FOOTBALL MAINTENANCE FOR COOL-SEASON HIGH SCHOOL FIELDS

SPORTSFIELD AND FACILITIES MANAGEMENT

# SportsTurf

June 2014

## Leading EDGE:

### BASIC ELEMENTS KEY to Isotopes' FOY

ALSO INSIDE:

### BEATING SUMMER STRESS

### FROM SEED TO PLAYING IN 35 DAYS

### LIMITING LIABILITY FOR YOUR SPORTS FACILITY

green media

SportsTurf MANAGERS ASSOCIATION

OFFICIAL PUBLICATION OF THE SPORTS TURF MANAGERS ASSOCIATION

# We fix relationships.

Are water repellency issues driving a waxy wedge into your soil/water relationships? Probably. Statistically speaking, there comes a time in every soil's life when water just doesn't find it as attractive anymore...

Aquatrols soil surfactants help re-establish the bond between soil and water, making water-repellent areas attractive and receptive to water once again. And with a full line of formulations, we can help you solve a wide range of relationship issues.

**Aquatrols. We bring back the ❤.**

**Watch the video!**

scan the QR code with your smartphone
or visit YouTube.com/Aquatrols

Aquatrols®
www.aquatrols.com

# SportsTurf

## Subscribe today to choose the version that fits your Lifestyle

- Available one week prior to the print version
- **BONUS:** Expanded content
- Page for page replica of the print version
- Read content instantly – no downloading required
- Hot links to advertisers websites
- Save a Tree – every page you read online is one that didn't go through the paper mill.

Digital issue not for you?
**You can subscribe to either version**
– simply click on the link below
to claim your **FREE 1-year subscription**


• iPad • Mobile • Print

**www.sportsturfonline.com/subscribest**

# Contents

June 2014 | Volume 30 | Number 6

## FEATURES



## DEPARTMENTS




**On the cover:**
Casey Griffin, director of field operations for the MiLB Albuquerque Isotopes, works the base paths in preparation for another season in New Mexico. Griffin says overseeing a $250,000 renovation project within his first month as director was "an extremely intense and rewarding opportunity."

# Membership Application

SportsTurf MANAGERS ASSOCIATION

Experts on the Field, Partners in the Game.

*Fax to: (785) 843-2977*

*Or mail with payment to:*
*Sports Turf*
*Managers Association*
*P.O. Box 414029*
*Kansas City, MO 64141*

Name _____ Title _____

Employer/ Facility _____

❑ Business ❑ Home

Address _____

City _____ State _____ Zip _____

Home phone _____ Work _____ Cell _____

Fax _____ Email _____

Signature _____

Direct Supervisor Name _____

## New Members*

*As a new members, you receive a FREE conference registration, value $375, to be used within 3 years! Just indicate your status on the conference registration form.*

*Did someone refer you to STMA? We would like to thank them, and reward them with an STMA $100 voucher.*

Person who referred you:

_____

Facility name:

_____

*Not been an STMA national member since 2000. New student and affiliate memberships do not qualify for the free conference registration. However, all members are eligible to receive the $100 voucher for referring a new qulaifying member.

## Membership Category:

| | |
|---|---|
| ❑ Sports Turf Manager | $110 |
| ❑ Sports Turf Manager Associate* (Additional member(s) from the same facility) | $75 |
| Please select the primary facility type where you are employed: | |
| ❍ Professional Sports ❍ Higher Education ❍ Schools K-12 ❍ Parks and Recreation | |
| ❑ Academic | $95 |
| ❑ Student (verification of enrollment) | $25 |
| ❑ Commercial | $295 |
| ❑ Commercial Associate* (Additional member(s) from the same commercial company) | $75 |
| ❑ Affiliate (Person who is indirectly or on a part-time basis, involved in the maintenance/management of sports fields) | $50 |
| ❑ Retired | $50 |
| ❑ Chapter Dues (contact headquarters for amount) Chapter name) _____ | $_____ |
| ❑ Contribution To SAFE Foundation (research, education and scholarship): | $_____ |
| **Total Amount Enclosed:** | $_____ |

## Payment Method:

❑ Check ❑ Money Order ❑ Purchase Order #:_____

Credit Card: ❑ Mastercard ❑ Visa ❑ American Express ❑ Discover

Name on Card _____

Card #: _____ Exp. Date: _____

Signature: _____

*There must already be a national sports turf member from your facility or commercial member from your company before you may sign up in the Associate category.

**Phone: 800-323-3875** **www.STMA.org**

## From the Sidelines

**Eric Schroder**
**Editorial Director**
eschroder@specialtyim.com
717-805-4197

# Compost and your fields

**I thought it might be a good idea to** share some information on using compost on sports turf as a rootzone mix or topdressing; this topic may become more important to you if the trend of banning pesticides continues to grow (pun intended).

According to the abstract of a paper titled "Organic Land Care Practices in Maintaining Sustainability of Athletic Field Turf," presented at last fall's big agronomist conclave in Tampa by William M. Dest, University of Connecticut, and Jeffrey S. Ebdon, University of Massachusetts, there is increased interest in organic land care practices in lieu of using conventional practices that use pesticides and standard fertilizer compounds. "However, as the conversion from conventional practices to organic methods takes place, there is no science-based information related to its use on turf sustainability and field safety," say the authors.

To remedy that, they conducted research beginning in 2010 examining the long-term effect on turfgrass sustainability, playing quality characteristics and soil quality using an organic land care system compared to a conventional maintenance system using Integrated Pest Management. Re reported results through 2012, the authors say the only difference in turf quality between the organic and conventional treatments was in 2011 at a 2.52 inch mowing height "because of the ingress of crabgrass into the organic plots thus providing a significantly lower rating than the conventional treatment that received a post application of herbicide to control the crabgrass." They reported that wear injury was significantly greater at this mowing height during the Fall of 2011 and 2012 compared to the 1.25 inch height because of continuing crabgrass competition which was absent on the 1.25 inch mowing height plots.

"This also affected slower spring recovery at the higher mowing height," they wrote. "There was no difference in root biomass between the organic and conventional management systems taken from samples in 2012. Infiltration rates were not significantly different between the two systems in 2011 and 2012."

Here's how to get started on compost applications, courtesy of a Sports Turf Managers Association Bulletin:

Consult schools, campuses, or your own facility to obtain raw materials for composting. Common raw materials used include:

- Coffee grounds
- Animal manure – poultry, horse, cattle
- Leaves
- Grass clippings and yard waste (Try to avoid using plant waste treated with herbicides, as this could be problematic in finished compost. Always read the pesticide label to see if clippings from treated turf can be used for compost.)
- Wood chips and sawdust
- Clean paper, cardboard, and shredded newspaper
- Food waste from dining facilities excluding dairy products, fats, grease, lard or oils, meat or fish bones and scraps

These materials can be combined into piles, rows or vessels at appropriate proportions to reach a 30:1 (or less) carbon to nitrogen ratio. Organic materials that contain nitrogen include grass clippings, food waste, coffee grounds and manure. Organic materials that contain carbon include dry leaves and woody materials. The pile should be kept out of direct sunlight and moisture content should be carefully monitored so the pile does not become too wet or dry.

To reach a finished product, mature compost requires proper aeration, consistent particle size, sufficient moisture, and high temperatures. The time frame for proper decomposition varies depending on if all of these factors are met and also the method used (piles versus in-vessel). Some sports fields will have multiple piles in various stages of decomposition so compost is available when needed. ■

SportsTurf
SPORTS FIELD AND FACILITIES MANAGEMENT

**EPG Media/Specialty Information Media**
**3300 Fernbrook Lane N,**
**Suite 200, Plymouth, MN 55447**

**The Official Publication Of The Sports Turf Managers Association**



SportsTurf (ISSN 1061-687X) (USPS 000-292) (Reg. U.S. Pat. & T.M. Off.) is published monthly by Specialty Information Media at 75 Pike Street, Port Jervis, NY 12271. POSTMASTER: Send address changes to Sportsturf, PO Box 2123, Skokie, IL 60076-7823. For subscription information and requests, call Subscription Services at (847) 763-9565. Subscription rates: 1 year, $40 US & Poss.; 2 years, $65 US & Poss.; 1 year, $65 Canada/Foreign Surface, 1 year, $130 Airmail. All subscriptions are payable in advance in US funds. Send payments to Sportsturf, PO Box 2123, Skokie, IL 60076-7823. Phone: (847) 763-9565. Fax: (847) 763-9569. Single copies or back issues, $8 each US/Canada; $12 Foreign. Periodicals postage paid at Port Jervis, NY and additional mailing offices. 

**Direct Mail List Sales**
MeritDirect, Jim Scova
Phone: (914) 368-1012
jscova@MeritDirect.com

**Subscription Services**
Phone: (847) 763-9565
Fax: (847) 763-9569

**Reprints**
Robin Cooper
rcooper@specialtyim.com

**Group Publisher**
Jeff Patterson
Phone: (763) 383-4458
jpatterson@epgmediallc.com

**Account Representatives:**
Chris Pelikan
Senior Account Manager - East
Phone: (954) 964-8676
cpelikan@epgmediallc.com

**Peggy Tupper**
Senior Account Manager - Mid-West
Phone: (763) 383-4429
ptupper@epgmediallc.com

**Leslie Palmer**
Senior Account Manager - West
Phone: (248) 731-7596
lpalmer@specialtyim.com



# President's Message

**David J. Pinsonneault, CSFM, CPRP**
dpinson@lexingtonma.gov

## Value! Value! Value!

**Have you purchased bath soap** lately and noticed the smaller size of the bars while also noticing the price continues to increase? Have you received a dollar-off coupon where you only get to use it if you buy more than one? In this day and age of receiving less for more, it is reassuring to know that your STMA membership provides you with more value for your dues dollars. You have more than 25 committees and subcommittees plus a task group working to find ways to enhance your membership. From certification…to the conference…to educational bulletins…to awards…to public relations, you have these and many more resources to help you succeed. People and organizations place different values on different things. It is the hope of your Board of Directors that STMA offers a membership that you find value in and that you use.

There are also resources that enhance your value as a professional and your value to your organization. Members are receiving their 5- and 10-year recognition pins. This shows commitment to the profession and dedication to providing well-maintained and safe facilities. By staying a part of STMA, members help us improve our value so we can continue being the "go-to" resource for you.

Another value-added recognition program is "Field of the Year". This is an opportunity for you and your facility to gain recognition for the outstanding work you do. A few years ago STMA recognized that there were other sports (lawn tennis, rugby, polo, horse racing) that needed a category of awards, and it was added to bring value to your membership. The application is available at STMA.org, so take advantage of this great program. We have also made some positive changes to the Innovative Awards so that both commercial members and general practitioners benefit.

Another value of membership is the opportunity to benefit from, and interact with, the SAFE Foundation. Your support of SAFE leads to better awareness about field safety. SAFE produces resources like the Mound Building/Home Plate Maintenance and Infield Management videos. SAFE is creating many more educational videos. Please check out its new website, SafeFields.org, and see the value SAFE adds to your membership.

The last value I will mention is the ability to pick up the phone or send an email to any sports turf manager or commercial member to discuss issues you may be having at your facility. What a benefit it is to know that I can call Troy with the Arizona Cardinals, Abby with Wake Forest University, Jody with the Blue Valley School District, Sarah with the city of Phoenix, or Lynda with Hunter Industries and receive help to do my job better. STMA members are known for giving back to the profession. Our ability to network with members across the country and across disciplines is an invaluable benefit of membership.

While someday our prices may increase, it is with the hope that we will continue to add value, continue to be a bargain and to make STMA the organization that you cannot do without. ■


# FOOTBALL MAINTENANCE FOR COOL-SEASON HIGH SCHOOL FIELDS

**For as long as I can remember, I have spent** most of my winters going to continuing education classes. I can recall many great talks about baseball field maintenance for all different levels of competition. There are many sources of information about the craft of maintaining baseball fields. However, when it comes to the sport of football, I don't recall many talks or articles about maintaining a high school field or any other type of football field.

» Our maintenance program doesn't begin and end with the football season but rather focuses on a yearlong approach. **The new season begins as the old one ends.**

I hope maintaining a cool-season natural grass football field is not becoming a dying art. It is an art, you know. Taking a beautiful turf canvas in pleasant September weather and keeping it safe and playable as the temperatures drop through Thanksgiving takes an artist's touch. A couple of years ago I spent some time talking with Tony Leonard of the Philadelphia Eagles about this subject on our way back from the STMA Conference in Daytona. Even at the highest level of completion, Tony is often asked "Why can't you grow grass on that field"?

During our discussion, I found out that there are many reasons why it is difficult. Sharing the stadium with Temple University, dealing with shade issues, hosting many non-football related events and maintaining turf in a very narrow set of hash marks are just a few of the

hurdles that Tony and his crew face . In addition, the pro game is played by the largest athletes in all of sport. The fact that they play the bulk of the game in a small area of the field causes a variety of maintenance problems. Tony has adjusted by changing his field over to bermuda grass during the warm weather months. This allows him to get through most of the season on a very durable surface. As the weather cools the bermuda is removed to the depth of 1.5 inches and thick cut bluegrass sod is installed to finish out the late season schedule with good turf cover. This process has been very successful for Tony and the Eagles.

While this may be a good answer on the professional level, what about those of us on the high school or park and rec level? Are there answers to the problems we deal with on our football fields or are we facing a future with plastic football fields as the solution? I don't claim to have all of the answers, but we have had a lot of success with the maintenance of our football fields at Overbrook. Our maintenance program doesn't begin and end with the football season but rather focuses on a yearlong approach. The new season begins as the old one ends.

## ENJOY AN EARLY SPRING

Spring is a very important time for football fields. The fall season really wears out most fields and springtime is usually the time that significant recovery can take place. This process can be slowed by lacrosse but recovery must be taken into consideration regardless. March 1 in New Jersey is the first day you can apply fertilizer **legally** and we do; at least .5 lbs of N per 1000 sq. ft. are applied through an application of ammonium sulfate. This provides food for the new turf planted at the end of last season and promotes growth of established turf also.

In addition to an early application of N, there must be a concentrated effort made to begin mowing to remove dormant turf and promote new growth. It is tempting to allow football fields to lie dormant in early spring. There are a lot of other things going on and football is not one of them. Don't fall in to this trap. The quicker your turf is actively growing, the quicker it has the ability to establish and endure the stress of drought and pest pressures that are coming later in the spring and summer. Fertilizer is provided on an as needed basis during the spring with the intention of not applying more than .5 lbs N per 1000 sq ft. per month.

## AERATION

Aeration is something that is very important but commonly overlooked. In our case, we have a core aerator but have no good way to clean up the messy cores. In addition to the mess, coring during the football season may not always provide the results you are looking for. Problems occur during the season if you open up a worn field by coring. Sometimes because of a busy schedule there is not enough time for the field to recover before the next game is played. This can cause a poorly rooted field to suffer damage even though that was not the intention.

At Overbrook we have found a nice window of opportunity right after Memorial Day. Early June is after our spring season and usually before the weather gets too hot. The fields seem to really respond well at this time of year. The turf is actively growing and our activities are limited. We try to make up for the few coring opportunities that are available by using our slicing aerator when we are seeing signs of compaction. This aerator provides us the ability to open things up without disturbing the playing surface. It is a very valuable tool that also aides us in our fall over seeding program by providing a nice seedbed. Another added benefit of slice aerating is the ability to find grub damage quickly during August and early September. It is much better for us to find grub damage and treat it, rather than an injury occurs due to field conditions. Ultimately, it is up to the turf manager to find the right time and aerator for your site.

## SUMMER STRESS

Summertime is a time of rest for our football turf. We are lucky that there is very little activity during the summer months until football camp opens around August 15. Our cutting height is raised to 3 inches and mowing frequency is set at 3 to 4 times weekly. The thinking is that I don't want to put any extra stress on the turf. Higher cutting heights do cause other issues though. Suppressing dollar spot with nitrogen often causes brown patch to develop when the weather conditions are right.

In an attempt to break this cycle we tried an organic-based product. It is not a pure organic product but rather a bridge product that is easy to use and can be applied at workable rates. The results last year were very interesting. We had both diseases pop up last summer but in very small amounts and with no noticeable damage. I am going to use this product again this summer to see if we can obtain similar results. Fungicides are not part of our maintenance program so we are constantly making adjustments to see if we can suppress disease without their use. With that in mind, our irrigation routine is based on need not schedule. This sounds like common sense but it gets complicated with tricky summer weather. The fields are checked daily for soil moisture and then irrigated or not based on this information. I have found that it is ok to get a little dry over the summer. Proper water management is crucial for surviving summer heat and humidity. Please don't set your timer box and forget it.

