 1, wherein wood cellulose fibers are deposited along with the thin-walled water-insoluble hydrophilic fibers, with the water-insoluble hydrophilic fibers constituting about 5% of the total weight of the deposited fibers.

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