

Seedbed Protection

Various types of mulches are available to offset the ravages of wind, rain and erosion

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When a new 18-hole golf course has been designed, built, graded, fertilized, and planted, there is a sizeable investment wrapped up in those naked slopes, not counting the cost of grading and working the materials into the seedbed. An estimate of 30,000 dollars is not an unreasonable figure for just the seedbed. It is equivalent to a 30,000 dollar gamble that nature will be kind and gentle so that the grass will grow quickly, so that play can start and revenue begin to flow in. "Nature in the raw is seldom mild." A sudden rainfall, and a cloudburst, a heavy windstorm and all the work and the investment can be swept away within minutes. Unusual? Not a bit of it.

In 1961 we visited a course that had been refertilized and reseeded for the third time because of water erosion. At Miami, we learned of a new planting that blew out of the ground by windstorms three times before the grass got thick enough to hold the soil. In Las Vegas the same thing happened. In the Midwest, a beautifully designed course had such severe washouts that opening day was delayed nearly two years! The cost in loss of revenue was fantastic.

Once construction of a golf course is started it seems that everything must be expedited to get it into play as quickly as possible. Too often there are corners





Unchecked erosion on newly planted fairway is costly, unsightly. This is minor damage compared to some.



Straw mulch on left promoted rapid growth of Merion and Pennlawn. Earthworms "bunched" the straw and anchored it.



Plot mulched with cereal straw. Dark streak in center shows overlap of fertilizer. Seedbed received 5-6 lbs. of actual nitrogen per 1,000 sq. ft. from urea-form.

that are cut too sharply so that the end result actually delays opening day. It is so important to build it right the first time. When a new course has to be rebuilt within a year or two after opening, the members are justified in rebelling.

We shall do no more than to mention the factor of good drainage which everyone knows is essential to high-quality turf. In addition to a well-drained soil and an adapted grass, the essential ingredient in the recipe for getting a grass established so that it may be put into play as soon as possible is a continuously-adequate supply of nutrients in the seedbed. Calcium, phosphorus, potash, and nitrogen are the Big Four that assure adequate nutrition for the developing grass.

Chemical Requirements

Agricultural ground, dolomitic limestone sufficient to bring acid soils to a pH range of 6.5 — 6.7 will supply ample calcium and magnesium for two to three years or more. Phosphorus and potash requirements can be met simply and economically by incorporating deeply into the seedbed an 0-20-20 at 1,000 lbs. to the acre or an 0-25-25 fertilizer at 800 lbs. to the acre. Nitrogen can be supplied effectively in the seedbed either through the use of a nonleaching, controlled-release material such as solid granular ureaform at rates of supply 6-8 lbs. actual per 1,000 sq. ft. or other materials in smaller quantities. This ample supply of nitrogen, which will be gradually released to the developing grass plants in accordance with their needs, is the most important single factor in rapidly developing a useable turf in the shortest possible time.

It is no more than common sense after making a heavy investment in the future to provide some sort of insurance. Floods, cloudbursts and wind constitute the main hazards which can nullify all efforts and expense incurred to this point. Irrigation can partially offset losses by speeding germination and establishment. Water falling on naked, unprotected soil quickly can puddle and seal the surface, effectively preventing water infiltration and greatly increasing surface runoff with accelerated erosion. Unwatered areas depend on natural rainfall which, at best, is quite unpredictable. Seeds may lie dry in the soil for weeks before rain comes to insure the stand. If it comes as a downpour, everything may end up in the river.

A paint manufacturer uses the slogan
(Continued on page 52)



Bantam hydroseeder spreading seed, fertilizer and Turfiber on Eglin AFB (Fla.) course.



This site is getting a bath of Turfiber and asphalt emulsion for anchorage of seed in a gully.



Slope on Avon Fields GC in Cincinnati is being patched with seed, fertilizer and Turfiber mixture.

"Save the surface and you save all." Essentially this is true of seedbeds. Any kind of seedbed protection is designed for temporary effect to (1) hold moisture for accelerated germination and establishment; (2) to lessen the impact of falling drops of water and to let water trickle into uncompacted soil; (3) to retard lateral movement of excess water which would cut gullies or remove surface soil by sheet erosion; (4) to reduce wind velocity at the surface which, if unchecked, physically removes soil, seed, and fertilizer.

Use of Straw

Various types of straw have been used for many years as mulch to insure turf establishment and prevent erosion. In areas of use, one can secure straw from wheat, oats, barley, and rye, and soybeans. In coastal areas marsh or salt hay may be available. Chopped stalks from corn or sorghum may be obtainable. In pine wood areas, the needles can be gathered and spread. Most materials in this class are relatively inexpensive. They rot down quite rapidly into the soil and rarely need to be removed after the grass comes up.