## THE SEASON BEGINS

Football season at Overbrook starts around the middle of the month but it actually begins for us around August 1. This is when the fields are laid out. Before the fields are painted we cut in a football pattern consisting of end zones cut in the same direction and every 5 yards cut in the opposite direction. This is done to burn the pattern in without having to waste paint before field use begins. The weather has been pretty unpredictable over the past couple of years. We have had wet weather that causes a lot of damage due to the repetitive nature of football practice. Our coaches do a great job of moving around but sometimes damage is inevitable.

After a wet practice we will sometimes use a light roller to push down damaged turf and broadcast perennial rye seed. This process

▲ **Carmelo Anguilla** running a mower.

is used in wet or dry conditions in order to keep up with field damage. Seed is the great equalizer in this equation. It allows us to keep some turf cover. Summer camp is different from our regular practices during the school year. Practices are longer and are held 6 days a week for around 3 weeks. In addition to seeding, managing moisture is probably the key to surviving this time of the season. During warm weather irrigation is run just after practice to help the turf recover and allow plenty of time to dry before the next practice. A wet field can be ruined in a single practice. Monitoring your field during this period is very important. Your practice field is going to be used all year long. If no maintenance is done, it will be a very long and bare season.

▲ **Bill Loftus** filling divots.

## GAME ON

It always amazes me how much more energy and time we spend on our game fields. The team spends much more time on the practice field but the game field garners all of the attention. At Overbrook we have a very good situation when it comes to our stadium field. One of the reasons the field holds up as well as it does is the fact that it really is just a football field for games. Our coaching staff has even volunteered to move their Friday practices to the practice field in order to preserve conditions on the game field. The Overbrook marching band has their own practice area at the back of our school that allows them to practice whenever they want. They do however practice on the game field for longer periods of times than I would like during the competition portion of their season. It does force us to aerate more and keep an extra eye on the area of the field that they practice on over and over again. I guess the best advice is to have a good relationship with your coaches and administrators to make your life easier.

Cooperation is great but you need a good plan going in to the week of a football game. Start by looking at the weather forecast to set up a painting and mowing schedule. Typically we will cut Monday, Wednesday and Friday for a Saturday game with painting reserved for Thursday and Friday. Our cutting height is a little higher than most fields (2.5-3 inches). We counter that by using a light roller on game day to provide a smooth flat surface. In order to keep our sidelines straight, they are cut a quarter inch shorter that morning before rolling. As the season progresses we begin to broadcast perennial rye seed before our games. This allows the athletes to work the seed in with their cleats.

This year we have purchased a Woods seeder that we will use to renovate the center of the field throughout the season. The combination of all of these things is what allows us to provide the best surface possible on a tight budget. Post-game repairs and rest are what really holds the field together from week to week. In the beginning of the season when it is hot, we will irrigate the field as soon as everyone is off after a game. This helps the recuperation process begin. We may also lightly roll the field to push down any loose turf. This allows that turf to re-root if given enough moisture. In addition, we also remove all loose divots that are not still attached. The divots then are filled with a pre-made divot mix consisting of mushroom compost soil and seed. Sometimes this doesn't happen until Monday depending on manpower and time of the game. However, it is better to get as much repair work done as soon as possible to give the field maximum recovery time.

## BEDTIME

As one season ends another begins. After our last home game of the year, we get ready for the following year. Seeding throughout the season definitely helps this process. Our goal at the end of the year is to fully repair the entire field and have as little bare soil as possible exposed. We start by topdressing all divots and low spots and then seed the entire field with tall fescue seed. Over the past few seasons we have been trying to incorporate more turf type tall fescue varieties in to all of our fields because they seem to do a better job resisting disease damage in the summer than perennial rye. The rye serves its purpose during the season by being durable and germinating under difficult circumstances but the addition of the tall fescue gives us more cover going into the season. After the field is topdressed and seeded, we roll one more time and put the final application of ammonium sulfate out. I recommend that you do whatever it takes to keep any type of play off of your field at this time because it is almost at the point of dormancy and any wear will be difficult to repair. A couple of pick-up games can cause a lot of unnecessary damage that will need to be repaired in the spring.

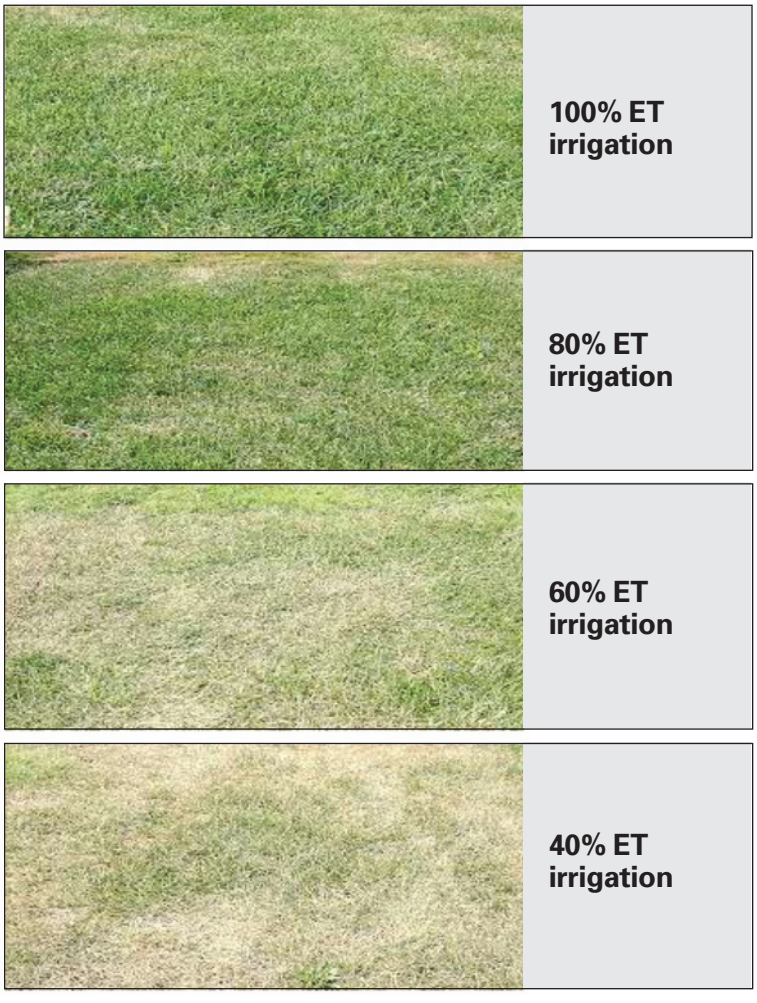
Football in New Jersey is a long season. It starts with heat and humidity and finishes with a mix of cold unpredictable weather. The best way to survive is to have a plan that you can communicate to coaches and administrators in order to provide the best possible playing surface for the athletes to use and enjoy. ■

*Rich Watson is Grounds Supervisor for the Pine Hill (NJ) School District. He won an STMA Founders Award last January when he was named recipient of the 2013 Dick Ericson Award for his contributions to the industry.*

# BEATING SUMMER STRESS FOR COOL-SEASON SPORTS TURF

**Cool-season turfgrasses, such as Kentucky** bluegrass and perennial ryegrass are widely used species on sports fields in cool climatic regions. Managing cool-season grasses in sports fields that demand for high quality or playable turf can be challenging during summer months, primarily due to heat stress. The optimal temperatures are ranged from 65 to 75° F for shoot growth and 55° F and 65° F, but temperature often exceeds the upper levels of the optimal temperature ranges in many areas, including temperate climatic regions. In addition, cool-season grass species require as much as 2-3 inches of water per week to maintain active growth during summer months. However, evaporation demands increase with rising temperatures and water availability for irrigation or from rainfall may decline during summer months, which all together can lead to drought stress. It is not uncommon that drought and heat stress may occur simultaneously during summer months. Summer stress combining heat and drought can cause grasses, such as Kentucky bluegrass, undergo dormancy and severe decline in turf quality and field playability.

▼ **Illustration of turf performance** of Kentucky bluegrass under different deficit irrigation regimes.




The question is how to maintain high quality turf of cool-season turfgrasses in sport fields during summer months with increasing temperature and declining water availability? This article describes characteristics of heat and drought damages in cool-season turfgrass species, and discusses some cultural practices that can be taken during spring months to prevent turfgrasses from suffering summer stress and those can be used during summer months to suppress or alleviate summer stress damages.

## CHARACTERISTICS AND SYMPTOMS OF HEAT AND DROUGHT STRESS

Root systems are essential for water and nutrient uptake, as well as production of some plant hormones regulating plant growth and development. Root growth is more sensitive to rising temperatures in the summer than shoot growth, due to its lower optimal temperature requirements. Root growth decline or root dieback, therefore, typically precede turf quality decline. Turf quality decline caused by heat stress is characterized by leaf senescence or yellowing of leaves due to loss of chlorophyll (a green pigment for light absorption in photosynthesis). Without adequate chlorophyll pigments in leaves, plants cannot properly photosynthesize for carbohydrate production. Whole-plant tolerance of turfgrasses to heat stress or turf quality is highly correlated to the amount of green leaves or chlorophyll content in leaves. When leaf yellowing as the most visible symptom of heat damages appears, root damages may have already occurred. Restricted root growth or accelerated root dieback by heat stress inhibits rooting ability for water

and nutrient uptake, and the synthesis of hormones, such as cytokinins that control leaf senescence.

Drought injury in turfgrass is characterized by leaf wilting or desiccation and reduction in cell enlargement and growth due to water deficit, although many physiological and morphological changes are induced. Under drought stress, water loss from stomatal pores on leaf surface (transpiration) increases while root growth and water uptake from the soil are limited. This results in water deficit and loss of cell turgor. Leaf wilting or rolling is a typical symptom of drought stress. Turf experience drought stress initially becomes bluish, dull green color and then turns to brown color as chlorophyll content decreases with stress progression.

Another symptom of summer stress in cool-season turfgrasses is dormancy, in which case turfgrass leaves turn brown in response to drought stress alone or in combination with heat stress, but the meristematic crowns and stem or rhizome nodes remain alive. Dormancy is a mechanism of turfgrass escape from drought stress such that dormant plants survive (without growth) for extended periods of drought stress and resume growth when soil moisture becomes available. In general, dormant turfgrasses, especially those with rhizomes (underground stems) such as Kentucky bluegrass, can survive without water for several weeks with limited damage at temperature near or below normal levels, but may survive in dormant conditions for a shorter period of time during the summer when temperature is elevated. Depending on the duration of dormancy, grasses may recovery to a certain extent or fully recovery when temperature drops to normal levels and rainfall or irrigation becomes available. Allowing turfgrasses to go dormant may lose the field playability, although it can result in significant water savings without loss of turfgrass. Kentucky bluegrass can withstand extended period of dormancy and recover, as it has extensive rhizomes that generate new roots and shoots once soil moisture is replenished. However, bunch-type turfgrasses such as perennial ryegrass, once the turf canopy becomes desiccated and thinned under non-irrigated conditions, are slow to recover to their full canopy upon rewatering.

Any cultural practices that can promote root growth or minimize root damages and that can alleviate leaf senescence or increasing photosynthesis capacity and carbohydrate accumulation during hot summer months would help to maintain healthy, green turf during hot summer. In addition, it is important to take measures to promote turfgrasses quickly recover from dormancy once temperature drops and water becomes available. Proper routine management practices, such as mowing, fertilization, irrigation, and soil cultivation, as well as selection of stress tolerance turfgrass species or cultivars are important for maintaining actively-growing turf and improving turfgrass tolerance to summer stress. In the following sections we will focus on the discussion of practicing infrequent or deficit irrigation and use of plant growth regulators (PGRs) and biostimulants to prevent or control summer stress damages in cool-season turfgrass species, as well as cultural practices to promote turfgrass recovery from summer dormancy.

## PRE-CONDITIONING TURF WITH INFREQUENT OR DEFICIT IRRIGATION

Irrigation practices performed in the spring, when maximum growth of shoots and roots occurs for cool-season turfgrasses, may well dictate how well turf will perform in the summer. Irrigation frequency and quantity can affect root growth, shoot growth and the balance of roots to shoots, as well as other physiological processes, such as carbohydrate availability, thereby affecting plant tolerance to summer stress.

Allowing surface soil drying between irrigation or infrequent irrigation typically reduces water loss due to slower vertical shoot growth and stimulates root penetration into deeper soil profiles by promoting carbon allocation

into roots and reducing carbohydrate consumption of the shoots. In contrast, frequently irrigated turfgrasses (soils that are kept wet constantly) use more water than turfgrasses that receive less frequent irrigation and also promotes shallow root systems, which limits water uptake from deeper soil profiles where water may be available. Deficit irrigation is applying water at the quantity lower than the maximum amount of water evapotranspired from the turf (often measured at ET rate) with little or no loss of aesthetic turfgrass quality or field playability. Deficit irrigation has been associated with increases in water use efficiency. The level of deficit irrigation, however, varies with turfgrass species, soil types, and climatic conditions. For example, some cultivars of Kentucky bluegrass were able to maintain acceptable turf quality with 80% ET irrigation while 60-80% ET irrigation was adequate for tall fescue during June-September in loamy soils in Manhattan, KS.

Either infrequent or deficit irrigation may induce mild water deficit, leading to pre-conditioning or enhancement of physiological hardiness of plants. Infrequent or deficit irrigation promotes deep rooting, facilitates water retention (osmotic adjustment) mechanisms, and activates antioxidant stress-defense systems. Such mechanisms have been found in various plant species, including Kentucky bluegrass. Therefore, infrequent or deficit irrigation may be practices in spring for effectively promoting summer stress tolerance of cool-season turfgrasses. Spring is the best time to pre-condition plants for combating summer stress.

## USE OF PLANT GROWTH REGULATORS AND BIOSTIMULANTS

Plant growth regulators are synthetic hormone-synthesizing inhibitors or other synthetic compounds that regulate plants growth and development at very low concentrations. Biostimulants contain various organic solutes, such as amino acids, sugars, antioxidants, and hormones, and many biostimulant products are extracts from seaweeds or kelps. Recently, PGRs and biostimulants have received increasing attention, and have been incorporated into the management programs in promoting turfgrass tolerance to stresses. However, most research information was obtained in golf turf management whereas field research on sports turf is limited in the study of using PGRs and biostimulants in stress management.

Among PGRs, trinexapac-ethyl (TE) is one of the most widely-used products as a foliar spay for suppressing vertical growth of shoots in turfgrasses, as it inhibits the synthesis of gibberellic acid that control cell elongation. Due to the growth inhibition effects, water demand of shoots is reduced; in addition, TE application has also been found to increase chlorophyll concentration and tiller density in warm-season and cool-season turfgrasses, including Kentucky bluegrass. The research information on TE regulation of root growth is inconsistent with no effects reported in perennial ryegrass and a reduction in root growth found in Kentucky bluegrass. As the consequences of growth and physiological regulation of shoot growth, TE is also effective in reducing water consumption and delaying drought stress or suppressing heat injury in various turfgrass species, including perennial ryegrass and Kentucky bluegrass. Ervin and Koski reported that application of TE (0.27 kg a.i. ha-1) three times per year at 6-week intervals reduced weekly evapotranspiration rate in Kentucky bluegrass in 5 out of a total of 34 weeks. Pre-stress conditioning of turf with TE seems to be more effective than applying TE at the onset or during drought stress. TE may be applied to turf at reduced rates more frequently before a dry period is anticipated or prior to reducing irrigation. How TE application may alleviate heat stress damages in cool-season sport turf are not well documented and the effective frequency and rates for improving turf performance during heat stress have yet to be determined. Further investigation is required before TE is adopted in the summer management program.

Biostimulant products contain a remarkable variety of ingredients. The effectiveness of those products can vary, depending on the mode of actions of the active ingredients. Seaweed-based biostimulants are most studied, which has been found to be effective for improving drought and heat tolerance in several cool-season turfgrasses, including Kentucky bluegrass. The positive effects of seaweed-based biostimulants are mainly due to the antioxidant activities of some compounds in the biostimulants that protect plant cells from oxidative damages induced by drought or heat stress. Proper dose and frequency are critical to the efficacy of the products. Multiple applications are often necessary to increase the effectiveness of the products in alleviating summer stress.

