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Calendar of Events

Rutgers University Athletic Turf Classes

* February 24-26 Athletic Field Construction and Maintenance course
* March 9th The Importance of Understanding Athletic Field Soil
* March 16th The Importance of Understanding Athletic Field Turfgrass
* March 23rd Understanding Athletic Field Construction Procedures

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Rutgers Corner
A look at perennial ryegrass for New Jersey sports fields

by Brad Park, Rutgers University park@aesop.rutgers.edu

The question of whether or not to establish and/or overseed perennial ryegrass on sports fields is an issue sports field managers in New Jersey face every year. Perennial ryegrass is an attractive choice for fields used for soccer, lacrosse, field hockey, and football because it has the ability to germinate and establish quickly when overseeded and can show good traffic tolerance if a proper variety is chosen. However, the susceptibility of perennial ryegrass to winter ice damage and numerous diseases has led many sports field managers across the Garden State to establish Kentucky bluegrass and/or tall fescue as an alternative(s) on their sports fields.

The case for perennial ryegrass

Along with a darker green color, increased shoot density, and finer leaf texture, many new perennial ryegrass varieties contain fungi called 'endophytes' that improve tolerance to the damage caused by surface feeding insects including billbugs, sod web worms, and chinch bugs. The mutually beneficial (symbiotic) relationship between the fungus and perennial ryegrass is an effective method of biological control of insects and the establishment of 'endophyte-enhanced' perennial ryegrass varieties is an integral part of an Integrated Pest Management (IPM) program.

Perennial ryegrass tends to be more tolerant of postemergent herbicides compared to Kentucky bluegrass, therefore allowing for higher application rates. For example, Acclaim Extra is a herbicide labeled for the selective postemergent control of crabgrass in perennial ryegrass and Kentucky bluegrass. The Acclaim Extra label clearly states that no more than 0.64 oz per 1000ft^2 of product may be applied to Kentucky bluegrass per application where as up to 0.90 oz per 1000 ft^2 may be applied to perennial ryegrass. Similarly, Prograss, a herbicide labeled for the selective postemergent control of annual bluegrass in Kentucky bluegrass and perennial ryegrass, may be applied at1.5 oz per 1000 ft^2 to Kentucky bluegrass with a minimum 6-week Kentucky bluegrass overseeding safety interval whereas 2.0-4.0 oz of product per 1000 ft^2 may be applied to perennial ryegrass with only a 1-2 week perennial ryegrass overseeding safety interval.

The strongest argument in support of perennial ryegrass use on New Jersey sports fields was detailed by Brede and Duich (1982) where they note that perennial ryegrass will germinate in as little as 4 days, grows and develops

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quickly, and tolerates moderate amounts of wear within a few weeks of germination. Recent data collected at Rutgers involving applying traffic (wear and compaction) to varieties and selections comprising the 1999 National Turfgrass Evaluation Program test has revealed a number of commercially available perennial ryegrass varieties demonstrating good tolerance to traffic. Following applications of wear and compaction from August through November 2003, 40 perennial ryegrass varieties and selections (134 total entries) were shown to be the top performers when assessed for turfgrass quality under traffic. Of the 40 top performing varieties and selections, the following commercially available varieties showed mean turfgrass quality[1] ratings of 5.7 and above (Quality is assessed on a scale of 1-9 where 9=highest quality): SR 4500 (6.7), Citation Fore (6.3), SR 4220 (6.0), Racer II (5.7), SR 4350 (5.7), Galaxy (5.7), Catalina II (5.7), Line Drive (5.7), Pacesetter (5.7), Sol (5.7), and Radiant (5.7).

Perennial ryegrass limitations

Despite numerous perennial ryegrass varieties showing good traffic tolerance when evaluated at Rutgers, the bunch-type growth habit of perennial ryegrass significantly limits the recuperative potential of the species. Perennial ryegrass is limited to recolonizing divots slowly by basal tillers. Kentucky bluegrass establishment on high-use sports fields is advantageous due to its rhizomatous growth habit. Turfgrasses with a rhizomatous growth habit (Kentucky bluegrass) are characterized by relatively small divots and a more rapid recuperative potential since regrowth and recovery can occur from rhizomes under the center of the divot as well as from the sides. While divot recovery of Kentucky bluegrass sports fields may be facilitated via fertilization, damage of perennial ryegrass stands must often be accomplished by overseeding.

