

BRINGING BACK THE GRASS

Damaged grass can be rejuvenated in any number of ways. Renovation through aerification and overseeding might cure your damaged turf.

by Jim Mello



Drum-type aerators use the weight of a heavy tractor for good penetration. They will aerate a large area quickly.

In turfgrass management, the answers aren't always easy. Turfgrass managers may turn to the spray gun or spreader, but still not solve the problem.

Fertilizers, fungicides, insecticides and herbicides handle many problems, but they won't bring dead plants back to life. Renovation, through aeration, may be necessary.

The first step is to identify the problem. Ask yourself these questions:

Is the problem due to poor grass selection?

Is it due to improper cultural practices?

Is it due to insects, disease, thatch or compaction?

The next step is to weigh the alternatives. Should existing turf be killed? Will aerification and overseeding do the job? Should a slit-seeder be used?

Identify the problem

Improper variety selection can be the

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basis for turfgrass decline. Fine fescue, basically a shade-tolerant grass, will do well in the full sun of a cool climate, such as western Canada. However, when fine fescue is grown in the sun under warm temperatures, like southern California, it has difficulty surviving.

Warm-season grasses such as Bermuda or zoysia do well in the southern U.S., but they lose color north of the transition zone.

In New England, many old lawns have been seeded with common Kentucky bluegrass varieties. In the cool, moist climate, leaf spot disease flourishes, thinning out many turf areas. These areas should be renovated to improved bluegrass varieties, resistant to leaf spot.

Cultural practices

Improper cultural practices set the stage for many problems. Any procedure performed on turf which causes stress invites unwanted pests to attack the predisposed turf.

Close mowing, improper irrigation, poor fertilization practices, chemical injury, heavy wear, soil

compaction, excessive thatch accumulation, extreme air temperatures and drainage problems are some of the stresses which weaken turf and encourage problems that have to be remedied through renovation.

A healthy lawn or fairway which contains a high percentage of broadleaf weeds or annual grasses can be corrected through the proper selection and application of herbicides. Applying a broadleaf herbicide or pre-emergence annual grass control can maintain that area weed-free.

Certainly this situation would not call for renovation unless the desirable grass species remaining are not maintaining a dense cover. In this case, the introduction of seed would provide new plants.

Other factors

Insect damage can seriously thin turf. Insects should be identified to learn what type of insects (sucking or chewing) and which plant parts are affected. For example, the greenbug aphid will attack the leaves of Kentucky bluegrass, piercing cells and sucking out the leaf juices.

In many cases, the application of an insecticide in combination with nitrogen will stop further damage and promote new top growth. Seeding would not be necessary.

Damage to roots and crowns by white grubs, billbugs and ateniids will cause complete loss of turf areas. After an insecticide is applied to stop further damage, renovation is necessary to regain a healthy grass stand.

Be aware that not all damage by insects requires renovation. Give the turf a chance to recover and then renovate bare areas.

Diseases cause various symptoms in turf, ranging from slight discoloration to death. Whether total kill has come from fusarium blight in bluegrass, anthracnose in annual bluegrass or spring deadspot in Bermudagrass, the only solution to dead turf is replanting.

Fungicides are a great preventative tool, and the high cost can be justified when putting green quality maintenance is involved. But when we main-

tain large areas, such as home lawns or parks, the cost of fungicide use becomes prohibitive.

When cultural procedures, such as proper mowing and watering, cannot keep a turf area from fungal infection, rejuvenation through renovation becomes the most economical alternative. Proper diagnosis of the disease aids in selecting the proper varieties for the reclamation process.

A weed is simply an out-of-place plant. In Tulsa, Okla., annual bluegrass is a weed in a Bermudagrass lawn, but in Cincinnati, Ohio, Bermudagrass is a weed in an annual bluegrass fairway. Weedy grasses, such as quackgrass, annual bluegrass or nimblewill are objectionable because of their variations in color, growth habits and competitiveness. Once a perennial grass species invades, a non-selective herbicide must be used to kill the unwanted vegetation.