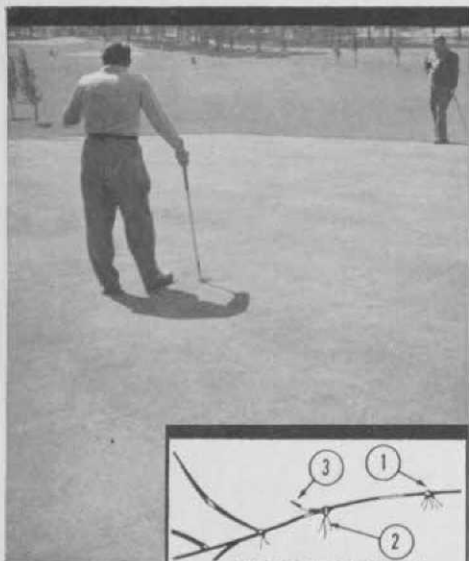
Highway seedings made with a hydroseeder generally are covered at once with some kind of straw mulch that is chopped and blown in place with a special power mulch blower. Hot liquid asphalt emulsion may be sprayed into the straw as it is being discharged from the blower pipe to "tack" the straw together and reduce wind blowing. This is particularly true on slopes.

Introduces Weed Seed, Etc.

Straw mulches must be applied as an additional procedure after liming, fertilizing, and seeding. The extra cost leads many builders to gamble on getting the turf safely rooted without severe loss. The disadvantage of much cereal grain straw is that it carries unthreshed grain and, often, weed seeds, some which may be troublesome, noxious and highly undesirable. Straw-covered areas are subject to being burned off, accidentally or otherwise. This factor has caused straw mulches to be deleted from highway specifications in populated areas.

On the credit side, it must be recorded that grass develops rapidly under a good straw mulch that has been properly applied. Moisture is retained with high efficiency and both wind and water move-

(Continued on page 124)



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71. Three holes each measure 500 yards or more. The longest is No. 16, which is 552 yards and requires a drive across Husband's Creek. No. 18 crosses both branches of the creek. The back 9 was cut out of a wooded area considered to be the most beautiful part of the course.

In designing DuPont, consideration was given to the accommodation of spectators for tournaments. Within a radius of 200 feet in the center of the course, it is possible to watch the action on three tees and three greens. When the DuPont course was built, adjustments were made to the older Nemours course to make the starting and finishing holes accessible to the new clubhouse.

This then is the DuPont Country Club, a unique employee recreational facility, sponsored by management but run by the employees. Perhaps all companies cannot afford the scope of the DuPont golf operations, but the guidelines are nevertheless there for some phases of it to be adopted by other industrial firms seeking to help satisfy the hunger for golf and provide extra fringe benefits for employees.

Seedbed Protection

(Continued from page 52)

ment are retarded. The rotting straw adds organic matter to the soil.

A tool known as a "Wheat Land Packer" often is used on loose seedbeds and flat slopes to "tuck" straw into the soil where it is anchored against movement with a portion left protruding to reduce wind and surface water movement. This method is particularly useful for large flat slopes on the golf courses.

Nets — Cloth Mesh

When "gunny sacks" were cheap and plentiful they would be split open and used to cover new seedlings. They were very effective, but it was necessary to remove them at just the right time to avoid smothering the tender (often yellow) grass seedlings. If the hot sun hit the new grass just right, it meant seeding all over again. Rots and molds often made the sacking completely unfit for re-use. Cheesecloth sometimes was used to mulch new seedlings.

The natural outgrowth of the use of burlap sacking was the development of a similar material with larger meshes to lessen the cost and to let the developing grass have more sunlight. It was optional



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whether to leave the erosion-resisting net in place to rot away under the grass, or to carefully remove it so that it could be used in another location. Today, we have a specialized net called "Mulchnet," an inexpensive wide mesh paper fabric designed to be rolled out on top of a straw mulch to hold the straw in place. It can be tacked down with long metal staples. Another fabric is called "Erosionet" which is to be rolled out on seedbeds after fertilizing and seeding. It replaces straw and devices to hold straw in place. The open mesh fabric made of twine forms millions of tiny dams that catch water and soil and hold the seed and fertilizer in place.

Performs Several Functions

A highly specialized fabric or grass blanket called "Troyturf" has been on the market for years. When it is rolled out on a smooth graded soil surface it performs these functions: (1) controls erosion (2) furnishes starter fertilizer (3) has the Blue Tag certified seed imbedded in the mesh along with an organic "potting soil" and a controlled-release source of nitrogen. In practice the blanket (in wide

rolls) is rolled out on the graded soil, secured with staples, watered and rolled to bond it to the soil surface and to start the seeds germinating. Any kind of seed can be incorporated into the mat. Everything needed for successful growth, even on subsoil, is incorporated into the blanket.

Recently, a heavy jute fiber net has been developed for lining the bottom and sides of ditches and flumes where a strong flow of water is anticipated. Another material now in experimental installations is a Fiberglass blanket which so far promises little in connection with grass seedings.

Asphalt Mulch

In this process a special type of cut-back asphalt is sprayed on the fertilized and seeded area. Upon exposure to air, the asphalt hardens and forms a lattice-work "skin" over the soil. Air and moisture can move into the soil through the protective covering and seedlings have no difficulty in finding ample openings into the atmosphere. No detrimental chemical effects have been noted. Where excessive



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quantities are involved, the soil surface may be sealed so grass cannot emerge.