## MANAGEMENT PRACTICE TO SUSTAIN SURVIVAL AND PROMOTE RECOVERY

Extended period of dormancy in cool-season turfgrasses, particularly bunch-type perennial ryegrass without watering can cause the plants to die. Light, frequent irrigation during summer may sustain the survival and prevent death of dormant plants. Small amount of irrigation just sufficient to moist the canopy will not be able to break the dormancy, but provides enough moisture to keep the meristems of crowns alive until weather becomes cooler and more water becomes available.

It is critical for dormant turf to quickly regenerate new shoots and roots when temperatures cool down in the fall. However, limited research information is available in management practices promoting recovery from summer dormancy. Applying irrigation to soak the crown and rhizomes, as well as the root zone will help to weaken the meristematic tissues for the regeneration of new shoots and roots. Quick-released or soluble fertilizers, including phosphorus and nitrogen may be incorporated in the fall recovery program, as P provides respiratory energy for the regeneration of new tissues and N promotes growth of newly-formed tissues. In addition, some growth promoting hormones, such as gibberellic acid, may be applied for promoting recovery from summer dormancy. In our studies, we found foliar application of GA was effective in promoting shoot regrowth and turf quality recovery in creeping bentgrass following summer stress. However, gibberellic acid effects on sports turf recovery, such as Kentucky bluegrass and perennial ryegrass are yet to be determined. The doses and application frequency can vary with turfgrass species and severity of summer dormancy. ■

*Dr. Bingru Huang is Distinguished Professor and Ralph Geiger Chair Professor in Turfgrass Science, Department of Plant Biology and Pathology, Rutgers University, New Brunswick, NJ.*

# John Mascaro's Photo Quiz

John Mascaro is President of Turf-Tec International

## Can you identify this sports turf problem?

**Problem:** Snow cover on field on left and not on field on right **Turfgrass area:** Sports Complex
**Location:** Columbia, Tennessee **Grass Variety:** 419 bermudagrass base

**Answer to John Mascaro's Photo Quiz on Page 33**

Background illustration courtesy of istockphoto.com

# UNIVERSITY TURFGRASS RESEARCH UPDATE

Over the past 5 years we have periodically published reports from some leading turfgrass researchers in the US on their current studies. Here is our latest update on such research projects.

▲ **Above:** Colorant to improve color of dormant warm-season turfgrasses. **Top Right:** Response & recovery of DBG to severe drought. **Bottom Right:** Turf paint and glyphosate application timing effects on annual bluegrass control and zoysiagrass spring green-up

## KANSAS STATE UNIVERSITY

**Response and Recovery of Kentucky Bluegrass Cultivars to Severe Drought with No Irrigation**. In a 2-year study, we subjected 28 cultivars of KBG and two hybrid bluegrasses to 81 days without irrigation in the first year and 61 days without irrigation in the second year; plots also received very little precipitation during these periods. Our goals were to evaluate the performance of these KBG cultivars during the dry downs and their recuperative abilities after being rewatered. All 30 of the bluegrasses went completely dormant in the first year and mostly dormant in the second year from prolonged drought stress. Remarkably, all 30 bluegrasses recovered in both years, although the recovery was slower after the first dry down because of longer exposure to drought. There were no consistent differences in the performance of the 30 bluegrasses. Given increasing pressure to conserve water when irrigating turf, and the possibility of total bans on turf irrigation in some areas, a viable strategy may be to adjust our expectations to allow for some dormancy of KBG during hot, dry summers. (Drs. Tony Goldsby, Dale Bremer, Jack Fry, Steve Keeley).

» Frequency-based irrigation cycles ran three times weekly regardless of precipitation amounts, and SMS applied water only when soils dried to a predetermined threshold.

**Irrigation Management and N Fertilization Effects on Water Application Amounts and Nitrate Leaching in Turfgrass**. Urbanization in the US has increased the area covered with turf, causing greater concern about water amounts used for irrigation and the potential for leaching from nitrogen (N) fertilization in urban watersheds. In a 2-year study on a silt loam soil, we compared differences in water applied between traditional frequency-based irrigation and irrigation controlled by soil moisture sensors (SMS) in tall fescue turfgrass. Frequency irrigation cycles ran three times weekly regardless of precipitation amounts, and SMS applied water only when soils dried to a predetermined threshold. Within each irrigation treatment, nitrate leaching was also measured in subplot treatments consisting of N applications of urea and polymer-coated urea, each at

122 and 244 kg N ha-1 yr-1, and no N (control). The SMS-based irrigation applied 32 to 70% less water than frequency-based irrigation. No differences in nitrate leaching occurred between irrigation treatments or among N sources and leaching levels did not exceed 0.6 mg L-1, which is well below EPA thresholds. All fertilized turf had acceptable quality throughout the study. Results indicate that on silt loam soils, SMS-based irrigation saves water compared to standard frequency-based irrigation while providing acceptable quality, and nitrate leaching is negligible. (Josh Chabon, M.S. and Drs. Dale Bremer and Jack Fry).

▲ **Late-season bermudagrass** control with glyphosate, fluazifop and mesotrione combinations for spring renovations

**Irrigation Management, Cutting Height, and Primo Effects on Mowing Requirements of Tall Fescue**. In-ground irrigation systems are often mismanaged, resulting in excessive application of water. In this 2-year study, we evaluated mowing requirements of tall fescue irrigated using frequency-based irrigation and irrigation controlled by soil moisture sensors (SMS). Frequency-based irrigation cycles ran three times weekly regardless of precipitation amounts, and SMS applied water only when soils dried to a predetermined threshold. Within each irrigation treatment, we evaluated mowing at 5.1 cm or 8.9 cm, based upon the 1/3 rule, with or without monthly applications of Primo. In 2012, tall fescue mowed at 5.1 cm and treated with Primo required three fewer mowings than untreated turf mowed at 5.1 cm; at an 8.9 cm cutting height, only one fewer mowing resulted after Primo application. Mowing at 8.9 vs. 5.1 cm, or using Primo vs. not resulted in a 9% reduction in total mowings required in 2013. (Josh Chabon, M.S. and Drs. Dale Bremer and Jack Fry).

**Nitrous Oxide Emissions and Carbon Sequestration in Turfgrass: Effects of Irrigation and N Fertilization**. Nitrous oxide ($N_2O$) and carbon dioxide ($CO_2$) are important greenhouse gases that have been implicated in global climate change, and $N_2O$ is the most important ozone-depleting substance in the atmosphere. Turfgrass covers ~50 million acres in the USA and is typically fertilized with nitrogen and irrigated, which may result in significant $N_2O$ emissions. Turfgrass also has the capacity to sequester or emit $CO_2$ from/into the atmosphere. We are beginning a 3-year study to measure $N_2O$ emissions and carbon sequestration from turfgrass when fertilized with different nitrogen (N) fertilizer types (urea and poly-coated N) and different irrigation regimes. The use of slow-release N fertilizer and deficit irrigation may mitigate $N_2O$ emissions from turf, although deficit irrigation may also reduce carbon sequestration. Therefore, it is important to measure $N_2O$ fluxes and carbon sequestration in turfgrass managed under various combinations of deficit irrigation and fertilized with urea or slow-release N. Our goal is to develop smarter management practices that may reduce $N_2O$ emissions from turfgrass and enhance carbon sequestration in turf soils, which could help mitigate climate change and atmospheric ozone destruction. (Ross Braun, M.S. student, and Drs. Dale Bremer and Jack Fry).

**Rough Bluegrass Physiology and Control**. Rough bluegrass (RBG, *Poa trivialis* L.) is a difficult-to-control weed that commonly develops in cool-season turfgrasses due to vegetative propagation of stolons and contamination from seed lots. Rough bluegrass is less tolerant of heat stress than desirable cool-season species such as tall fescue (TF), and often declines during mid-summer due to biotic or abiotic stresses. The objectives of these 2011-2013 controlled environment and field studies were to 1) observe growth and physiological differences between 'Laser' and 'Pulsar' RBG and TF; 2) differentiate between physiological and pathological contributors to RBG decline; 3) determine the effects of TF seeding rate and mowing height on TF/RBG establishment when RBG is a seed contaminant; 4) evaluate herbicide combinations for selective RBG control; and 5) evaluate seasonal timing of glyphosate for nonselective RBG control. Tall fescue was less affected by elevated temperature than RBG. When subjected to 35°C, Laser and Pulsar experienced similar reductions in quality, gross photosynthesis, shoot and root biomass, and root length density compared to when grown at 23°C. Evaluation of RBG foliage and roots did not reveal a fungal pathogen associated with RBG decline. Still, repeated applications of strobilurin fungicides increased RBG quality and cover during summer compared to untreated RBG, possibly due to poorly understood non-target physiological effects of the fungicides. Mowing TF at 7.6 or 11.4 cm reduced RBG incidence up to 57% compared to mowing at 3.8 cm. Tall fescue seeding rate had no effect on RBG incidence. Several herbicides and herbicide combinations provided transient RBG control in the field, but Velocity was the only treatment that provided RBG control (16 to 92%) in Manhattan, KS; Hutchinson, KS; and Mead, NE. Spring-applied glyphosate resulted in the lowest RBG coverage (1 to 31%) among field studies in Manhattan and Mead, followed by late-summer applications (6 to 58%), and mid-summer applications (9 to 86%). (Drs. Cole Thompson, Jack Fry, and Megan Kennelly; Univ. of Nebraska Cooperators: Dr. Zac Reicher, Mr. Matt Sousek).

**Using Colorants to Improve Color of Dormant Warm-Season Turfgrasses in the Transition Zone**'Chisholm' zoysiagrass (*Zoysia japonica*) is a new cultivar that is well adapted to the transition zone, with low maintenance requirements, and good quality and drought

resistance. However, some turf managers object to the brown color of dormant Chisholm. The objective of this experiment was to determine if turfgrass colorants or overseeding could enhance winter color. Field studies were conducted in Manhattan and Haysville, KS from October 2012 to May 2013. Treatments included the colorants Green Lawnger and Ultradwarf Super, applied once (autumn) or twice (autumn plus mid-winter), annual ryegrass overseeding, a tall fescue control, and an untreated control. For the fall application, colorants were applied at a dilution rate of 1:6 (colorant:water) at 1225 L/ha on 21 October (turf 5-10% green) in Manhattan and 31 October in Haysville. Mid-winter applications were done on 23 January in Manhattan and 5 February in Haysville. Prior to overseeding, turf was vertically mowed, then seeded with annual ryegrass at 488 kg/ha on 28 September in Manhattan and on 11 October in Haysville. Visual color was rated weekly on a 1 to 9 scale in which 1 = straw brown; 6 = acceptable color, and 9 = dark green. A single application of Green Lawnger provided acceptable color for 14 weeks after treatment (WAT) at both sites. At 14 WAT, a second application resulted in acceptable turf color until spring green up in early May. Ultradwarf Super applied once provided acceptable color for 6 WAT in Manhattan and 10 WAT in Haysville, resulting in an 8 and 4 week period, respectively, of unacceptable color until the second application. Overseeding provided 4 weeks of acceptable color beginning 4 weeks after seeding in Manhattan, but color was not acceptable in Haysville. Chisholm color was enhanced with colorant application, which could make this cultivar more desirable. (Ross Braun, M.S. student, and Drs. Jack Fry, Megan Kennelly, Dale Bremer, and Jason Griffin).

**Late-Season Bermudagrass Control with Glyphosate, Fluazifop and Mesotrione Combinations for Spring Renovation**. Common non-selective bermudagrass removal recommendations include multiple applications of glyphosate, while bermudagrass is actively growing. This application results in non-aesthetically pleasing and non-functional turfgrass throughout the summer. Turfgrass managers do not always have the opportunity for this application timing. Two research trials were initiated in Fall of 2013 in Manhattan, KS to determine non-selective bermudagrass control with glyphosate, fluazifop and mesotrione combinations prior to winter dormancy. Individual and all possible combinations of glyphosate, fluazifop and mesotrione applications were conducted October 9, 2014. Any treatment containing glyphosate resulted in <25% green cover 7 days after application. By October 31, 2013 all treatments including the non-treated resulted in <5% green cover. Final results could potentially provide new herbicide combinations for Fall bermudagrass control for Spring renovation. (Drs. Jared Hoyle and Cole Thompson)

**'Cody' Buffalograss Tolerance to Combination Post-Emergence Herbicides**. With the increase pressure to reduce irrigation on turfgrass systems, a low-input turfgrass species, buffalograss, has become more widely accepted in the Mid-West. Although, options for sedge, broadleaf, and grass weed control in buffalograss are limited and applications have previously resulted in unacceptable buffalograss injury. Experiments were conducted in 2013, in Haysville, KS to evaluate 'Cody' buffalograss tolerance to various broad-spectrum postemergent herbicides. 'Cody' buffalograss was maintained at 7.6 cm and irrigated as needed. Not all herbicides used in this study are labeled for use on buffalograss. Rates of herbicides were either maximum labeled rate or maximum labeled rate for a labeled warm-season turfgrass. Herbicide treatments included Celsius, Katana, Q4Plus, Speed Zone, Surge, Trimec Classic, T-Zone, Drive XLR8, Battleship III, EndRun, Solitare, Dismiss, QuickSilver, Blindside, and SquareOne. Plots were treated with herbicides on July 1, 2013. No buffalograss injury was observed 7 DAT with Katana or QuickSilver. Slight buffalograss phytotoxicity (0 to10%) was observed 7 days after treatment (DAT) on research plots treated with Celsius, Q4Plus, Surge, Drive XLR8, Solitare, Dismiss, Blindside, and SquareOne. Applications of Speed Zone, Trimec Classic, T-Zone, Battleship and EndRun resulted in > 14% buffalograss phytotoxicity. By 28 DAT all herbicide treatments excluding SpeedZone (< 10%) and T-Zone (< 5%), resulted in no buffalograss phytotoxicity. With the increasing use of buffalograss in low-input turfgrass systems, combination herbicides may cause slight injury but are a viable option for weed control. (Dr. Jared A. Hoyle)

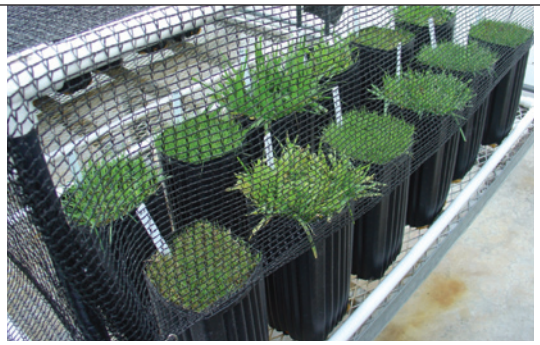
**Turf Paint and Glyphosate Application Timing Effects on Annual Bluegrass Control and Zoysiagrass Spring Green-up**. Turfgrass managers commonly apply glyphosate on dormant zoysiagrass to control winter annual weeds. More recently, turfgrass managers are using paints and pigments to color dormant zoysiagrass throughout the winter months. Glyphosate application on dormant zoysiagrass is well documented, but information about the interaction of glyphosate and paint applications is lacking. A field study was conducted to evaluate the effects of glyphosate and glyphosate + Endurant (Turfgrass Colorant) timing applications for annual bluegrass control and zoysiagrass spring green-up. Treatments included a non-treated, glyphosate and glyphosate + Endurant applications applied in November, December, January and February (9 total treatments). Initial results indicate that all glyphosate and glyphosate + Endurant applications, across all timings, reduced annual bluegrass populations. Previous research has shown that early applications of glyphosate on zoysiagrass when turf is not completely dormant can result in delayed spring green-up and injury. Initial zoysiagrass Spring green-up observations demonstrate that the addition of Endurant to glyphosate at early applications (November) may increase glyphosate safety on zoysiagrass. (Dr. Jared A. Hoyle and Mr. Jake Reeves)

## UNIVERSITY OF FLORIDA

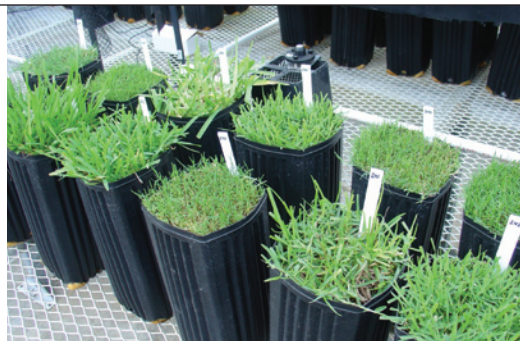
**Daily Light Integral Requirements for 12 Warm-Season Turfgrasses**. This study was conducted by Brian Glenn and Jason Kruse, PhD, University of Florida, Gainesville; and J. Bryan Unruh, PhD, University of Florida, Jay, FL.

