DO YOUR ATHLETIC FIELDS NEED TURF BLANKETS?

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 that 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 the 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 effects 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 sun's 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 and considerations when utilizing turf blankets for early spring turf stimulation:

1. Turf blankets may be applied anytime from November to March. I aerate, seed, fertilize, sometimes topdress and apply fungicide before putting down the blankets. To insure that the stakes hold, use 8.—inch nails with washers. You will have to go around once a month and pound them down as the ground heaves. Starting in February (once the snow is gone), check under your blankets at least once a week. Note that the turf will not be strong enough to play on for at least a week after removing the blankets but it is well worth waiting for.
2. 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.
3. 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.
4. 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.
5. Not every turf blanket is made the same. Do your homework. Some can be cut to your specifications. Some have grommets for your nails while others sew their edges. They are made of different material. Check the warranties. Some do work better than others.
6. 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 through 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

Reference

Marshall, T.J., J.W. Holmes, and C.W. Rose. 1999. Soil Physics. Cambridge University Press, Cambridge, MA.

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DID YOU KNOW?

The turf course at Monmouth Park Racetrack has four movable rail positions (inside rail, 12.0-ft., 24.0-ft., and 36.0-ft.,) to manage turfgrass damage caused by thoroughbred racing.

SHEA STADIUM: DID YOU KNOW?

Shea Stadium is located at 123-01 Roosevelt Avenue, Flushing, NY and can be reached by the No. 7 NYC Subway train.

APPLYING GYPSUM - When Is It Really Needed?

Dr. David D. Minner*

Gypsum ($CaSO_4$) is often applied but seldom needed on Iowa [*or New Jersey*] sports fields. The classic misunderstanding with gypsum arises from its association with improving water movement and soil structure on sodic (high sodium) soils that are not typically found in Iowa [*or New Jersey*].

Gypsum is correctly used on sodic soils that have undergone a process of deflocculation. In this case, gypsum will likely improve soil structure and water infiltration. A brief review of soil cation exchange capacity (CEC) and soil aggregation may help you understand how this is actually accomplished by gypsum. There are many negatively (-) charged sites on the surface of clay particles. Some of the more important nutrients are positively charged (calcium Ca^{++}, magnesium Mg^{++}, iron Fe^{++} and potassium K^{+}) and attach themselves to the negatively charged soil particles. These positively charged nutrients are called cations. The CEC is simply a measure of how many negative sites are available to attract the positively charged nutrients or cations.

Soil aggregation is another term you will need to understand to follow this discussion. Small individual soil particles are clumped together to form aggregates or "soil crumbs." Calcium - gypsum is a source of calcium - can cause this granulation to initiate in a process called flocculation, however flocculation alone does not make aggregates stable. Organic matter and other viscous microbial products stabilize soil aggregates. In a well aggregated soil there are larger voids between the "soil crumbs." The larger voids or macropores improve water infiltration.

Now, back to gypsum. The CEC sites in sodic soils are dominated by Na. Other cations that help soil aggregation, such as Ca^{++} and Mg^{++}, are displaced by Na^{+}. The excessive sodium reverses the process of aggregation and causes the "soil crumbs" to disperse into individual soil particles. The deflocculation that occurs in sodic soils results in a very tight arrangement of individually dispersed soil particles saturated with Na^{+}. Macroporosity is greatly reduced and water infiltration slows to near zero. When wet, sodic soils are slick, sticky, and have poor drainage. When dry they become quite hard. Gypsum is correctly used to remedy this situation caused by excessive sodium in the soil. The Ca^{++} in gypsum ($CaSO_4$) displaces Na^{+} on the exchange site. The Na^{++} reacts with sulfate (SO_4^{-}) to form sodium sulfate (Na_2SO_4); a highly water soluble material that is leached from the soil. Removing Na^{+} and replacing Ca^{++} on the exchange site reduces deflocculation and allows natural aggregation of particles that eventually restores soil structure. Gypsum is very useful when soil structure deteriorates because of high Na^{+}.

The **misconception** arises when there is a belief that gypsum can improve structure and drainage in any heavy clay soil, even those not necessarily affected by Na^{+}. A Na^{+} impact on soil structure that requires the application of gypsum only occurs on a small percentage of sports field soils. A soil test will determine the need for gypsum application. The problematic symptoms of sodic soils are very similar to those of heavily trafficked clay soils that are not affected by Na^{+}; both are hard and have poor structure and drainage. To add confusion, gypsum is often advertised as a "soil softener" material. Most soil scientists agree that gypsum will not be useful for improving poor permeability due to problems of soil texture, compaction, hardpans, claypans, or high water tables. Most sports field managers should not anticipate a reduction in compaction and improved drainage by using gypsum. Even with this misconception, there are situations where gypsum is useful in sports fields.

Gypsum ($CaSO_4$) can be used to supply Ca. When pH is above 6.7 and Ca is deficient, gypsum instead of lime ($CaCO_3$), should be used to supply Ca. Lime applied to an already high pH would further increase pH and may lead to iron deficiency. Gypsum supplies Ca without increasing pH. A suggested target range for Ca in the plant is 0.4 to 1.2%. Many water supplies are often high in Na^{+}. Sand based systems irrigated with high Na^{+} water may have excessive Na^{+} on the exchange complex. Since sands do not deflocculate, the high Na^{+} in this case will not result in reduced drainage. Sands retain their macroporosity through particle size arrangement rather than by aggregation of particles. The high Na^{+} irrigation water can easily displace Ca^{++} and make it deficient in sandy soils with low CEC. Gypsum can be used in this case as a source of Ca^{++}. Testing both soil and plants associated with sand based sports turf has revealed that apparently adequate levels of Ca^{++} in the rootzone have produced apparently deficient levels of Ca^{++} in the plant. Application of gypsum in these situations increased plant calcium and improved turf growth (Dr. David York, personal communication 1998). Calcium availability, uptake, and effect on turfgrass performance in athletic fields continues to be evaluated.