Elastomeric Emulsion Spray Mulch

The Alco Company has developed and tested a material known as Soil-Set, a product of polymer chemistry. It is a water-diluted polymer emulsion which is sprayed on a fertilized and seeded area with ordinary spraying equipment. Heavy rains are caused to run off without erosion damage, yet the insoluble rubbery "skin" is coarse enough to insure germination. Moisture in the soil is condensed under the covering (as under the polyethylene sheet) and not allowed to evaporate. Under certain conditions of intense heat and direct sunlight, the darker-colored films may absorb so much heat that germinating seeds may be damaged. Lighter colored film will reflect the heat and keep the soil cooler. The film over the soil gradually decomposes and leaves a granular, absorptive surface. As the grass grows and covers the soil the film disappears. Advantages of this rubbery "skin" are: (1) it is nonflammable; (2) has no weeds; (3) is chemically inert; (4) is non-toxic; 5) there is no induced nitrogen deficiency. Tests are in progress to determine the value of Soil-Set for treating

newly planted sprigs and stolons.

Wood Cellulose Pulp Mulch

One of the more promising methods now in use on courses and highways employs the Finn Hydroseeder (a familiar machine in highway slope seedings) and a wood cellulose pulp, a product of the paper industry. International Paper Co. has conducted research and many successful demonstrations with its Turfiber on courses, highways, and lawns. In practice, the hydroseeder of 500 gals. capacity (some hold 1,000 gals.) is filled with water. Into this tank is dumped the dry, fibrous, green-tinted wood cellulose pulp at a rate to supply 1,000 lbs. to the acre. Fertilizer is added, then the seed, also limestone, if soil tests show the need. Agitation with an impeller is continued until the tank is filled with a homogenous slurry (soup). The powerful engine on the hydroseeder then forces the slurry through a specially-designed pump. The operator directs the discharge nozzle so that the spray covers the prescribed area uniformly. Thus, in one operation, a prepared seedbed can be limed, fertilized, seeded and mulched. No further attention is necessary.

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In a prepared newspaper release an officer of International Paper Co. made no claim that Turfiber would control erosion, indicating that its principal use is to form a protective porous "felt mat," which insures moisture and rapid germination and establishment. But in actual practice, it has been noted that erosion is checked to high degree where the Turfiber installation has been properly made.

One use to which this new method has been put is in covering newly planted stolons of bentgrass or sprigs of Bermuda-grass. Unless vegetatively planted grasses are kept moist continuously, their establishment can be severely retarded by drying periods, even of short duration. The cellulose fiber cover retains moisture and eliminates the need for constant watering.

Research Reports

Richardson & Diseker, studying control of road bank erosion in Northwest Georgia, reported in the *Agronomy Journal*, Volume 53, No. 5, that they used several mulch materials for temporary protection of initial stand establishment of several grasses and legume species. Crop straw mulches at 1 and 2 tons to the acre after seeding improved the stand and

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growth of most plants by anchoring the seed, reducing fertilizer losses, and insulating seedlings against frost damage. "The protective effect of mulches by absorbing raindrop impact and lessening both sheet and rill erosion were outstanding when heavy rains followed shortly after seeding," they reported.



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One part of Solexto in 400 parts of water sprayed on two to four acres gives season-long control of beetle grubs, ants, crickets, chinchbugs, cut worms, rose chafers, chiggers, fleas, ticks, mosquitoes and many other pests.

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One application of Solexto, two gallons to the acre (1-to-200 solution), grub-proofs the turf for at least ten years. Thus moles are also kept out by eliminating their food source.

ECONOMICAL COVERAGE

Because such high dilutions are possible, extensive coverage is very economical. Labor can also be saved by using EWT Weed Killer* in the same solution for general spraying of the grounds.

* Widely used selective weed killer manufactured by Dolge.

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Bob Karbatsch (r), pres. of the Rocky Mountain GCSA, recently presented a plaque to Oliver P. Hutchinson in tribute to the great work the latter has done for the supts' organization over the years. Hutch is 75 years old and has been a course supt. for nearly 50 years. He recently retired as green-master at the Willis Case GC in Denver and is working at Columbine CC.

The authors rate cereal grain straw first for effectiveness then, in order, jute bagging, paper mesh and grass mats. Plastic sheets required special handling, particularly prompt removal before seedlings were damaged by high temperatures. "The sprayed-on latex material appeared promising in initial tests in the spring of 1960. Prior to seed germination it formed a temporary protective film which gradually disintegrated, permitting stands to develop."

Matching the Pro and Club

(Continued from page 38)

After the job is defined, the qualifications of the pro to fit the job must be appraised. The candidate's education, references, experience and personality should be checked. His financial background should be investigated.

Hanna observes that there is need for more education of the young professionals in teaching methods, psychology, accounting, merchandising and advertising and business English.

Points To Be Checked

Bill Sherman, western field representative of the National Golf Foundation, summarizes the pro hiring problem:

(1) What type of professional is needed at the course?

Promotion and membership sales abilities.

Teaching and creating or reawakening of golf interest.