If you have it, shade can cause turfgrass maintenance challenges on athletic fields. After water, temperature, and nutrition requirements are met, light interception is the growth-limiting factor for turfgrass. In many cases, shade on athletic fields can be caused by stadium superstructure resulting in various microclimates on the field as the sun moves across the sky. Stadiums that may experience these areas are increasing, as many sports are trying to improve game-day comforts using air conditioning and retractable roofs. Shade can be even more detrimental when using warm-season turfgrass, which require more sun for optimal growth (Figure 1). As these turfgrasses sense cues

▲ **Figure 1.** Shade on bermudagrass



▲ **Figure 2.** Twelve warm-season turfgrass species under 30% shade



▲ **Figure 3.** Twelve warm-season turfgrass species

associate with lower light, they begin to react and try to "grow out" of shaded conditions. This is usually seen as elongated, thin leaves, and can lead to unsightly scalping. If light levels are not increased, turfgrass quality will eventually begin to decline.

Daily light integral, or DLI, is a method of measuring light that quantifies total light intensity accumulated during the course of a day. It is measured in moles of light per meter squared per day (mol/m2/day). In the past, light has been reported in hours of full sun or percent shade. These are often vague as incoming solar radiation changes periodically due to sun movement, cloud cover, and changing shadows caused by objects such as buildings and trees. DLI is a more precise method to evaluate available light in a given location on the field, as it takes into account the dynamic nature of shade.

To put DLI into perspective, the average summer ranges are 40-45 moles in the eastern U.S., and can get as high as 60 moles in parts of the southwestern US. These ranges can fall significantly during the winter months. In certain areas where warm-season turfgrass is grown year-round, ranges can drop to as low as 15 moles. If these levels are already marginal for growing a specific turfgrass in your area, reductions in light caused by shade can further impact turf quality and growth.

By using some light-monitoring equipment, turfgrass managers can easily determine exactly how much light is falling on a particular site. The question becomes, how can this information be used to make more informed decisions about turfgrass management from a species standpoint? We set out to determine threshold light levels using DLI to maintain quality turfgrass. We also wanted to see how much temperature impacted these DLI requirements, so that managers could determine if the amount of light measured was adequate for their turf, no matter the time of the year.

Greenhouse trials were conducted at the Turfgrass Envirotron at the University of Florida over 2 years to evaluate minimum DLI requirements to maintain acceptable turfgrass quality for twelve warm-season turfgrasses (Figure 2). Four treatments (0%, 30%, 60% and 90% shade) were used to develop a light gradient to determine the point at which turfgrass quality becomes unacceptable (Figure 3). These grasses were shaded for a period of two months. All treatments simulated either summer or winter average temperatures in south Florida (87 F and 74 F, respectively).

When DLI requirements were calculated after the trials were completed, there was a substantial difference between the summer and winter ranges (Table 1). The highest requirement from the grasses that were included was 22 moles, where that number dropped down to around 11 moles during lower temperatures. Turfgrasses in both temperatures were actively growing, but the samples in the cooler environment seemed to tolerate shade better. The answer can most likely be attributed to lower energy demands on the turf with lower temperatures, allowing the plant to maintain quality without as much light.

▲ **Figure 4.** DLI100 Light Meter from Spectrum Technologies.

Many of the results when comparing grasses were expected based on past research and observations. Bermudagrass had the highest light requirements, while the zoysiagrasses had the lowest. Some of the species that were selected for the studies are marketed for their "shade tolerance," including Celebration and TifGrand bermudagrasses.

Now that we have an idea of the relative light requirements for different grasses, how can they be used? With the right tools, this information can help turfgrass managers establish a starting point when dealing with shade on their fields. One instrument that can be used is a small light sensor that measures DLI over a 24 hour period (Figure 4). After a few days of monitoring, the average DLI can be determined for the site. Multiple units can be used across a field if various microclimates exist. If the DLI is below the requirement for the given season and declines in turf quality have been observed, a different turfgrass species with a lower DLI requirement may be recommended.

These values are an approximation for each of the species tested, but different factors can potentially alter DLI requirements for a specific grass. Low mowing heights could lead to unacceptable turfgrass quality, even with an acceptable amount of light. Using a plant growth regulator (PGR) could lead to higher quality under lower light levels. Minimum acceptable quality may also not be acceptable on high profile sports turf, so these requirements may need to be adjusted according to expectations. When used for comparison purposes, these values can help managers determine if quality issues are a product of shade or if another possibility should be considered.

Research using DLI is ongoing, including determining the effect of different mowing heights on DLI requirements within the same species. New information using DLI could potentially help managers account for the effects of low light on turfgrass growth. Raising mowing heights, applying PGRs, and other cultural practices could be proactively altered to maximize turfgrass health and minimize negative effects due to shade and other reductions in light. ■

▶ Dimple seeding

▲ **Adding** ≤ inch of topdressing

▲ **First day** of mowing 20 days after seeding

▲ The organic layer

# FROM SEED TO PLAYING IN 35 DAYS

**JUST 35 MILES NORTHWEST OF WASHINGTON, DC,** sits an athletic oasis. Each year, thousands of athletes from around the world visit the Maryland SoccerPlex, a 600-acre park consisting of 22 pitches. The facility includes 16 native soil pitches (9 cool season, 7 bermudagrass), three sand-based pitches (1 cool season, 2 bermudagrass), and three synthetic fields. The Soccerplex has hosted everything from MLS Open Cup matches to the University of Maryland rugby team.

In the heart of the facility sits the Maureen Hendricks Field. In 2012, our crew decided that even though the stadium pitch was good, it could be better. The end goal of our thinking was for the pitch to be able to sustain more use while requiring less water and fungicides.

To make the pitch the best that it could be it needed to be renovated due to three main reasons: to remove the built-up organic layer, to eradicate the inherited*Poa annua* population, and to return the pitch to its original grade.

The pitch consisted of a 4-inch heavy organic layer. This layer was comprised of 11/2-inch thick cut sod and 21/2 inches of organic build-up that was consistent with all fields in our complex over a 12-year span. Clippings and the use of low-quality organic compost caused this organic layer. By

removing the 4-inch heavy organic layer, it would increase drainage capacity and air movement and reduce the compaction potential. The original pitch also had stability fibers mixed into the soil profile, but with the existing 4-inch layer, those fibers were not being used. By removing the layer, the grass roots would be able to wrap around those fibers to give the pitch a more durable playing surface, allowing it to handle more traffic.

Removing the inherited *Poa* infestation would make the field more aesthetically pleasing and be able to sustain more traffic. It would also reduce the stress tolerance of the pitch and the water use. Not only would the pitch use fewer pesticides, but would also be less susceptible to winter injury.

The third reason for the renovation was to return the field to its original grade, which is essential for a successful pitch. Due to the inconsistent grade, there were major drainage issues, such as puddling and unhealthy turf. Getting back to the original grade would allow for an ideal drainage pattern, allowing the water to move smoothly across the surface grade and to filter into the soil.

| Factors | Seed | Sod |
|---|---|---|
| Cost (approximate) | $Ft^2$=$17.77<br>Total Seed Cost=$1,600 | $Ft^2$=$833.33<br>Sod/Trucking =$60,000<br>Sod Install=$$15,000<br>Total Sod Cost=$75,000 |
| Timeline | Variable grow-in times<br>Newer seed technologies boast faster germination and establishment | "Quick Fix"<br>Playable in 1-2 weeks |
| Layer Issue | No layer created from immediate seed-to-soil contact | Virtually impossible to match sand of the sod to the sand of your existing profile<br>Creates inevitable layering problems, drainage and air exchange issues |

Growth Chart

| Renovation Process | |
|---|---|
| 1. Cut out existing field | 8. Roll second time |
| 2. Topdress 3/4" 100% sand | 9. Initial granular fertilizer |
| 3. Laser Grade | 10. Topdress 1/4" (85% sand 15% peat) |
| 4. Recycle Dress | 11. Apply paper mulch |
| 5. Mesh Drag | 12. Water |
| 6. Roll | 13. Foliar fertilize |
| 7.Seed | 14. Mowing |

Revovation Process Chart

After the issues of the existing pitch were determined, the problem solving stage came next. Would there be a full renovation to cut out the existing field and replace it, or would there be gradual amendments used, such as core aerification, topdressing and overseeding? Because the organic layer was too large and the *Poa* infestation was too severe to reduce without the use of chemical control, the gradual amendment option was thrown out.

When deciding to go with a full renovation there were two options, sod or seed. Below is a chart of the factors that went into determining whether we should seed or sod the pitch:

European influence also had an impact on the decision making process. Many premier pitches in Europe renovate annually and are considered to be some of the best in the world. They are all almost exclusively done with seed. When our crew talked to a European field expert, he asked us, "Why would we sod when we had this open window of time to seed?" Seeding is the "norm" across the pond, and they simply could not understand why we debated between the two.

Not only were we looking at all options, but we also wanted to challenge ourselves in the whole process. The general consensus was that we had to sod. We heard doubt from all angles when we proposed growing a stable Kentucky bluegrass stand and prepare it for use in just 35 days. Our different ways of thinking pushed us past the "norm," and our crew began to think that this would be a great opportunity to push the envelope and test the newest grass genetic technologies out there.

The final decision was to go ahead and seed the field because using the European-style renovation that many top-level clubs have used interested us. There was also an up-front savings that was too large to ignore, and growing from seed would eliminate any potential sod layer. Choosing this option defied the perception that seeding could not be done. A 35-day grow-in was achievable with the new grass genetics, and it would also challenge us professionally. When deciding to seed, the renovation process was then planned out completely.

The existing field was cut out on the first pass at a 2-inch depth. This removed the top 2 inches of the sod layer. After the first initial cut out was done, the second pass was started, removing the remaining organic layer and exposing the original sand/stability fiber mix.

Using a Speedresser, the pitch was topdressed with 3/4-inch with USGA spec 100% sand. The pitch was then laser graded, which removed all accumulated material and exposed the original grade.

Once the laser grading was complete, a recycling dresser was used to incorporate the new 100% sand with the existing sand, which contained the fiber mix. This process refreshed the existing sand with the new material and combined the new sand with the fibers.

A mesh drag was then used to break up the clumps and bunches of soil and fibers. Following that, a three-ton double-drum roller was used on the pitch. By doing this, we created a stable base for the seeding and topdressing equipment.

▲ **These photos** were taken on day 8 of the process. The picture on the left was taken at 10 am; after that photo, a package of biostimulants was applied to the field. The picture on the right was taken at 2 pm of that same day.

Next came the most important part of the renovation, seeding. All seed that was applied had a Germinex seed coating powder. Three separate varieties of Kentucky bluegrass were used at 5 lb/M. The new genetics in Kentucky bluegrass allows for rapid germination, aggressiveness, disease tolerance, and early spring green-up. The seed was applied with a tractor-mounted dimple seeder. Because of a heavy rainstorm that was going to hit the Maryland area later in the week, a new variety of Perennial ryegrass was applied to the pitch with a rotary walk-behind spreader at 1 lb/M. This was applied because of its quick germination and stolon production, which accelerated stabilization.

The pitch was then ready for the second roll using the same three-ton double-drum roller as before. When seeding, the dimple seeder loosened the soil when it created the seedbed. By rolling, it stabilized the material and promoted maximum seed-to-soil contact. Seed-to-soil contact is the key to a fast, successful grow-in.

As soon as the field was cut off, a soil test was conducted. We wanted to make sure that we kept our fertilization program simple and gave the plant exactly what it needed. The first granular fertilizer application was on the first sign of germination. A 19-0-19 50% slow release was applied for the plant to have a base and equal ratio of nitrogen (N) and potassium (K). We also wanted the roots to have a consistent diet. On day 5 after germination, an 18-24-12 was applied to add phosphorus (P) to promote root growth. On day 10, another soil test was taken because of the amount of water that had been put on the pitch to promote seed germination. This test showed that the pitch was still lacking P and was deficient in magnesium (Mg), so on day 14, Crystal Green 5-28-0 10% Mg was applied. On day 21, a 19-0-19 50% slow release was applied.

The second topdressing pass consisted of ¾-inch 85% sand and 15% peat mix. Using the small amount of peat helped to hold moisture for the seed to germinate and establish.

▼ **10 weeks** after seeding for ACC Men's Championship Game.

Paper-based biodegradable mulch was then put out over the pitch by using a topdresser. This was used because the area was anticipating a heavy rainfall event. This material aided in preventing seed from washing away.

Initially, the water program was very heavy. The water needed to "set-in" the profile and break the seed coat, which also promotes germination of the seed. After the initial germination, there were continual cycles of water, keeping seed moist through the germination and establishment process. Gradually the water was backed off, forcing the plant to push roots.

Foliar fertilization allowed us to give the plant what it needed at the exact moment in time. A package of biostimulants that was prescribed specifically for each growth stage was applied. Biostimulants are organic products (plant hormones, carbohydrates, amino acids, and anti-oxidants) that assist the plant in the respiration and photosynthesis process. By using these hormones, the pitch could be grown in an efficient, healthy way. If only N was mostly used, the shoot growth would have been pushed. We were more concentrated on root mass/growth and strong cell walls to aid the plant to withstand heavy traffic.

During post-germination, the pitch was sprayed on a 4-day cycle. This provided the plant with what it needed, without expending the energy to create it. The package of biostimulants was to acclimate the plant and to make it wake up. This is equivalent to humans waking up and drinking a cup of coffee in the morning, or taking daily vitamins.

The first cut of the pitch was 20 days after seeding with a Denis Pedestrian mower until day 30, when a triplex mower replaced it. We cut the pitch every 2-3 days at 1 inch and then worked our way down to 9/16 inch where the height stayed the rest of the 2012 and 2013 season. This height was maintained to force the plant to grow sideways.

It was evident after 20 days with the amount of growth and density already visible on the pitch, that a 35-day grow-in was possible. With great seedbed preparation, water use, consistent mowing, and a foliar fertilization plan that was focused on healthy plant growth and root development, a playable, dense and tight playing surface was on its way to being fully developed. This process not only made us learn about new technologies in our industry, but it also taught us that going against the "norm" can lead to an outcome that could change our way of thinking forever. Like all projects and renovations, we learned many lessons. Looking back, there are two things that we would do differently, if the pitch were to be renovated to this extent again. The pitch would not have had the Perennial ryegrass spread out. The Kentucky bluegrass would have withstood the rainstorm that we had expected that week. It also would have received a second topdressing that consisted of 100% sand instead of the ¾-inch mixture of 85% sand and 15% peat mix. By mixing in the 15% peat, a minor layer was created on the pitch. To fix this problem, the stadium pitch was fraze mowed at ¼ inch in the fall of 2013 after withstanding 167 events in 6 months.

In the past two years, our industry has had new technology and new grass genetics introduced. Because of this, seeding is possible! Thinking outside the box can turn impossibility into possibility. Thanks to using new technologies, plant feeding, and soil stabilization, 11 weeks after seeding, the Maureen Hendricks Field held 20 events in 14 days, including the ACC Men's Soccer Championships.

Each season and field provides new lessons to all of us, but with creative thinking, extensive research, and trial and error, all problems can be solved. It is important to keep an open line of communication with directors, players, and coaches, which will allow everyone to be comfortable with the renovation at hand. Most importantly, it helps to have a positive mindset through the good and the bad. You must believe in what you are doing because if you don't, why should anyone else? If a problem arises, learn from it and move on in order to fix that problem. It is so important to meet old challenges with new creative and energized attitudes.

M.C. Escher once said, "Only those who attempt the absurd, will achieve the impossible." It is up to each and every one of us to continue to improve fields and open the minds of others to the idea that grass fields can and will take more traffic. ■

*Presented at the 2014 STMA by Julie Adamski, director of retail and professional development for Sod Solutions, Inc., and Ryan Bjorn, director of grounds and environmental management at the Maryland SoccerPlex..*

# POST-EMERGENT HERBICIDE Q&A

**For an overview of post-emergence weed** control, including herbicide selection and overall application strategies *SportsTurf* recently sought the insights of Ken Hutto, technical service manager at FMC Professional Solutions.