Perennial ryegrass on New Jersey sports fields is susceptible to prolonged cold temperatures and ice cover. McCarty (2000) found that 50% of a perennial ryegrass stand may be killed when soil temperatures at a depth of approximately 4.0 inches fall to between 23 and 5° F. In contrast, Kentucky bluegrass demonstrates far greater cold tolerance, as similar levels of kill are not achieved until soil temperatures at the same depth fall to between –6 and –22° F. Additionally, following an ice storm in 1994, many golf course fairways comprised of perennial ryegrass in the mid-Atlantic region were heavily damaged as a result of prolonged ice cover with some golf courses reporting as high as 90% turf loss (Zontek, 2002).

Perennial ryegrass sports fields are susceptible to a number of fungal diseases that can be both destructive and expensive to control if fungicides are applied. Among these diseases includes: stem rust, brown patch, dollar spot, pythium, leaf spot, and gray leaf spot. Gray leaf spot can be particularly devastating as Vermeulen (1999) stated that up to 90% of a golf course fairway comprised of perennial ryegrass may be killed if left unprotected though the use of fungicides. Gray leaf spot develops in perennial ryegrass during periods of warm days with high humidity and prolonged leaf wetness in late summer (mid-August to early October).

Conclusions

Because perennial ryegrass is such a practical and efficient overseeding choice and many varieties display good traffic tolerance, it is not appropriate to dismiss its use on New Jersey sports fields. If considering perennial ryegrass in a seed mixture or as an overseeding species, realize that perennial ryegrass grows vigorously during cool moist weather and is further enhanced by high soil fertility and fertilization. As a result, perennial ryegrass is highly competitive in mixtures with other turf species, and these mixtures often result in turfgrass stands dominated by perennial ryegrass.

There are several general strategies to minimize the onset or severity of gray leaf spot disease in perennial ryegrass in the absence of a fungicide program. Keeping in mind that gray leaf spot is most severe during warm/high humidity days in late summer, it is important to minimize turfgrass leaf wetness during these periods. One strategy is avoiding early morning and nighttime irrigation. It is advisable to examine weather forecasts and schedule "deep and infrequent" irrigation cycles on lower humidity days. As an overseeding strategy to minimize gray leaf spot, the Plant Diagnostic Laboratory at Rutgers University has been recommending overseeding perennial ryegrass following Labor Day in New Jersey. While this recommendation deviates from the traditional mid-to-late-August renovation timing, the quick-germinating and quick-establishment characteristics associated with perennial ryegrass allow for the "optimal seeding window" to be delayed. Lastly, the Rutgers Breeding program has focused much attention to selecting experimental perennial ryegrass varieties that show resistance to gray leaf spot. Several experimental varieties have shown good resistance and are expected to be available commercially in Fall '04. Choosing disease resistant varieties is an effective tool to manage turfgrass diseases and is another core component of an IPM program.

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Turf Blankets

by Jim Hermann, CSFM

Give your turf a jump-start in the early spring by installing turf blankets. Understanding the principles involved in soil temperature manipulation is a key component in getting the most benefit out of your turf blankets.

The basic concept behind utilization of turf blankets is to increase average soil temperatures beneath the blanket at an accelerated rate as compared to uncovered turf areas. This increase in soil temperature stimulates an earlier growth response in the turf.

Soil surface temperatures respond closely to what could be called the temperature budget. If more heat is gained in the soil than is lost there is a net rise in temperature. If more heat is lost from the soil than is gained there is a net loss in temperature. There are two major recurring heat cycles, which have the greatest affect on soil surface temperature, *diurnal* and *annual*. We are all very familiar with both of these cycles although many of us have not been formally introduced.

The *diurnal* cycle or period consists of the daytime warming and nighttime cooling of the soil throughout the year. This warming and cooling of the soil is stimulated by variations in radiation from the sun. The sun comes up during the day and it warms up. The sun goes down at night and it cools down.

The *annual* cycle or period is the result of seasonal changes in temperature due to seasonal variations in the sun's radiation. Basically, in our area there is an increase in radiation from the sun, which starts after December 22nd, "winter solstice". This is the shortest day of the year. This is the day with the least amount of daylight for the entire year). After winter solstice, the sun's radiation increases and soon begins to provide enough energy to start to warm the soil surface. Although these increases start in December, the affects are not really noticeable until mid to late February. This is the time of year when daytime temperatures typically rise above freezing and nighttime temperatures fall below freezing. Turf blankets should be installed by this period in time to achieve the greatest benefit both in the root development and lateral growth of the turf. This warming trend continues for the next six months or so until the sun's radiation begins to decrease. The reverse then holds for the half-year summer to winter solstice. What does all this have to do with the use of turf blankets?