Renovation alternatives

Before starting to restore problem

turf, examine alternative programs. If a golf course fairway needs renovating, would the program interrupt play?

If renovating a large area for a public park, how tight is the budget? Can the homeowner justify the expense involved in alternative renovation programs for their troubled landscapes?

Dethatching and overseeding

Many turf areas are being reclaimed through dethatching or power raking and overseeding. A dethatcher or power rake has a set of blades of spring teeth, which cut or comb the thatch, bringing it to the surface. To prepare a seedbed effectively, the seed must come in contact with the soil. Dethatchers will bring a great deal of debris to the surface, but if there is a severe thatch layer, the blade will not penetrate completely down into the soil.

Dethatching should be repeated, removing as much of the thatch layer
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Slitseeding to the rescue

Sometimes turf is so severely thinned that core aeration and overseeding will not provide enough plants to recover the declining area. In this case, the slitseeder can be used to incorporate seed in rows without completely stripping the area and starting all over.

The grass should be mowed short to reduce the debris brought to the surface. The slitseeder will bring matted grass and heavy thatch to the surface.

After the renovation is completed, this material should be raked or scraped up.

Whenever seeding is done, proper placement of the seed in contact with the soil should be given the utmost priority. If moisture, light and temperature favor germination, a seed may germinate in the thatch but its survival potential in this porous medium is low.

By using the slitseeder, seed-to-soil contact is assured. The machine has a set of blades in front which cuts grooves through the thatch down into the soil.

A set of disks located behind the blades keeps the slits open while seeds flow from a seed hopper through a small tube into the slits at the base of the disk.

The slits are two to three inches apart, close enough for the new plants to fill in rapidly. The slit-

seeder also cuts through the thatch layer, providing an avenue for the new seedling to grow through. This vertical cutting action also stimulates new growth.

Rhizomes and stolons of the existing turf are cut and new shoots grow from uncovered nodes and growing points.

New seed varieties can be incorporated without severe surface disruption. Slitseeding followed by core aeration provides excellent results because the surface has been mechanically modified to favor new growth and development. The seeding rate would vary depending on the various weights of the different species. The rate of seed flow is easily adjusted to compensate for seed size and weight.

An advantage is that the area renovated by slitseeding is never out of service. The area will look as if it has been renovated but it will still be firm and usable. In fact, entire fairways on golf courses have been changed from one variety to another without any interruption of play.

One disadvantage of slitseeding is the impatience of some people eager to have a beautiful turf area. A beautiful turf from seed or slitseeding takes longer than laying sod.

Your potential slitseeding customer must be informed that it will

take the seed months to fill in and form a dense turf. The homeowner also should know they may have to look at weeds during the recovery period when herbicides can't be applied.

Another challenge to slitseeding is irrigation systems. You have to make sure they are not damaged. Marking all the sprinkler heads and valves with marking paint or short stakes makes visibility simple.

Timing

Timing of the slitseeding process is critical for proper establishment. Slitseeding cool-season grasses does not do as well in the spring as it does in the fall. Cool soil temperatures in the spring prolong the germination time and the existing sod grows vigorously during the cool, moist season.

The soil beneath the sod warms much more slowly than the bare soil which readily absorbs the sun's heat and light. The competition from the established grass reduces the chance for the new seeds to develop.

Pre-emergence herbicides to control spring and summer annuals cannot be applied because they will inhibit the growth of the new seedlings. The physical opening of the turf provides an opportunity for
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at one time, without tearing out the entire sod layer. When a heavy thatch condition develops, crowns and other parts of the plant grow in the porous, organic layer, creating problems. The thatch, because of its physical nature, does not provide a satisfactory growth medium.

To dethatch an area totally, (removing all the dead organic matter), could leave the area with hardly any plant growth left.

By repeating the dethatching procedure many times, removing a portion of the layer each time, allowing time for recuperation between each dethatching, eventually the desired thickness of the organic layer will be reached.