**SportsTurf:** Have there been noticeable changes in post-emergent control results since MSMA was banned?

**Hutto:** MSMA was a valuable tool for postemergence weed control. It provided effective control of annual and perennial grass weeds, but could also be used for nutsedge, kyllinga, and certain broadleaf weeds.

The biggest void created when MSMA restrictions were issued was getting effective postemergence perennial grass control, most notably of dallisgrass. Since then, controlling dallisgrass has changed dramatically, not only because of the products now available, but because of when those products are applied. MSMA was solely used in the summer months, but some of the newer products are recommended for use in the fall and early summer for effective dallisgrass control. It is a change in application philosophy.

---

**SportsTurf:** Please share your general post-emergent herbicide strategies for cool-season and warm-season athletic turf.

**Hutto:** Establishing a competitive turf is a must for successful long-term weed control. A close second is correct weed identification. What looks like crabgrass may not be crabgrass! Many grasses without a seedhead look like crabgrass. If you do not know what you are dealing with, how will you know what products are most effective?

◀ Ken Hutto, PhD

Not all grass herbicides control all grasses. Likewise, some broadleaf weed materials will control prostrate knotweed better than others. In general, postemergence herbicides are most effective when the target weeds are in young growth stages. Depending on the sport, turf type and weed, sports turf managers may not be able to make postemergence treatments during this life cycle stage due to play. If possible, delay mowing events one day on each side of the application to ensure maximum herbicide absorption into the target weed.

Resistant weeds are becoming more and more prevalent, so rotating modes-of-action is important if other options are labeled for use in the desired turf. When interseeding, be aware of seeding restrictions on herbicide labels, as some postemergence herbicides may negatively impact new seedling establishment if applied too early in seedling development.

Lastly, don't forget about cultural practices! Aerifying high traffic areas to alleviate compacted areas will aid in reducing environments conducive to goosegrass.

---

**SportsTurf:** Are there different products and/or strategies for post-emergence control of grassy weeds and broadleaf weeds?

**Hutto:** There are probably more broadleaf weed herbicide options than grass herbicide options. Choosing the right postemergence herbicide will depend upon what weed spectrum you are dealing with.

Your most common th ree-way postemergence broadleaf weed herbicides can be used in most cool and warm-season turf and can be very effective. However, having such a wide range of turf tolerance is not always the case for postemergence grass herbicides.

For example, Solitare herbicide can be used for postemergence crabgrass, broadleaf, and nutsedge control in both cool and warm-season turf. Some sulfonylurea herbicides can be used for goosegrass control, but only in warm-season turf. Some of the newer "bleaching" herbicides are primarily labeled for cool-season turfgrass use.

Understanding your weed spectrum and what products are available for use in your specific turfgrass will be a big part in developing an effective weed-control strategy.

---

**SportsTurf:** Are there any new post-emergent herbicides near market that you can discuss?

**Hutto:** FMC is always working diligently to bring the next customer driven innovation to market. Our goal is to help turfgrass managers be more efficient in their weed-control programs. ■

*Hutto joined FMC in 2007. He received a Bachelor of Science degree in Microbiology from Auburn University and Master of Science and Doctorate degrees in Weed Science specializing in Turfgrass Weed Management from Mississippi State University. After receiving his PhD, he worked at the University of Florida as a post-doctoral research associate at the West Florida Research and Education Center, conducting research in turfgrass science.*

# POST-EMERGENT HERBICIDE Q&A

**For an overview of post-emergence weed control,** including herbicide selection and overall application strategies *SportsTurf* recently sought the insights of Dean Mosdell, PhD, field technical manager — west, at Syngenta Lawn & Garden.

**SportsTurf:** Have there been noticeable changes in post-emergent control results since MSMA was banned?

**Mosdell:** Weed control strategies have changed slightly. MSMA provided an inexpensive solution for many monocot weeds. Strategies may have greater emphasis on making pre-emergence more effective, such as timing or split/multiple applications. There are several post-emergence herbicides available for warm and cool-season turf, but are narrow in spectrum and/or safety on various turf species. The biggest gap in weed control without MSMA is dallisgrass control in cool-season turf.

**SportsTurf:** Please share your general post-emergent herbicide strategies for cool-season and warm-season athletic turf.

**Mosdell:** Selection is based on weeds present and turf type. Any strategy would need to consider turf type, weed targets and best timing for weed control that works into the use schedule and maintenance program of the athletic field.

**SportsTurf:** In general, what is the best strategy for post-emergence weed control?

**Mosdell:** Again, strategy would be based on weeds present and turf type. Dicot weeds can be controlled with pre-mixes of growth-regulating-type herbicides such as 2,4-D, dicamba, triclopyr, MCPA and others. There are numerous mixes that vary in ratios and components of these herbicides to improve the safety on certain turf types. There are fewer options to control grass weeds post-emergence. The most common summer annual grass is crabgrass. Options for control include products that contain quinclorac, or Tenacity and Acclaim herbicides. On warm-season turf, other options include ALS-inhibiting herbicides such as Monument or pre-mixes of several of these ALS herbicides. Older triazine chemistry is still used on warm-season turfgrasses. It's important to read the label for safety on turf species as they vary widely and mixtures may further reduce labeled turf species.

**SportsTurf:** Are there different products and/or strategies for post-emergence control of grassy weeds and broadleaf weeds?

**Mosdell:** Yes, with few exceptions most post-emergence herbicides are effective on either dicots or monocot weed species. Tenacity herbicide, with pre- and post-emergence activity, will control crabgrass as well as dandelion, oxalis and speedwells. In the herbicide screening process it is difficult to select for a broad spectrum grass herbicide to control a grass weed in turfgrasses since their physiology is similar. An effective strategy is to use a pre-emergence herbicide and treat any escapes of grass weeds with a post-emergence. There are man y effective post-emergence herbicides to control dicot weeds. Best strategy is to maintain a healthy turf stand and control any dicot weeds that pop-up with a broadleaf herbicide. There are many to choose from depending on weed species and turf type.

» I think in the near term there will be mixtures of post-emergence herbicides, similar to the broadleaf herbicide products, to improve spectrum, efficacy and turf safety. With the loss of MSMA in several markets, opportunities exist for new post-emergence grass herbicides.

**SportsTurf:** Are there any new post-emergent herbicides near market that you can discuss?

**Mosdell:** I think in the near term there will be mixtures of post-emergence herbicides, similar to the broadleaf herbicide products, to improve spectrum, efficacy and turf safety. With the loss of MSMA in several markets, opportunities exist for new post-emergence grass herbicides. ■

*Dean Mosdell, Ph.D. is field technical manager <dash> west, for the Syngenta Lawn & Garden. His responsibilities include product stewardship, field testing and technical support of Syngenta products in turf markets for the western United States. Mosdell has more than 25 years of experience in developing plant growth regulating products for application on turfgrasses, including the introduction of the first PGR for fine turf. He holds both a BS and an MS degree in Agronomy (Turfgrass Specialty), from Virginia Tech in Blacksburg, Va., and a Ph.D from Purdue University in West Lafayette, Ind.*

*Always read and follow label instructions. Some products may not be registered for sale or use in all states or counties. Please check with your state or local Extension Service to ensure registration status. Monument and Tenacity are trademarks of a Syngenta Group Company. Acclaim is a trademark of Bayer CropScience LP.*


# Limiting liability for your sports facility

**There are a lot of reasons to love a great stadium—your** favorite team plays there, the seats have great views, it's the home of fond memories. Maybe it just has the best sushi in town. But when you run a sports venue, it's the less glamorous issues that keep you up at night: like how to limit the facility's liability. Because if you don't keep your facility safe and your liability limited, the results can be catastrophic.

## WAIT, WHAT'S LIABILITY?

Put simply, liability is the risk that your organization will be sued for injuries (or property damage) that occur at your facility. You can never entirely eliminate liability, because some disasters simply aren't foreseeable. But if you make your facility as safe as possible, obtain waivers, and purchase liability insurance, you can dramatically reduce your risk.

## SAFETY

Operating a safe sporting facility is the first step in limiting your liability. The primary reason why prioritizing safety will limit liability is that in order for players or visitors to win a lawsuit against the facility, they must first show that they or their property were harmed. If there's no injury, there's no basis for a lawsuit.

Even if something goes wrong and someone is injured, facilities that have done everything in their power to ensure that visitors are safe will be exposed to less liability. That's because venues can generally be held liable for injuries that result from situations that they knew or should have known were dangerous. If you know something is dangerous, you are obligated to mitigate that risk.

## ON THE FIELD

Take, for example, a football field. If you place a wall too close to the end zone, it's reasonable to expect that a player may accidently run in to it and injure himself. When the wall is already in place, it can be tempting to ignore the potential risk. But if a player does get hurt, he will have a strong claim that you were negligent because you should have anticipated how dangerous the wall was. It's far better to be cautious and attempt to mitigate the risk by padding (or even removing) the wall.

Another common source of injuries in facilities that cater to children, students, and community athletes are unanchored soccer goals. Weighting the bases of goals may be enough to keep them in place during most games. But when the game is over, and people are using the field for everything from Frisbee games to tailgates, unsecured goals can become hazardous. Over the last 50 years, close 100 people have been killed or seriously injured as a result of soccer goals falling on them. Many of those people may have been reckless—maybe they were hanging from the goal or attempting to climb it. But as a facility manager, you are expected to anticipate that people will do risky things, and you're expected to take precautions to limit the possibility that they will be injured.

Finally, it's important to remember that you need to be just as conscientious about maintaining safe practice facilities as you are about the primary field or court. Injuries that happen during practices (and the resulting suits) can be just as catastrophic as those that happen during the big game.

## AND OFF THE FIELD

Facilities also need to minimize the risk to spectators. Visitors often sue for injuries wholly unrelated to the main sporting event, from slip-and-fall

*Image ©istockphoto.com/iqoncept.*

cases, to injuries they sustain from other fans. Here, again, the best way to avoid a lawsuit is by preventing people from getting injured. That can mean trying to keep the floors dry (many venues sale all their drinks in oversize cups or cans to limit spilling). But it can also mean making sure you have adequate security to prevent spectators from getting into fights.

Put simply, if you run your facility well and take reasonable precautions to ensure that patrons are safe, you will not only minimize injuries but also limit your liability in the event that someone is injured.

## EXCEPTIONS TO THE RULE

While facilities can be found liable for a wide range of injuries, they are generally not liable for injuries that are a direct result of the game. Essentially, the thinking goes that by playing sports at all, athletes assume certain risks. The facility is generally not liable for those injuries, unless its negligence helped cause the injury. For example, a football player who sustains a knee injury when he's tackled would be unlikely to win a case against the stadium, because that's a regular part of playing the game. However, if the same player sustains an injury because of the poor condition of the field, he may well have a claim against the stadium.

The same principal usually applies to spectators. For example, courts have found that by going to a baseball game, fans assume the risk of being hit by balls and broken bats that fly into the stands. As a result, they are unlikely to win a suit against the facility for their injuries. If the facility's negligence contributed to the injury, however, it may still be held liable.

As a manager, you need to think defensively in order to limit liability. Try to anticipate what could go wrong at your facility, and then think about what you can do to limit the risk. If you notice a potential hazard, take care of it as soon as possible.

## TRAINING WORKERS

Good employees are essential to maintaining a safe and well run facility. As a facility manager, you should make sure that your workers understand that safety is a high priority for your organization. Establish clear policies so that workers who spot something that could be dangerous know what to do and who to take their concerns to. Find the areas where poor maintenance might lead to safety concerns and do routine checks to make sure everything is in order. Train employees to use checklists so they don't miss safety steps. And when you're hiring new workers, try to assess whether they will be safety conscious and committed to making sure the facility is as safe as possible. If you take safety seriously, your staff will too.

## WAIVERS

No matter how cautious you are injuries will happen. In order to limit liability, it is essential for you to require athletes to sign waivers that limit suits against the facility. If the athletes are minors, the waivers must also be signed by their parents.

Waivers typically reiterate that the activity is inherently risky, and the participant waives claims against the facility for any injuries sustained. While waivers are essential for limiting liability (and often required by insurance carriers), they do not eliminate the possibility of being sued.

## LIABILITY INSURANCE

So you've limited your liability by running a safe facility. You've trained your workers, and you've obtained liability waivers from athletes. But something totally unexpected happened, and someone got hurt. Let's say, a light fixture fell from the ceiling. This is exactly the type of disaster liability insurance was made for—the unexpected, but potentially very costly disaster. No matter what other precautions you take, you must obtain adequate liability insurance.

Don't skimp on your insurance policy. You want to avoid the bitter pill of regularly paying premiums only to find that when something does go wrong, it isn't covered because of the fine print. When you're selecting a new policy, you should consult with an expert on fine print, like an agent or attorney, about what coverage your organization needs, and what options exists.

## CLAIMS MADE V. OCCURRENCE POLICIES

Policies typically only cover incidents that happen while they are in effect. But "claims made" policies are even more restrictive. They only cover incidents if the claims themselves are made while you have that policy. So if you switch insurance after the incident, but before a claim is made, *you will not have any coverage for that claim*. This is particularly problematic for facilities that deal with children, because there is usually an exception to the statute of limitations that allows minors to wait till they become adults to make claims.

In contrast, "occurrence" policies cover incidents that happen while they are in effect regardless of when the claim is made. If you switch insurance down the line, the policy will still cover incidents that happened while you had the old policy.

## ATHLETIC PARTICIPATION EXCLUSION

Some policies exclude coverage for athletic participants (typically everyone from players to coaches). This is an unacceptable exclusion for sports facilities. After all, the majority of your claims are almost certain to come from athletes and team staff. No matter how tempting the price tag, these policies are not appropriate for sporting facilities.

## RIDERS AND OTHER COVERAGE

In addition to a general liability insurance policy, your facility should consider riders that offer other types of liability coverage. Depending on how your facility operates, there are some common riders you should consider. If your facility serves alcohol, you should be sure to purchase liquor liability coverage. You should also consider some form of business auto liability coverage (i.e., a policy that covers any accidents employees get into while driving their personal vehicle for work purposes). Finally, if you have a large staff, you may wish to purchase employee benefits liability coverage, which will protect you from claims of negligence in the administration of employee benefit programs.

You can't eliminate liability or the possibility of an accident at your facility. But by taking careful precautions and obtaining adequate insurance, you can make your facility's liability manageable. ■

*This article provides general information on facility liability matters and should not be relied upon as legal advice. A qualified attorney must analyze all relevant facts and apply the applicable law to any matter before legal advice can be given. Patrick McGuiness is a partner at Zlimen & McGuiness, PLLC. His law practice focuses on assisting green industry businesses and organizations with a wide range of legal issues. He can be reached at pmcguiness@zmattorneys.com.*

# A "BASIC" TRIP OVERSEAS REVEALS WHAT MATTERS IN TURF CARE

**Safety, playability and aesthetics are the** objectives of the sports turf manager. The single best way to achieve these three goals is having grass cover. Healthy, dense turfgrass goes a long way in assuring a field that is safe for the athletes, plays well and looks great. Detrimental to achieving an outstanding playing surface is wear, whether it is on a municipal field or at a professional stadium. Heavy wear affects footing, field hardness, consistency and aesthetics. Conquer wear and many problems are solved. Obviously limiting play is number one in combating wear, but beyond that what makes the difference?

Last summer I was fortunate to have travelled to the United Kingdom to further my turf management education. The trip confirmed the deep-rooted concepts on turf management that many of us have been taught. Despite this training, we sometimes pay attention to the fringes of turf management, chasing problems with technology fixes and losing sight of what matters most. *The basics are what matter* when it comes to fighting wear. Growing environment, soil, species and cultivar selection: these are the foundations for fighting wear. They are more important than critical cultural practices. Yes, we need to irrigate properly, aerate, overseed, verticut and fertilize because of their importance, but the basics make the difference.

My first stop in England was at the Sports Turf Research

▼ **The** Yorkshire Dales.

▲ **Wimbledon, Court 1.** Grow-in of new cultivars of perennial ryegrass.

» Much of their turfgrass research is similar to what occurs at American universities with the biggest difference being that **STRI concentrates much of their work on wear tolerance**.