The function of a turf blanket is to allow for the increase in soil temperature due to the increase in the suns radiation. This is accomplished while minimizing temperature losses caused by lower nighttime temperatures. In effect you are maximizing the positive temperature gains provided by the *annual* or yearly cycle and minimizing the temperature losses caused by the *diurnal* or daily cycle. The soil temperature increases and maintains relative warmth. This principle allows for earlier warming of the soil and therefore earlier turf growth response. Based on results I have witnessed, you can gain two to three weeks of early turf development by using turf blankets in this manner.

I have a few warnings or considerations when utilizing turf blankets for early spring turf stimulation:

1. When covering the turf in this manner you increase the risk of snow mold similar to the increased risk involved with prolonged snow cover. Turf maintained at a higher level of fertility such as that receiving late season fertilization is more susceptible to snow mold. A preventive fungicide application may be warranted. Previous problems with snow mold should be considered when making this decision. If you have never had snow mold, a preventive fungicide application may not be justified. Blankets should be removed periodically to inspect for snow mold.

2. Caution should be exercised when removing turf blankets in the spring. Blankets should be removed during the day to accomplish mowing and replaced at night until the threat of frost is passed, in an attempt to acclimate the turf to normal seasonal temperatures and minimize turf damage. Late frost on sensitive turf can burn the leaf tissue and counter act early gains in turf development. Although a minor setback, turf generally recovers from frost burn with little or no long lasting ill affects.

3. Be prepared to initiate your mowing program earlier than usual and as always follow the 1/3 rule, never to remove more than 1/3 the leaf at any one time.

4. Last but not least, turf blankets are nothing more than a tool. When used in conjunction with an effective turf management program, turf blankets can enhance benefits realized from that program. That program should include but not be limited to:

a. Periodic soil testing

b. Effective nutrient management thru a site specific fertility program based on soil test results

c. Aeration a minimum of two to three times a year

d. Proper mowing management

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Soil Sampling
a critical step in the soil testing process

***by Clare Liptak, RCE Soil Testing Lab**

Soil testing is an investment yielding information worth much more than the initial cost and time required to collect a representative sample. The testing can be a routine process of agronomic management or part of an effort to resolve observed problems with field performance. In either case, the collection of a proper sample is a crucial step in the soil testing process. Improper sampling, not the analytical procedures of a laboratory or the calibration of turfgrass field equipment, may be the greatest source of error in nutrient management.

It's important to collect samples according to the recommendations of the laboratory that will be doing the analysis. The Rutgers Soil Testing Laboratory recommends that all samples submitted for nutrient testing should be composite samples, meaning that they are produced by gathering and mixing smaller soil subsamples from different areas that have important characteristics in common. This is the only way to average areas where the spreader distributing the fertilizer may have applied too much or too little. Composite sampling also minimizes other subtle but significant differences in soil produced by grading when the field was built or irregularities in irrigation patterns.

When the soil is dry enough to be crumbly in your hand, collect the subsamples from random locations of the test area using a trowel, spade or soil probe. Each subsample will be a thin slice of soil taken from below the thatch layer to a depth of six or seven inches. Each subsample, free of blades of grass and bits of thatch, should be placed in a clean, plastic bucket. Ten to fifteen subsamples from the area, broken up and mixed together, will provide plenty of soil from which to collect 2 cups for sending to the lab for testing.

Sometimes clients have difficulty deciding if one composite soil sample is sufficient for a given field. Usually an entire field may be represented by one composite sample if the type of turf and the history of lime and fertilizer applications are the same throughout the field. But there are other important differences to consider as well. If a field has a section where the soil is a different color, or texture, or if that area drains differently, that also is a reason to test the area separately. Finally, another reason to test an area separately is to determine what soil characteristics, (including drainage capability, cation exchange capacity, organic matter content, and relative amounts of sand, silt and clay, as well as nutrient levels) might account for problems that repeatedly occur in one area while the greater portion of a field is free of these problems.

Testing every two or three years is usually frequent enough to keep the pH and nutrient levels of an athletic field within the optimum ranges. A significant departure from the optimum ranges can account for loss of color, vigor, and density in a stand of turfgrass.