This program involves many hours of labor for both machine operation and cleanup time. If the thatch layer is thick the seed will lay on top of the thatch and its potential for establishing itself is not great.

If the thatch layer is not thick, then

the dethatching units can cut through and expose the soil for seeding. In this case, dethatching the area once to break up the layer and removing the debris is all that is necessary. Seed should then be broadcast over the entire area, and the dethatching process should be performed again to incorporate the seeds in the soil. One of the greatest benefits of the dethatching units even when they can not fully penetrate the thatch area is their vertical mowing action.

Once the thatch depth is under control, routine dethatching will keep the layer to minimum reducing plant stress. Dethatching, however, does not have any effect on relieving soil compaction in established turf. This can only be accomplished through aeration. Dethatching should be scheduled for fall, reducing the incidence of annual grasses and broadleaf weeds.

If a pre-emergence crabgrass herbicide has been applied the cutting

action of the dethatcher will break this barrier and bring about a potential weed problem.

Dethatching is one form of renovation which should be used as a preventative measure rather than a cure for heavy thatch. To reduce a two-inch thatch layer properly to a quarter inch or to prepare a favorable seedbed requires numerous efforts.

Core aeration

Interfacing soil problems, heavy thatch and poor rooting hinder the normal growth and development of a sodded area. Reduction of these stresses can be achieved through core aeration on a yearly or bi-yearly schedule. Core aeration involves the removal of a soil/thatch core two to three inches deep over the entire problem area. Coring breaks up the thatch layer, allows water to penetrate into the root system and gases to flow freely in and out of the root zone. Coring breaks up the serious interfacing

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weed seed to grow and develop.

Post-emergence herbicides should not be applied because of damage to the young seedlings. If you live in an area where summers are hot and dry, the young seedlings which germinate in late spring will not have developed their root systems.

Their survival through stress periods, therefore, depends on faithful watering to keep them alive. This could mean numerous waterings, perhaps even daily, if drought and high temperatures persist.

Slitseeding in the fall is best. Pre-emergence and post-emergence herbicides can be applied in the spring. In late summer when cool-season grasses are growing slower (which will reduce their competition with the new seedling) the high temperatures will promote rapid germination. The cool and moist fall period provides a favorable environment for the young seedling to survive.

Both pre- and post-emergence chemicals can be applied the following spring since the plant will have matured.

By the time the summer stress period approaches, the plant will have a developed root system, which requires less water and is prepared to face the heat and drought. An old diseased or insect-riddled turf area now takes on new



Slitseeding can help revive worn areas on athletic fields.

life as the improved varieties take over.

Warm-season grasses

Warm-season grasses in the South are often overseeded during winter to provide a green turf full-season. The strong lateral growth of Bermuda grass, zoysia and St. Augustine grass, benefits greatly from annual vertical mowing. Using a slitseeder, the vertical mowing and

the overseeding can be done in one operation.

By using the slitseeder, different varieties can be used by simply adding the seed to the hopper. Shade areas can be seeded with shade-tolerant grasses, while heavy-wear areas can be seeded with wear-tolerant species. Selecting the right seed for environmental conditions assures success in establishment.

—Jim Mello

Spoons or tines?

It's a question that faces many landscape managers. Proper aeration is an important turf management practice, one with numerous benefits. Finding the right aerator for a particular job can be the key to proper aeration.

There are two basic types of coring devices: the open spoon tine and the closed, hollow tine. With aeration, says Paul Harder of Prescription Turf Services, Middleton, Mass., the primary concerns should be the number of cores per square foot and the depth.

From a turf management standpoint, he doesn't see much difference between the two types of tines. However, he does say the open tines are more useful when doing slicing or overseeding because they bring up more soil which acts as a top dressing.

The major difference seems to be cosmetic. The hollow tine makes a cleaner hole. "I favor the hollow tine because it does a neater job," Harder says. "When the job is done it looks clean."

Jerry Faulring of Hydro-Lawn in Gaithersburg, Md., echoes this feeling. He has used both, and, he says they do a comparable job. Again the only difference is cosmetic.