Sodium Chloride (NaCl) is commonly used as a deicer for roadways and sidewalks. Soil Na levels may be elevated in grass areas adjacent to paved surfaces treated with NaCl for deicing. Gypsum may be helpful to remove excessive Na from the soil is this situation.

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LOOKING FOR SUCCESS?
Look no further than. . .YOUR STAFF!

STMA Editorial Staff*

Your staff has a significant impact on your success. The work that they do is a direct reflection on you, your ability to train, to motivate and to lead. Reaching the goals of your facility is only possible through good management of your people and their continued development. To make sure you are fully embracing the talents of your staff, use these simple techniques.

Top 10 Strategies to Engage Your Staff

1. **Seek input and listen.** Your staff is a great resource for ideas and improvements. Asking for their opinions and solutions to problems, truly listening to them, and implementing as appropriate, strengthens their commitment to you and to their job. Involving your staff in decision making builds loyalty and improves retention.

2. **Set expectations.** Clearly and consistently set expectations for each employee through jointly written performance objectives. Good performance can't happen if they do not understand what you expect. Reinforce your expectations verbally.

3. **Provide continuous feedback.** Praise accomplishments, large and small, and for those projects that weren't as successful, use them as learning experiences to find out what could have been done differently. Don't wait until the end of the year at performance time to express dissatisfaction.

4. **Show appreciation.** Just say "thank you!" When you reward and acknowledge good behaviors, you get more of the same. Publicly acknowledge your staff for doing a good job, and look for other ways to reward their efforts. According to a Harris Poll, the top three satisfaction drivers for employees are control over their work; the opportunity to use their talents and skills; and recognition and appreciation.

5. **Be accessible.** By being visible and available, you send the message that you are part of the team and are ready to support their efforts to get the job done.

6. **Train, Train, Train.** Training in the correct procedures and equipment use is critical to getting the job done right, but also for health and safety reasons. The continuous upgrading of skills also provides employees with the means for promotion. Consider training opportunities in areas outside of their core responsibilities, such as in writing skills, public speaking, customer service, business management, etc. You and your facility will reap many benefits from improving their "softer" skills.

7. **Empower your staff.** Give them as much information as possible about what and why, and allow them to make decisions appropriate to their work.

8. **Provide a safe and comfortable working environment.** Don't expect employees to use outdated or faulty equipment. With anxieties at an all time high regarding increased terrorist activity, make sure you have emergency procedures in place to protect the workforce in the event of an attack, and ensure that every employee is aware of these procedures.

9. **Treat with respect.** Respect and accept each person as an important member of the team.

10. **Inspire your staff.** Be a coach and a cheerleader. Be sure your boss knows about the good work they do. When you help them succeed, you succeed.

**This article is compliments of Sports Turf Managers Association (STMA), Lawrence, KS.*

DID YOU KNOW?

The term *field capacity* refers to the amount of moisture remaining in the soil after gravitational moisture has drained.

Calendar of Events

NJ Turf & Landscape Conference and Expo 2006
December 5-7, 2006
Trump Taj Mahal Casino-Resort
Atlantic City, NJ
(215) 757-6582
Expo 2006 will feature online registration at:
www.njturfgrass.org

18th Annual Sports Turf Managers Association Conference and Exhibition
January 17-20, 2007
Henry B. Gonzales Convention Center
San Antonio, TX
1-800-323-3875
Online registration at: **www.sportsturfmanager.org**

Three-Day Athletic Field Construction and Maintenance
February 27-March 1, 2007
Rutgers University -
Office of Continuing Professional Education
Cook College, New Brunswick, NJ
732-932-9271
www.cookce.rutgers.edu

Understanding Synthetic Fields
March 7, 2007
Rutgers University -
Office of Continuing Professional Education
Cook College, New Brunswick, NJ
732-932-9271
www.cookce.rutgers.edu

Baseball/Softball Infield Skin Construction and Management
March 14, 2007
Rutgers University -
Office of Continuing Professional Education
Rutgers Snyder Research & Extension Farm,
Pittstown, NJ
732-932-9271
www.cookce.rutgers.edu

YEAR IN REVIEW 2006

Dr. John Grande, Director, Rutgers Snyder Research and Extension Farm, Pittstown, NJ describes methods used to calibrate rotary and drop spreaders used to apply granular fertilizers and pesticides at the SFMANJ Summer Field Day held at the County College of Morris, Randolph, NJ on June 28, 2006.

Field Day attendees were given the opportunity to build a pitchers' mound as part of the SFMANJ Spring Field Day 2006 held at Shore Regional High School, West Long Branch, NJ on April 13, 2006.

Big roll sod is lined-up to be installed on a racing chute at Monmouth Park, Oceanport, NJ. The turf course at Monmouth Park racetrack was the site of the afternoon sessions of the Spring Field Day, April 13, 2006.

Brad Park demonstrates the use of the Clegg Impact Soil Tester to Don Savard, CSFM, CGM, and other attendees at the SFMANJ District I meeting held at Harrington Park, Long Valley, NJ on May 4, 2006.