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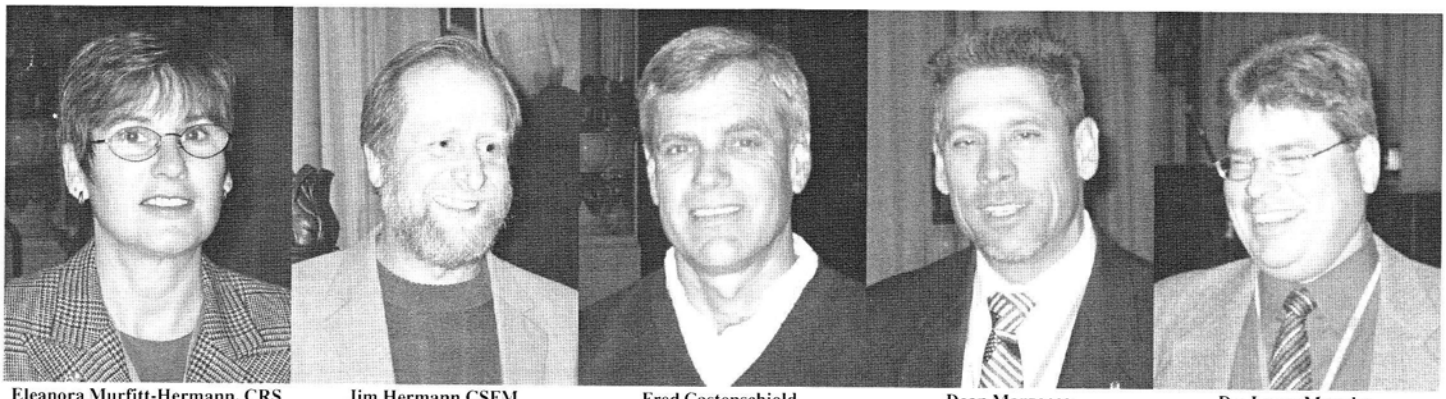

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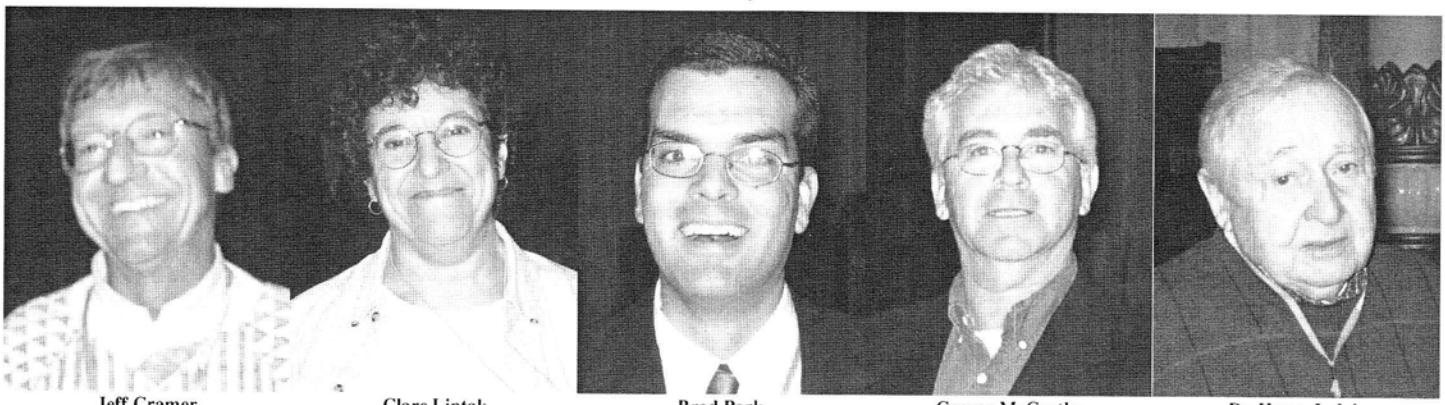

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Also, improper pH or nutrient levels can make a turfgrass stand more susceptible to attack by fungus diseases such as brown patch, leaf spot or dollar spot.

However, many other factors affect turf appearance and growth besides nutrient levels. Salt accumulation, insects and diseases, poor drainage, compaction, shallow rooting depth, drought and weed competition all have significant impacts on field performance. For example, poorly drained or compacted soils contain little oxygen, which reduces potassium uptake even when the level of the nutrient is sufficient in the soil. Drainage or compaction problems will not be evident in the samples sent to the lab but should be considered as possible sources of problems when observed in the field.

Many people ask why the Rutgers Soil Testing Laboratory doesn't routinely test for nitrogen. Nitrogen exists in the soil in different, rapidly interchangeable chemical states, and the nitrate form is easily leached from soil. These facts limit the value of nitrogen analysis because the levels of various forms of nitrogen in the field may have changed by the time the results are available.