"A spoon kicks out the core better," says Stan Zontek of the USGA Green Section in West Chester, PA.

Brian Bossard, field manager at San Diego's Jack Murphy Stadium, prefers spoons. "They keep clean better." He adds, though, that hollow tines make a cleaner hole. He uses half-inch hollow tines on the stadium field.

The depths of hollow and open don't seem to vary much either, notes Harder. Penetration depth is dependent of soil conditions at the time of aeration. If the ground is hard, neither type of tine will penetrate well.

A problem arises just below that aeration zone, though, Zontek says. At about four inches deep, researchers have found a layer of compaction caused by the aeration. A task for researchers in the future, Zontek says, will be to develop an aerator that can break up that layer.

He says slicers with blades much like Bowie knives, nine-inches long, are being experimented with in Europe.

And while the perfect aerator has yet to be developed, a number of researchers are taking a poke at it. Results should be coming out soon.

—Jeff Sobul

ing problem of soils with unlike physical properties.

The greater the porosity the more room for the roots to grow and develop. In a tightly compacted clay under-soil, roots have very little room to grow. The roots prefer to stay at the surface in the porous peat or loam soil brought in with the sod. Core aeration creates large pore spaces which rapidly fill in with turf roots. This greatly increases the turf's vigor, drought tolerance and overall health.

Large core aeration units are available for vast turf areas such as parks and fairways. On the home lawn, a smaller unit is needed to maneuver the equipment in tight places. The unit should also be capable of being raised or lowered for driving over sidewalks and curbs.

To properly core aerify, the unit must have the capability of penetrating deeply. The soil should be moist to provide the deepest penetration. Dry soil does not permit this and aerating wet soil can make quite a mess.

Heavy, fine-textured clay soils are more difficult to penetrate than sandy loam soils. Many core aeration units are on the market, but you must select the one which is capable of penetrating the particular soil to be aerated.

Drum-type aerators work fine as long as enough weight is provided.

Roots do not grow in soil; roots grow in spaces between soil particles.

The punch-type aerators are not dependent on weight and usually offer the best aeration; however, it requires more maintenance to keep them operating.

With the sod fully opened, overseeding efforts will provide excellent results because the seeds will come into contact with the soil. The soil

cores brought to the surface are broken up by rains and provide a top dressing rich in soil microorganisms which biodegrade thatch into valuable plant nutrients.

The soil brought to the surface also makes a favorable seedbed into which new varieties can be incorporated. This process should not be called dethatching, but more appropriately thatch modification. The intermingling of the soil with the thatch favors decomposition and alters the physical structure of this organic layer. With soil core removal water can now penetrate the surface easily, fertilizer can move more readily to the root system and gases and heat exchange can take place. New varieties of turf can be incorporated for a move away from the less desirable monoculture and toward better disease resistance.

With warm-season grasses, the benefits also include a source of new plantings. Each soil core removed contains viable nodes which can give rise to new plants. These sprigs can be collected and used to establish grass in problem areas or in new places where vegetation is needed.

Golf course superintendents have established nurseries by collecting these plugs, piling them two to three inches deep, raking them level, rolling, fertilizing and watering. New growth begins immediately.

Core aeration done on a routine basis can help to restore many declining turf situations. Coring should be considered before reaching for a solution on the chemical shelf.

Shatter core aeration

Shatter core aeration (solid tines) is relatively new. It involves the penetration of the thatch soil zone without the removal of a core. This can be used as an immediate remedy to a severe thatch layer or poorly drained tight soil to open up the surface and allow for infiltration of water, nutrients or pesticides.

It does not relieve compaction but it has a shattering effect which, depending on soil type, may stimulate growth. More research work needs to be done in this area and more reports from the field are needed to assess the benefits to turf from shatter core aeration.

At some point all turf professionals must deal with the challenge of declining turfgrass. By sharing ideas at seminars, field days and conventions, we can keep up with our growing and everchanging field and upgrade the professionalism in turfgrass management. **LM**