Institute (STRI) in Yorkshire. But before my visit, I was able to do some hiking in the Yorkshire Dales. What does this have to do with sports turf management? On the theme that basics matter, the Yorkshire Dales are a perfect example of the importance of a brilliant growing environment. The Dales are river valleys that have acres and acres of almost perfect grass. No pesticides, fertilizers or irrigation are used and the meadows are frequently mowed by herds of sheep. There are hardly any weeds and the hiking paths show little signs of wear. What they do have is an ideal growing environment. It rarely gets too hot, they receive just the right amount of rain and suitable grass species are used. These vast areas have very few inputs but they are thriving. Proper fundamentals take care of most of their turf management challenges.

From the Yorkshire Dales, I headed to the STRI in Bingley for a tour from Head of Turfgrass Biology, Dr. Andrew Newell. The STRI performs turfgrass research and consults for many of the top sports events in the world such as The Open Championship (British Open), FIFA World Cup and Wimbledon. Much of their turfgrass research is similar to what occurs at American universities with the biggest difference being that STRI concentrates much of their work on wear tolerance. After being subjected to large amounts of artificial play, the differences in cultivar wear tolerance are striking and easy to see with some plots being almost completely deteriorated and some looking like no wear had been applied. Even product testing is aimed at wear tolerance, with many turfgrass plots subjected to different regiments of fertilizers, growth regulators and other products that claim to help with wear. They can scientifically show which of these products are effective and which ones are of little use when fighting wear. Choosing wear tolerant

▲ **Test area plots** at the Sports Turf Research Institute, Bingley, England

cultivars is essential and gives the best possible chance of having a solid sward of grass.

After Yorkshire, I moved on to Wimbledon, home to grass tennis courts that receive some of the most intense play of any sport. With over 400 million television viewers each year and the best tennis players in the world competing, safety, playability and aesthetics are all an integral part of the Championships. To accomplish this, wear must be minimized. Under the leadership of groundsmen Eddie Seaward and Neil Stubley, Wimbledon, along with science-based recommendations from the STRI, has conquered many of their wear problems by making sure they take care of the basics. Devotion to fundamentals has allowed for sections of the grass tennis courts that typically had 10-20% grass cover at the end of the tournament to now have 80% coverage.

The basics for Wimbledon in order of importance are (my ranking):

1. Grass species selection
2. Cultivar selection
3. Measurement
4. Cultural practices

After exhaustive research Wimbledon decided on perennial ryegrass as their preferred species. No grass is a perfect fit for tennis, but ryegrass offers the best balance between wear tolerance and playability. Along with this they have declared all-out war on *Poa annua*. Each grass court is stripped after the Championships and replanted with ryegrass so that *Poa* has virtually been eliminated from the courts. Using the best species that meet their particular tennis requirements gives them the head start they need to deal with massive amounts of play in concentrated areas.

Choice of perennial ryegrass cultivars evolves almost every year so that new, improved grasses are being introduced. Wear tolerance is not the only criteria used to select cultivars; color (both winter and summer), texture and ability to tolerate mowing at 8mm are also essential. Picking the right varieties can make the difference between having no grass or 80% coverage on high play areas of the court.

Ranking measurement third ahead of cultural practices may seem out of order for most of us, but for a tennis tournament that needs perfection on the courts for 2 weeks straight, there is no question of its importance. Groundsmen know exactly how much moisture is in each court, how firm they are, and how much grass coverage they have each day so informed decisions can be made on cultural practices leading up to the tournament and precise decisions can be made during the tournament. All 19 Championship courts are prepared to be consistent with each other and records are kept so that tournament officials, players and groundsmen know exactly how the courts played and fared.

Cultural practices are last on my list, but not be because they are unimportant. Wimbledon aerates, verticuts and topdresses frequently and these practices are just as important to their success as they are to all turf managers. Since Wimbledon has taken care of the species, cultivar and measurement aspects, cultural practices are the piece that builds on top of the basics for a superior product and an epic playing surface.

▲ **Cleats on wear machine** at the Sports Turf Research Institute, Bingley, England

As sports turf managers, we have an immense amount of modern resources to assist us in growing grass. Specialty fertilizers, biostimulants, growth regulators, wetting agents are some of the tools many of us use to step up to a next level of quality field. Yes they matter and help, but many times they are used to improve our fields by a small percentage. A trip to the United Kingdom reminded me of the enormous advantages of proper growing environment, choosing the right grass and sound agronomic strategies and that the basics count most when striving to maintain grass cover. ■

*Michael Buras, CSFM, is head groundskeeper at the Longwood Cricket Club, Chestnut Hill, MA.*

▲ **A unique checkerboard pattern** was featured at the Little League Softball World Series at Alpenrose Field in Portland, OR. Photo by Profile Products.

# FIVE STEPS to transform your field for tournament time

***Editor's note:*** *Jeff Salem is a public relations associate at Swanson Russell, based in Lincoln, NE.*

**Tournament season is supposed to be memorable** for all involved, from the teams and players to the parents and spectators who spend an entire weekend, or longer, at the tournament site.

Field managers at any level of play can improve their fields with a few easy steps to ensure that players and spectators are presented with a tournament-ready field that is both presentable and playable.

## 1. MANAGE YOUR INFIELD SKIN

No tournament is going to give spectators and players the sense of something special if the basics aren't covered. Make sure the base infield soil is maintained effectively by dragging the skin and applying moisture. Prevent a dry, cracked infield by watering deeply in the days leading up to the tournament. Incorporating a calcined clay conditioner like into the infield mix will help to hold moisture, releasing it slowly to create a balanced moisture reservoir in the infield mix, giving your field a consistent level of play throughout the tournament. Applying a topdressing layer before play ensures good footing on the surface and gives you a terrific moisture management tool if rains do threaten to disrupt play. Conditioners also help fight compaction and create a cushioned, playable surface.

Also, make sure there are no holes on the pitcher's mound or batter's boxes. Repair any low spots along the infield that could create unsafe conditions or lead to bad hops during play.

## 2. ADD A SPLASH OF COLOR

"Making a field pop goes a long way to creating an atmosphere at the ballpark where the athletes and spectators know that this is a special weekend," says Jeff Langner, brand manager at Turface

▲ **Georgia Tech** chose a dyed conditioner to give its field a distinct look. Photo by Profile Products.

Athletics. "Tournament season is a great time for field managers and tournament hosts to give the diamond a look that leaves a lasting impression."

Oftentimes, Langner says, a little goes a long way to creating that visual impact.

For example, while it can create dramatic visual impact to completely change the infield color with a dyed conditioner, a field manager can apply colored particles in select areas only, at a much lower cost. It only takes a few bags of a professional-level infield conditioner applied to the mound and plate areas to help them stand out.

Other aesthetic changes to think about for tournament season include repainting the coach's boxes and the foul lines in the outfield.

### 3. BETTER THE BASE PATHS

A firm base path means a fast base path, which is a trait of any quality field worthy of tournament play. Top the first and third base paths with calcined clay—about two bags into the top inch of dirt along the paths—and moisten without saturating. Then, roll the paths until they are firm to maintain a safe infield throughout the tournament. Avoid dragging the base paths; instead, hand-rake those areas as necessary, which will keep the infield mix tight.

### 4. PREP THE SKIN

"Keeping a field safe and playable for the athletes should be first and foremost on the mind of any field manager put in charge of a tournament, even more than aesthetic upgrades," Langner says. "Preparing the field for the elements and ensuring the ball bounces true throughout the weekend are great ways to pulling off a tournament worth remembering."

Proper infield maintenance is critical for quality of play for the players. For starters, fix any low spots in the infield before each day of play. These are more likely to occur near the bases, in leadoff areas and sliding pits. Low spots can be built back up by scraping away any loose material or conditioner; adding infield mix to the low spot (preferably matching the sand/silt/clay content of the base soil); and tamping it firm. Repeat this process until the area is up to grade, and then top with a light layer of conditioner.

Also, be on the lookout for lips, which can create dangerous conditions for the players.

Hand-raking the infield edges will prevent materials from building up in the edges of the turf and causing a lip to form. If infield mix works its way into the turf during routine maintenance or the course of a game, take a broom and sweep all loose materials lying in the turf back onto the skinned surface. Then remove any grass that is swept onto the infield with a rake.

Another option to remove lips is to use a garden hose and high-pressure nozzle and spray the infield mix and conditioner out of the grass back onto the infield dirt. Spray at a 45-degree angle toward the infield while someone else helps to pull the loose material out of the grass, using a hard-tooth rake.

### 5. PREVENT RAINOUTS

Summer thunderstorms are a part of life for many regions of the US during tournament season. Unfortunately, that means a lot of rain can pour down on a field in a short amount of time and cause long delays or even cancellations if the proper preparations aren't made before tournament play begins.

Prevent infield puddles from forming by properly grading the infield, taking proper care when dragging the field, and fixing low spots if they form. Again, topdressing with a calcined clay helps soak up excess moisture from a rain event to ensure good footing and prevent delays.

Preventing slick, muddy spots from forming in the outfield grass is important too. Apply a topdressing of soil conditioner like at a rate of 500 pounds per 1,000 square feet to protect the turf in advance of rain. This will help absorb any future moisture on the field while also helping amend the soil long term.

If a storm has already passed through the area, it's not too late to prevent a major delay in play. To clean up puddles in the infield, specially designed drying agents like can be dumped onto the area and raked as needed to eliminate water and mud. In the outfield turf, apply a soil conditioner directly out of the bag into the puddle or muddy area. Allow it to absorb the water and rake the material into the turf and resume play.

Take the time to walk your field and look for any potential hazards before the start of tournament play. Making minor repairs and small improvements can have a huge impact on whether your tournament is fun, safe, and memorable for players and spectators alike. ■

*Swanson Russell represents Turface Athletics, which markets among other products Professional Mound Clay, MoundMaster Blocks, Turface MVP, Pro League, Pro League Heritage Red, Champion Brown, Field & Fairway, and Turface Quick Dry.*

# John Mascaro's Photo Quiz

Answers from page 15

John Mascaro is President of Turf-Tec International

**The reason why** this sports complex has snow cover on the field on top and not on the field on the bottom is actually not an easy question to answer. The 419 bermudagrass field on the right was overseeded with a specific perennial ryegrass/chewings fescue blend. The field was then topdressed with USGA sand. The remaining 11 fields of the baseball/softball/football complex were not overseeded or topdressed. In addition, all of the complex fields were constructed of the same materials. The sports turf manager thought it odd that the snow melted on the overseeded field some 2 hours earlier than the non overseeded fields. Due to the harsh winter in the Southeast, the turf color on the overseeded field did not come into play. I consulted with Dr. Tom Samples from the University of Tennessee and he suspects that the soil temperature of the overseeded bermudagrass field was higher than that of the dormant bermudagrass field alone (since the perennial ryegrass had probably been transpiring water from the soil before the snow, and the soil was drier). He also continued on that a second consideration would be the greater insulation value due to the increased stand density of the bermudagrass and perennial ryegrass mixture versus that of the dormant bermudagrass alone, causing the quicker snow melt on the overseeded field.

*Photo submitted by Bryan M. Farris, Parks & Recreation Supervisor at Ridley Park, Columbia, TN. Dr. Tom Samples, University of Tennessee in Knoxville, TN also contributed to the answer.*

If you would like to submit a photograph for John Mascaro's Photo Quiz please send it to John Mascaro, 1471 Capital Circle NW, Ste # 13, Tallahassee, FL 32303 call (850) 580-4026 or email to john@turf-tec.com. If your photograph is selected, you will receive full credit. All photos submitted will become property of SportsTurf magazine and the Sports Turf Managers Association.

Background illustration courtesy of istockphoto.com

# SALT SOURCES IN IRRIGATION WATER

**Nearly all waters contain trace levels of** salts, which dissolve into water as a result of mineral weathering in the earth's surface. In addition, water runoff from urban and agricultural lands during storm and irrigation events can also impact water quality. Salinity, or the presence of salts, within irrigation water can impact plant growth and soil structure. The salinity of water sources vary (Table 1) as do the influence of various trace elements that combine with salts to make up the total salinity or salt presence within your water source.

» **Storm surge related flooding could directly induce salinity problems** in land previously free of such issues via storm water runoff.

The total salinity of a water source is contributed by cations and anions. Common elements that contribute to salinity include calcium ($Ca^{2+}$), magnesium ($Mg^{2+}$), sodium ($Na^{+}$), potassium ($K^{+}$), chloride ($Cl^{-}$), bicarbonate ($HCO_3^-$), carbonate ($CO_3^{2-}$), sulfate ($SO_4^{2-}$), and others.

## NATURAL WEATHER PATTERNS

Salts are commonly found in coastal area soils and water bodies. Fluctuating tides influence fresh surface water sources and soils with shallow groundwater levels. Natural saline aquifers can also be close enough to the surface that it is very tricky to determine proper well depth. Further inland are deeper saline aquifers (commonly found out west) that are used alone, and or blended with fresher water for irrigation purposes.

Rainfall contains few salts, and is nature's way to remediate soil salt accumulation. Humid regions that are inland from the coast, receive plenty of rainfall and thus the soils do not experience any long-term salt accumulation. Arid climates, where evapotranspiration (ET) demand far exceeds rainfall, are another hot spot for salt issues. As water is lost from the soil via ET, the salts accumulate in the soil profile and near the soil surface.

Grasses that naturally grow in arid conditions or in coastal environments are adapted to living under moderate to high salt conditions. For example, bermudagrass, zoysiagrass, and buffalograss all have leaf glands that excrete excess salts.

▼ **Table 1.** Salinity values of various water sources reported for total dissolved salts in parts per thousand (ppt) and parts per million (ppm), and as electrical conductivity (EC) in uS/cm, and mS/cm.

| | ppt | ppm (mg/L) | µS/cm (µmhos/cm) | mS/cm (mmhos/cm, dS/m) |
|---|---|---|---|---|
| **Most freshwater streams** | < 1 | < 1000 | 100-2000 | 0.1 – 2.0 |
| **Distilled water** | | | 0.5 -3.0 | 0.0005 – 0.003 |
| **Water supply limit** | 0.5 | 500 | 782 | 0.782 |
| **US salt concentration limits in drinking water** | 1 | 1000 | 1560 | 1.56 |
| **Melted snow** | | | 2- 42 | 0.002 – 0.042 |
| **Typical limit for irrigation** | 2 | 2000 | 3130 | 3.13 |
| **Brackish: mild** | 1 - 5 | 1000 - 5000 | 1560 - 7810 | 1.56 – 7.81 |
| **Brackish: moderate** | 5 - 10 | 5000 - 10,000 | 7810 -15,600 | 7.81 – 15.6 |
| **Brackish: heavily** | 10 - 35 | 10,000 - 35,000 | 15,600 – 54,700 | 15.6 – 54.7 |
| **Sea water** | > 35 | > 35,000 | 55,000 | 55 |
| **Brine** | > 50 | > 50,000 | 78,100 | 78.1 |

Certain regions also experience the opposite of a salinity issue, in that some water sources do not have *enough* salts. Many inland regions of the U.S. have ground and surface water that is so low in salts that remedial actions are needed to alleviate the "salt-less" condition.

Hurricanes and extreme storm events also introduce salts into soil and aquifers. Storm surge related flooding could directly induce salinity problems in land previously free of such issues via storm water runoff. Saltwater intrusion into subsoil and groundwater aquifers can increase when storms produce differential hydrologic heads. Salt removal can occur naturally, aided by rainfall and leaching, but extended dry periods following such storm events often intensify negative salt effects on plants.

Seasonal weather patterns (dry summers) may also induce temporary salt issues. During this period, salts may accumulate in the soil profile if not properly irrigated to leach the salts. Fortunately, this is an issue only in extreme cases, due to the returning rains in fall.