Turf managers should keep the plant disease triangle in mind. One corner of the triangle represents the disease organism, which is always present. Turf managers can not do anything about that. Another corner of the triangle is the environment. While the turf manager can not affect the weather, he or she can certainly affect the soil environment, especially when new fields are being built. Managers can adversely affect the soil environment through improper turf maintenance practices. The remaining corner of the disease triangle is the host plant. Soil testing is an inexpensive and relatively simple way to maintain the health, color and density of the host plant - in this case, the appropriate turfgrass for a particular field. This is the corner of the disease triangle in which athletic field managers can have immediate and significant impact.

For more information on soil sampling and soil testing see the RCE – Soil Testing website www.rce.rutgers.edu/soiltestinglab/

*Clare Liptak serves on the Board of Directors for Sports Field Managers Association of NJ and works for Rutgers soil testing lab. ◆

Murphy's Law

Dr. James Murphy is an Associate Extension Specialist in Turfgrass Management for Rutgers University, department of Plant Science. Ask Dr. Murphy questions concerning agronomics.
E-mail him at hq@sfmanj.org

Question: Can "frost seeding" work to rejuvenate a worn sports turf?

Answer: Frost seeding refers to the practice of scattering seed on the surface of soil during late season (late fall and winter) and relying on freezing and thawing to incorporate the seed.

Placement of seed is one important principle of both overseeding and seeding. Frost action is often suggested as a means to incorporate (place) seed into the soil. Unfortunately, "frost seeding" is very unreliable and will most often result in very poor establishment or re-establishment of turf. The reasons are due to the seed laying exposed and unprotected at the surface of the soil for an extended period of time. The exposed seed washes into low spots with rain, blows off the bare soil with the wind, and can be eaten by birds. Moreover, the freezing and thawing that "opens" the soil surface does not provide sufficiently deep voids for the seed to be adequately incorporated into the soil. All of these contribute to poor distribution and placement of seed. Thus, uneven emergence of seedlings is typically the best one can expect from a late season seeding that is not placed into the soil.

Thus, those that must perform late season overseeding and seeding should do so with techniques that place the seed into the soil. Seed to soil contact is essential for success; without it you will have disappointing results. Slice-seeders and aerifiers are essential tools that a turf manager needs for successful placement of seed regardless of the time of season. ◆

Getting Equipment Ready to Go

by Gilbert Pena, Marketing Manager, Commercial Mowing, John Deere Turf Care & Steve and Suz Trusty, Trusty & Associates

While many of us will put our mowing equipment to bed for the winter, others will continue in the snow removal season. As you finish storing mowing equipment, go ahead and get snow removal equipment ready to go for that first surprise storm.

· A pre-season service for two-cycle machines should start with fresh fuel and oil. To prevent the engine from running hot, make sure to have a proper fuel/oil ratio mix. For models that do not require a fuel/oil mixture, add fresh fuel. Each model's operator's manual will have the exact measurements.

· Check the belts on the drive mechanism to ensure that they still move freely and haven't hardened. If the belts have hardened, they're more likely to break during a job, leaving your customer with downtime.

· Do not forget to lubricate, adjust and inspect all moving parts and safety devices before the first use of the season. Safety shields and guards should be in good shape and fastened in place.

· To minimize chute clogging, try spraying slip-plate lubricant onto the surface of the chute.

· For walk-behind snow removal equipment, make sure that the operator presence system is engaged.

· Do not forget about safety. Take the opportunity to remind all operators of important safety precautions. Shop safety posters, for example, are an ideal way to inform your employees and customers about safe operating habits. Those practices include blowing snow away from people, parked cars and buildings; never putting hands in the discharge chute to unclog snow or debris and wearing protective eyewear and clothing. Again, since all models have specific safety features, refer to your operator's manuals for important seasonal safety tips.

Tackling the Equipment

Once the turf preparations for winter have been completed, it's time to concentrate on preparing the equipment. At the end of the mowing season, one of the worst things you can do to a mower of handheld product is to simply "put it up" until the next season. Proper store affects its useful life and reliability.

First and foremost, prepare the fuel system for storage. If left over long periods of time, fuel can deteriorate and turn into a gel or paste-like- substance that will clog the fuel lines and varnish the carburetor. You can either run the fuel completely out of the engine, or rotate the fuel shutoff value and run until the engine dies to empty the carburetor so it does not gum up. If you