## ANTHROPOGENIC SOURCES OF SALTS IN IRRIGATION WATER

Groundwater drawdown by urban and agricultural water use has contributed to saltwater intrusion into the underlying aquifer. Fresh water bodies that are influenced by tides are susceptible to saltwater intrusion occurring further upstream than normal as freshwater uses increase in urban areas. When this water is used for irrigation, it contributes to the salt levels in landscaped areas.

| Parameter (units) | # of samples analyzed | Range | Average |
|---|---|---|---|
| | ESSENTIAL NUTRIENTS | | |
| Nitrate-N (ppm) | 14 | 6.8 - 18 | 13.0 |
| Ortho-P (ppm) | 14 | 1.2 - 3.7 | 2.5 |
| Potassium (ppm) | 12 | 10.3 - 25.0 | 12.7 |
| Calcium (ppm) | 14 | 42.3 – 70.7 | 54.6 |
| Magnesium (ppm) | 12 | 3.5 – 4.0 | 3.8 |
| Sulfate (ppm) | 12 | 26 - 40 | 30.5 |
| Sodium (ppm) | 14 | 56 – 79 | 63.4 |
| Chloride (ppm) | 14 | 55.5 – 80.9 | 66.6 |
| | INDICATORS AND OTHER CONSTITUENTS | | |
| pH | 12 | 6.9 – 7.7 | 7.2 |
| TDS (ppm) | 12 | 384 - 467 | 418.8 |
| EC (mmhos cm-1) | 14 | 0.58 -0.73 | 0.65 |
| SAR | 12 | 1.9 – 3.1 | 2.3 |
| Bicarbonates (meq L-1) | 14 | 0.01 – 1.80 | 1.05 |
| Carbonates (meq L-1) | 14 | 0 – 0.33 | 0.05 |
| RSC (calculated) | 12 | 0.00007 - .008 | 0.005 |

▲ **Table 2.** Mineral values in reclaimed water (treated effluent) used for irrigation from the Myrtle Beach Wastewater Treatment Plant.

In the future, reclaimed water (treated effluent) from municipal wastewater treatment plants may become the prevalent irrigation source for turfgrasses and landscapes. Many golf courses already use treated effluent as a primary irrigation source. Large planned communities also use treated effluent to irrigate municipal parks and sports fields, commercial areas, and residential lawns. Examples include Tradition Hilton Head in South Carolina, which uses storm water as well as treated effluent for irrigating turfgrass areas. Treated effluent from the Michelson Water Reclamation Plant in Irvine, California is used to irrigate school playfields, athletic fields, parks and other turfgrass areas. Many ball fields, school yards, and parks in St. Petersburg, FL are irrigated with reclaimed water. Many other examples exist, yet treated effluent is not the most common water source for sports fields. This is primarily due to the lack of infrastructure to pipe treated wastewater to the end user. However, as freshwater demands increase, it is likely that treated effluent will become the MVP in the irrigation game.

One of the main issues with using treated effluent for irrigation is that disinfection residuals, typically chlorinators (e.g. chlorine gas and bleach (sodium hypochlorite)) may remain in treated solution. Low concentrations of chlorine and sodium can be problematic when used to irrigate plants. Emerging water treatment techniques use less of these disinfectants; however, the newer technologies require retrofitting or installation of new infrastructure, and thus are costly and will be implemented slowly. Although treated effluent may have a higher salt content, they typically also have a higher nutrient content, which can (and should) be considered into a facility's fertility program (Table 2). For example, treated effluent from the Myrtle Beach Waste Water Plant (Table 2) will most likely supply adequate levels of phosphorus, potassium, and calcium for maintaining highly managed turfgrass.

Although limited to those areas of the country that receive snow, it is noteworthy to comment on the salts contained in storm water runoff from roads deiced during winter storm events. The most commonly used deicers applied to roads are salt. Salts lower the melting point of water, causing the snow to melt in temperatures under which it would not typically melt. If the storm water runoff from our highway systems drains into a pond used for irrigation, the salts may concentrate over the winter making the water quite salty.

What does this all mean? Knowing your water source(s) is the first step to managing salts. In the next installment of this series, we will investigate what makes salts (or the lack of) such a problem for growing plants. ■

*Dara M. Park, Ph.D. is an assistant professor, turfgrass, soil & water quality at Clemson University. Dr. White is the nursery extension specialist at Clemson.*

Photo courtesy of GMB Architecture & Engineering, Holland, MI

# PRINCIPLES OF DRAINAGE: A BEGINNER COURSE

**UNDER NORMAL CIRCUMSTANCES**, the drainage for your synthetic field is invisible, at least to spectators and players. And that's the way it's supposed to be. The field should shed water and remain playable. After all, the only way drainage becomes noticeable is if it doesn't work.

Keeping the drainage working well starts with understanding it. And among all the decisions that can be made regarding a field, it's the drainage system that will be one of the most important to its success or failure as a facility.

Sounds dramatic, doesn't it? Consider this: it doesn't matter how great your scoreboard is, how nice the seating is or whether you have a press box if the field isn't draining well enough to be playable. Therefore, the investment in drainage on the front end of the project will allow all those other amenities to be appreciated and admired.

The biggest mistake many field owners make is cutting corners on drainage. Why? Because, to return to an earlier point, drainage is invisible. But how invisible is it really? When drainage isn't adequate to the amount of rainfall or watering the field gets, it means that water ultimately remains on the subgrade instead of moving away from the field. Over time, this can and will cause the subgrade to become unstable and allow the base to move. It may even allow water to back up through the base and onto the surface, washing out the infill or stretching the carpet.

And at that moment, the field owner won't be cherishing the money he or she saved by not installing adequate drainage.

To facilitate discussions with your drainage designer, you can estimate the amount of water your field will need to handle with the following formula:
**Length of the field in feet x width of the field in feet x .623 gallons = gallons of water produced by 1" of rainfall**

There are a number of options for drainage on the market. Ultimately, the system chosen will depend on several factors:

- the specific use or uses of the field
- the local climate
- the availability and cost of materials
- the quality and characteristics of local stone
- the financial resources and commitment of the owner
- time constraints for field construction, and
- the annual amount and intensity of rainfall, local codes and regulations regarding storm water management.

## FIND A GOOD PARTNER

If you find the array of options confusing, arrange for assistance. A design professional who understands field construction and who has worked with drainage for synthetic fields can understand the issues and help devise a plan that works in your situation. The professional will specify pipe diameters or the sizes of flat drains, location and distance of laterals, collection systems and storm sewer tie-ins for the drainage system.

To facilitate discussions with your drainage designer, you can estimate the amount of water your field will need to handle with the following formula:

Length of the field in feet x width of the field in feet x .623 gallons = gallons of water produced by 1" of rainfall

Note: Drainage products are rated by gallons of flow per hour.

There are various types of subsurface drainage systems used with fields. One type consists of flat drains, 6"-18" wide and 1"-2" thick, with or without a wrapping of filter fabric, placed horizontally on the subgrade in a diagonal, herringbone pattern.

Because synthetic turf fields drain quickly and have the potential to capture significant amounts of water, internal drainage lines usually can be placed farther apart (15' to 25') than for natural grass. However, the closer the lines are placed, the more quickly the field will drain. Closer drain line spacing will cost more.

The rate of drainage also will depend on the depth of the subgrade and the slope of the drains, usually .5% - 1%. The deeper the drains are placed, the slower the initial response time. Ideally a sports field, particularly synthetic turf, will be used only for sports; however, if you are aware that other activities will take place, and if these have the possibility of puncturing or damaging the turf, make sure the builder knows that the drainage system must be deep enough to protect it from potential damage.

Photo courtesy of Stantec Sport, Boston, MA

» **Stone and sand can function as a filter** to remove those particles and prevent them from entering the drainage system.

An alternate system uses perforated pipes, 4" - 10" in diameter, laid in a diagonal or herringbone pattern 10' – 30' apart. Pipes must be sized and spaced correctly by the design professional, depending on the amount of water they should be expected to handle. These perforated pipes are laid in trenches, surrounded by filter fabric and clean stone or coarse sand.

Whether using flat drains or traditional drainage pipes, water flowing into the drainage system can carry with it silt or clay particles or other contaminants. Therefore, it is important to surround the drainage pipes with clean stone (without silt or clay contamination) or coarse sand. Stone and sand can function as a filter to remove those particles and prevent them from entering the drainage system.


Photo courtesy of Medallion Athletic Products, Inc., Mooresville, NC


Photo courtesy of Lone Mountain Contracting, Inc., Bosque Farms, NM


Photo courtesy of Rettler Corporation, Stevens Point, WI


Photo courtesy of Rettler Corporation, Stevens Point, WI

Slope is another essential aspect of good drainage. Both flat drains and trench drains are sloped to the outside edges of a rectangular field. The drains should extend 10' – 15' beyond the sidelines themselves to an area where the water is deposited in perimeter collector pipes. Depending on the grading plan, the amount of water to be moved and other factors, intermediate collector pipes also may be included in the drainage plan. This is something your design professional can also decide.

Most baseball or softball fields include intermediate collector pipes starting approximately halfway up the sideline and running parallel to the centerline. It is also possible that football or soccer fields may include intermediate collector pipes depending upon the grade of the subbase, the amount of water expected, how quickly the field must be available after rain and other factors. These intermediate collector pipes as well as the drainage pipes move the water to perimeter collector pipes. From there, the water moves to a disposal site such as a storm drain or catch basin.

Most of the projects being designed today for synthetic turf consist of a "drainage layer" of stone (typically 6" to 8" deep) under the entire field to move water vertically as well as horizontally. Even without any piping, the slope of the subgrade and field will move water in a positive direction through the "drainage layer" of stone and along the designed slope. Perforated and sloped piping of any sort will make this more efficient and will move water more quickly to the established collection/exit points.

Though synthetic turf fields drain well, site drainage on areas adjacent to the field is still necessary in most cases. Where areas around the field naturally slope and drain toward the field or where existing pavement or structures such as bleachers drain onto the field, storm water can carry suspended silts and other solids onto the field impacting drainage and performance. Additionally, excess storm water draining onto the field may overtax its vertical drainage and impact play. Finally, synthetic turf fields will not drain vertically when frozen.

For all these reasons, it should be the goal of the drainage plan that the only water handled by the field drainage is from rain or direct irrigation. (In other words, the field should not be receiving runoff from the bleachers, dugout, track, any buildings or adjacent structures). Your design professional can provide information on site drainage, including interceptor drains, catch basins, retention ponds and the harvesting and dispersing of storm water. ■

*Mary Helen Sprecher is a free lance writer who wrote this article on behalf of the American Sports Builders Association. ASBA is a non-profit association helping designers, builders, owners, operators and users understand quality athletic field construction. ASBA offers the publication, "Sports Fields: A Construction and Maintenance Manual," which discusses, among other topics, sustainability in the construction and maintenance of synthetic fields, as well as synthetic turf recycling. For information, visit www.sportsbuilders.org.*

# Membership Application

SportsTurf MANAGERS ASSOCIATION

Experts on the Field, Partners in the Game.

*Fax to: (785) 843-2977*

*Or mail with payment to:*
*Sports Turf*
*Managers Association*
*P.O. Box 414029*
*Kansas City, MO 64141*

Name _____ Title _____

Employer/ Facility _____

❑ Business ❑ Home

Address _____

City _____ State _____ Zip _____

Home phone _____ Work _____ Cell _____

Fax _____ Email _____

Signature _____

Direct Supervisor Name _____

## New Members*

*As a new members, you receive a FREE conference registration, value $375, to be used within 3 years! Just indicate your status on the conference registration form.*

*Did someone refer you to STMA? We would like to thank them, and reward them with an STMA $100 voucher.*

Person who referred you:

_____

Facility name:

_____

*Not been an STMA national member since 2000. New student and affiliate memberships do not qualify for the free conference registration. However, all members are eligible to receive the $100 voucher for referring a new qulaifying member.

## Membership Category:

| | |
|---|---|
| ❑ Sports Turf Manager | $110 |
| ❑ Sports Turf Manager Associate* (Additional member(s) from the same facility) | $75 |
| Please select the primary facility type where you are employed: ❍ Professional Sports ❍ Higher Education ❍ Schools K-12 ❍ Parks and Recreation | |
| ❑ Academic | $95 |
| ❑ Student (verification of enrollment) | $25 |
| ❑ Commercial | $295 |
| ❑ Commercial Associate* (Additional member(s) from the same commercial company) | $75 |
| ❑ Affiliate (Person who is indirectly or on a part-time basis, involved in the maintenance/management of sports fields) | $50 |
| ❑ Retired | $50 |
| ❑ Chapter Dues (contact headquarters for amount) Chapter name) _____ | $_____ |
| ❑ Contribution To SAFE Foundation (research, education and scholarship): | $_____ |
| **Total Amount Enclosed:** | $_____ |

## Payment Method:

❑ Check ❑ Money Order ❑ Purchase Order #:_____

Credit Card: ❑ Mastercard ❑ Visa ❑ American Express ❑ Discover

Name on Card _____

Card #: _____ Exp. Date: _____

Signature: _____

*There must already be a national sports turf member from your facility or commercial member from your company before you may sign up in the Associate category.

**Phone: 800-323-3875** **www.STMA.org**

# Tools & Equipment

For more information on these and other products, please visit *www.greenmediaonline.com/productportal.*

## New mower from Masport

The Rotarola from Masport is a 21-inch aluminum deck mower with a rear roller specifically designed for mowing at lower heights and striping. Cutting range with this mower is ½" to 2¾" and the whole machine is set with a single handle height of cut adjustment lever. The solid rear roller leaves a crisp stripe behind for a dynamic finish. The Rotarola combines the quality cut and clean stripe of a reel mower with the ease of use and low maintenance of a rotary. It is powered by the Briggs and Stratton 850 Pro Series 190cc engine and features a rear collection bag, adjustable wheel bearings and an upturned and padded handle.

**Seago International**

## Companion fungicide has easier packaging

Companion is a very unique product formulated to fight a broad range of soil and leaf fungal disease. It has been called by leading researchers the most consistent and reliable biological on the market. Protecting the contents; packaging has always been an important part of our quality control, making sure that Companion gets to our customers in good condition, and remains so. Our NEW packing does just that and more! A new ROYAL Blue bottle protects the product from UV light, and the industry favorite design, an F-style handle, is easy to use and pour, making it the perfect packaging choice. The heavy HDPE material will survive the toughest handling and worst storage conditions. It's available in 4 different package sizes, so that it meets the needs of both smaller and larger users. And don't forget our larger 30 gal drum quantities for our larger end-user.

**Growth Products**

## New design for utility carts: OxCart

A next-generation utility cart designed to move heavy loads with a riding mower, OxCart is now available for turf professionals. Featuring an innovative, exclusive power-assist lift, OxCart reduces dumping effort by up to 90 percent. The only cart dynamically tested by an independent certified lab to three times the capacity of typical dumpcarts, OxCart offers durability, greater safety and dramatically increased ease of use. Other innovative features include: run-flat tractor-grade turf tires to move heavy loads rut-free; an offset dump pivot, eliminating harsh and abrupt dump release caused by heavy loads shifting; and a full mandrel bend steel axle support to provide high clearance and super strength to hold and move heavy loads

**OxCart**

## New approach to ejecting geese

Rather than resorting to drastic means to protect their playing fields and campuses, a growing number of athletic directors and groundskeepers are fighting back with an eco-friendly, EPA-approved goose repellent called FlightControl Plus. This spray-on solution is odorless, waterproof, and does not harm humans or vegetation. It uses an environmentally safe compound called anthranquinone formulated by Arkion Life Sciences. "FlightControl Plus continuously protects playing fields from geese because it gives geese a stomach ache, teaching them to avoid treated grassy areas the way you would avoid a restaurant that gave you a bad case of stomach upset," explains Joseph Tortola, founder of Northeast Ohio Geese Management. "The treated grass looks different to them so they avoid it on sight."

**Arkion Life Sciences**

## Netafim USA unveils new smart irrigation controllers

Developed exclusively for Netafim by Tucor, the Netafim Landscape Controllers (NLC) are powerful, multi-function landscape controllers expressly designed to maximize the water efficiency of any landscape, while reducing the time, labor and costs incurred when expanding a system into new areas of the landscape. Setting a new precedent for landscape water-use efficiency, the NLC controllers determine the unique watering needs of a specific landscape by incorporating both historical and current weather data as well as real-time data from soil moisture sensors that monitor the amount of moisture available to plants in each zone.

**Netafim**

## Replace mass with science in turf base system

UltraBaseSystems Champion is a patented STRUCTURALLY engineered sub base replacement system used for the installation of any synthetic turf. Our panel is designed to dramatically reduce the need for extensive site preparation both indoors and outdoors, creating a base structure capable of supporting enormous loads while greatly improving impact requirements. The results are a SAFER playing surface. High flow volumes both vertically and horizontally are achieved with UBS Champion creating a system capable of rapidly directing rainwater away from the turf and the players. Replace mass with science. Measuring 5.44 sq feet, the same area as the UBS Standard panel yet weighing 40% less, this .75 inch panel is built for strength and priced to impress.

**UltraBaseSystems**

## Turf Max introduces Pigment Remover

To help remove pigment stains and build up quickly and easily from spray equipment and keep equipment clean, Turf Screen introduces new Turf Max Pigment Remover. Using Turf Max Pigment Remover is as simple as applying it to the pigment stained equipment, waiting five minutes and pressure washing the mess away. The Pigment Remover is safe on almost all turf equipment surfaces, and will help return the equipment to like-new condition, even after the first application.

**Turf Max**

## Versatile hose reel for grounds maintenance

The compact, lightweight design of the Hannay Reels 1500 Series is specifically engineered for long lengths of hose used for a variety of applications including turf care, power washing, spraying, and wash down. This versatile reel features materials and finish that can stand up to corrosive fertilizers and pesticides to protect the reel and user. Keeps hoses organized and out of the way to prevent accidents; available in both manual and power rewind; can be truck-, trailer-, or garage-mounted on wheels, or carried by hand; equipped to handle 1/4-inch to 5/8-inch ID hose; chain and sprocket drive powered by electric, hydraulic or compressed air motor; standard inlet: 90 degree ball bearing swivel joint, 1/2-inch female NPT threads

**Hannay Reels**

Anuew™

## Nufarm's Anuew turf growth regulator

Nufarm launched Anuew turf growth regulator, a proprietary tool for cool- and warm-season turf management. The active ingredient in Anuew is prohexadione calcium, a new active ingredient with a novel mode of action. Anuew can be applied to all managed turf areas including sports fields and similar areas. Key reasons for use of a turf growth regulator like Anuew are to suppress vegetative growth and improve density and quality of desired turfgrasses.

According to a joint study by the University of Georgia, Clemson University and North Carolina State University, turf growth regulators may be used to manage annual bluegrass growth and development.

**Nufarm Americas**

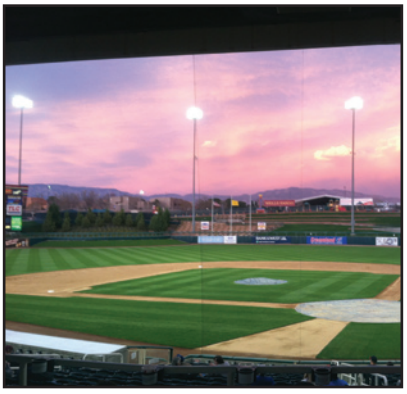
## Exmark 20-inch slicer seeder

The Exmark 20-inch Slicer Seeder performs verticutting, dethatching and overseeding with each pass. Durable high-carbon steel blades remove thatch and provide maximum seed-to-soil contact to enable superior germination. Productivity is maximized by the large-capacity 40-pound seed hopper, which allows the 20-inch Slicer Seeder to handle big jobs with fewer stops. The large-diameter mixer regulates seed flow based on ground speed to ensure even seed delivery. A Subaru EX 270 engine delivers reliable, quiet and fuel-efficient power, and emissions compliance, with EPA and CARB certifications. Infinitely variable hydrostatic drive and powered reverse make the Exmark 20-inch Slicer Seeder as easy to maneuver and operate as a self-propelled mower.

**Exmark**

# ISOTOPES PARK,

## Albuquerque, New Mexico



► **Category of Submission:** Professional Baseball
► **Sports Turf Manager:** Casey Griffin
► **Title:** Director of Field Operations
► **Education:** Oregon State University Bachelors of Science degree in Horticulture with emphasis in Turf Management
► **Experience:** My knowledge of the turf industry continues to expand. With a great enjoyment for the outdoors, my interest in turf began in 2003. I have built upon my experience by continually working in all aspects of turf maintenance. I worked a 3-month internship for the Eugene Emeralds and later wrote my thesis based on that experience. While attending OSU, I worked on their athletic grounds, primarily focusing on their baseball, softball and soccer facilities. Immediately after graduating in 2008, I came to Albuquerque and have worked my way from graduate intern to management to now director. Through these experiences, I have learned new maintenance practices and observed different management styles that have helped shape me into the professional leader I am today.
► **Full-time staff:** Gil South
► **Other staff:** Davin Sandia (intern), C.J Gershon (intern), Guy Feltman, Jeremy Lachman, Michael Gonzales, Robert Gonzales, Thomas Nelson, Travis Stanhope, Jeremy Sandia, Quinn Padilla, Kirk Allen, Braadley Vallez, Cody Hathaway & volunteer James Keefner.
► **Original construction:** 2003
► **Turfgrass variety:** Four Variety Kentucky Bluegrass Blend- 25% Bewtiched 25% Prosperity 25% P-105 25% Moonlight SLT
► **Drainage:** Herringbone
► **Renovation in 2012:** A complete re-sod of the field was preformed, as well as changing the existing grade of a ½% crown on the infield to a flat grade. The outfield was not "re-graded" although it was herigated and worked many directions. In addition, portions of the irrigation system were redesigned. Along with the removal of the game mound, approximately 2" (140 ton) of infield mix material was removed from the existing dirt playing surface.

Since being built in 2003, the bluegrass varieties began to colonize and *Poa annua* had taken over approximately 50-60% of the grass surface, which resulted in a weakening root system and undesirable aesthetics. This rectified poor playability and player safety that could no longer be overlooked. Due to heavily ramped grass edge to clay surface transitions, it became necessary to remove/drop our infield mix playing surface 2" in order to tie in our new short cut bluegrass sod to a seamless infield skin playing surface. The ½% crown on the infield was eliminated and laser graded to a flat surface to remediate the feeling of the pitchers throwing uphill. Although the rubber sat at 10" above home plate, the crown of the infield and numerous re-sods in front of the mound gave the perception that the rubber was in fact lower than regulation standards.

The sideline irrigation zone was split to allow for flexibility in watering times considering shade and sun issues that varied through the year. For example, in late fall and winter our first base sideline was often frozen over, or overwatered, in order for the 3rd base sideline to receive adequate moisture. An additional zone was also added to the infield irrigation system. Previously, there were four Hunter I 40 heads, one on each side of the infield, which resulted in poor distribution uniformity, excess overlap, and frequent puddling on skinned areas due to high spray volume. To remediate this issue, I replaced the four I-40's with four I-20's and added three I-20's to the new zone. This allowed for excellent distribution of water, while eliminating all overlap and puddling issues on skinned areas. Although the I-20's were more susceptible to drift, the amount of time spent hand watering the infield on windy days was minimal in comparison to time spent constantly repairing puddled up skin areas.

## WHY STMA SHOULD CONSIDER YOUR FIELD A WINNER?

There were a multitude of challenges we faced, and a series of triumphs we achieved this year. One of the many challenges was that of the field renovation. Renovations are clearly difficult regardless, but having the responsibility of overseeing a $250,000 project within the first month as Director was an extremely intense and rewarding opportunity. Additional projects we took on were the re-structuring of the bullpen mounds and home plate area, foul line re-surfacing, and instituting a knowledgeable approach for Poa management.

Paramount to the success of a nearly flawless field during the extreme spring and summer in New Mexico is the attentive care and hard work that was put in over the fall and winter. Example of this was our 9-11" root depth coming into the season. Weather posed un-predictable challenges as well. After enduring a college season that began in February in 25 degree weather, suffering through one of the worst droughts in history (3.37" total precipitation, April-August) we were dealt a monsoon season which at one point, delivered 89 mph winds and 41 % of our seasons rainfall in a 45-minute period, during a game. Through a schedule of roughly 100 game/on field events, we maintained a level of excellence that resulted in a Pacific Coast League Presidential Commendation award.

As sports turf managers, we all deal with constant challenges; however in this particular year with this particular set of circum-

stances I feel that our crew and our field performed at an extraordinary level. My staff went above and beyond the requirement for success as a sports turf management crew and our relentless dedication was exemplified by consistent playability, predictable performance of our playing surface, player safety and an aesthetically beautiful ballpark.

Moisture management is the key to the success of our field. In Albuquerque, this has to do to with the combination of wind, heat, and lack of precipitation. To maximize the effectiveness of our watering program, the use of wetting agents/pellets is vital. When hand watering turf areas, Aqua-Aid, a wetting agent pellet is attached to our 1" hose. We also use bagged clay and occasionally clay bricks as a backfill to high traffic area edges in order to help maintain the integrity of that edge.

**SportsTurf:** What channels of communication do you use to reach coaches, administrators, and users of your facility? Any tips for communicating well?

**Griffin:** Our preferred channel of communication is direct conversation; occasionally I will speak with our coaching staff via phone to keep one another informed as to mutual needs and wants. Generally speaking, we are talking with them (coaches/manager) daily. We have weekly meetings with our entire front office staff to ensure the lines of communications always remain open. Whenever we schedule outside events to take place on the field or at the stadium, we discuss specific guidelines pertaining to facility use in person and always present any restrictions up front to avoid confusion. It also allows us to prioritize field care as well as be flexible with what is required of us if necessary.

Tips on communicating well: early and often. Regular communication is mandatory to avoid potential surprises that could set you back. Pick and choose your battles, you have to remain flexible and keep the bigger picture in mind. Having a discussion about why you are reluctant to have something happen on your field might help you understand why it's necessary and allow you to adjust accordingly. It also helps the other party understand where you are coming from and how their event might adversely affect your field.

**ST:** What are your specific responsibilities?

**Griffin:** As Director of Field Operations I effectively oversee the playing surface at Isotopes Park. Included in that, are managing a staff of roughly 20 people during approximately 100 on field events (games, concerts, weddings, fundraisers, campouts, clinics, high school & college games and any other special events). The development and execution of a specified nutritional program for the grass based on annual soil and tissue testing that ensures a safe, consistent and aesthetically pleasing look, while taking into consideration an efficient and conservative moisture management program. Additionally, managing the care of our landscape, equipment maintenance and detailed recordkeeping of field maintenance, equipment, budget, and employees.

**ST:** How did you get your start in turf management? What was your first job?

**Griffin:** As a native of Oregon, I grew up around farms that ranged from blueberries to corn to Christmas trees. But what first drew my interest were all the grass seed farms. After competing in baseball, and working on golf courses, turf management became a keen interest. Once deciding to attend Oregon State and study the science behind turf grass, the writing was on the wall and there was no looking back, sports turf was it! While at school, I attained my first sport turf "job" and completed an internship with the Eugene Emeralds (short season San Diego Padres). This opportunity gave me great insight on how get a lot done with very little. It was a kick start to where I am now.

**ST:** What practices do you use to keep your infield skin in peak condition?

**Griffin:** I rely heavily on consistent cultural practices and developing the right combination of conditioners pertaining to the different type of seasons we have here in Albuquerque. Being that this is a high altitude desert, moisture management is extremely challenging. We have very low humidity index, little cloud cover, high temperatures and extreme winds. Spring time (March-May) brings on any given day, winds that gust from 20-50 mph, July-September is our monsoon season where we can get ½" -2" of rain in the matter of a minutes. Regardless of season, we want our infield skin to play consistent and to do that we must be consistent. During home stands, every morning we work our skin with a nail drag for a couple of hours, allowing our infield mix to tighten up. We strive for about 80-20 ratio with vitrified to calcined clay in the spring. The vitrified really hugs to our clay and allows us to retain our moisture through the winds, while the calcined clay helps reduce our compaction and gives us good protection by not penetrating our infield mix. In the summer (July-September) our rain season has arrived and we use more of a 50-50 ratio. A lot of this is preventative but by increasing our calcined clay content, we are helping absorb any potential rain that may come through. Both products work well together.

**ST:** What changes if any are you considering or implementing for the winning field in 2014?

**Griffin:** As far as changing anything for 2014, our goal is to continually strive to be the best we can be as a crew. You can never pay too much attention to the little things. No one has ever said that edge is too crisp or that line is too straight. Nutritionally speaking, we are in a constant state of research, growing and learning from knowledge shared through colleagues, reps and industry publications. Each year brings unique challenges and we just have to be prepared to adapt. That's the fun part of being in the turf industry.

**ST:** How do you see the Sports Turf Manager's job changing in the future?

**Griffin:** As the industry continues to grow and develop I would like to see corresponding employment opportunities become readily available for those who are qualified. I see the standard set for sports turf applicants being raised considerably. There are always the newest and greatest products being developed, but by no means do we need to reinvent the wheel. As much as new techniques are always being implemented, the turf manager position will always rely on the ability to get out on your grass and understand what it needs. ■

*STMA would like to thank Carolina Green, Ewing, Hunter Industries and World Class Athletic Surfaces for their continued support of the Field of the Year Awards Program.*

For more on the latest news, please visit *www.sportsturf.com* and *www.stma.org*.

# SAFE hires intern and expands educational outreach

**The Foundation for Safer Athletic** Fields for Everyone (The SAFE Foundation) has hired a summer intern. Kenzie Jay, who will be a senior in the fall in Strategic Communications at the University of Kansas, is focused on developing content for SAFE's website, SafeFields.org. She is interviewing previous scholarship and grant recipients to find out where they are today, promoting and soliciting for SAFE's annual fundraising events, and expanding its social media presence.

In addition, she will be working on SAFE's new educational videos that target volunteers, parents, coaches and youth athletes on how to maintain a field. SAFE's videos will be available at SafeFields.org in late summer

FIELD OF THE YEAR

# Awards Programs: Field of the Year & Innovative applications are ready

**Two of STMA's important awards** programs have updated applications online. Go to STMA.org and click on the Professionalism tab, then on each awards program.

Field of the Year recognizes those members who have managed their fields using ingenuity, solid maintenance and cultural programs, and environmental stewardship, while maximizing budget dollars and resources. Awards are given to fields for baseball, softball, soccer, football and sporting grounds at the schools/parks level, collegiate level and professional level. Winners are recognized with a plaque presented at the STMA Awards Banquet, signature clothing, and in an issue of *SportsTurf* magazine. Three complimentary hotel nights at the STMA conference are also provided to winners.

The Innovative Award program has been adjusted to provide more value to STMA's commercial members. For the 2015 awards program, which will be judged this year, commercial members have a 2-year time period in which to introduce a new product, service, or piece of equipment and apply for an Innovative Award. Previously, it was one year; it had to be introduced sometime following the current exhibition and shown at the next exhibition. The new, 2-year time period will allow those submitting the opportunity to apply two times for an innovative award with that same innovation. This will provide more time for the innovation to garner visibility, testimonials and real-world use.

President David Pinsonneault appointed a new task group, the Innovative Awards Task Group, to review previous procedures because no Innovative Awards were given this year. In addition to the expanded time period for introduction, the Task Group recommends that a separate committee of non-commercial members judge the program, rather than the Awards Committee, which is heavily involved in judging the Field of the Year and Minor League Baseball Sports Turf Manager of the Year. More media promotion of the winning innovation is also being planned in addition to its current recognition. STMA presents its winner(s) with an award during the trade show, signage at the trade show, recognition during the annual awards banquet, and authorizes the use of a special logo for the winning innovation.

The Task Group encourages commercial companies to submit for this program. It is very important to the judging process to include why the company believes their product, service or equipment is innovative, and explain how it is being used in the marketplace to substantially enhance the effectiveness of the sports turf manager and/or make the playing surface safer and more playable. The Task group gives a broad definition to the meaning of innovation: products, services or equipment that are cutting edge and have never been seen.

The Task Group is chaired by Rene Asprion, and its members include Steve Bush, CSFM, Ben Polimer, Chad Price, CSFM, CFB and Matt Tobin.

The applications for both the Field of the Year and the Innovative programs are due October 15.

# Standout students receive special one-time Watson Scholarship from Toro

**To celebrate its centennial (100** years in business) year, the Toro Company recently requested and received applications for a special one-time scholarship. Several standout students were awarded the scholarship. They are Andrew Wilhelm, Purdue University; Kevin Hansen, Iowa State University; and Chrissie Segars, Oklahoma State University.

The new Dr. James R. Watson Legacy Scholarship Program, funded by The Toro Giving Program, is a special one-time scholarship being given in celebration of The Toro Company's Centennial, which is in July. The scholarship honors long-time Toro agronomist Dr. James Watson who passed away Oct. 1, 2013.

Three $2,000 scholarships were awarded through the SAFE Foundation, STMA's charitable foundation, to deserving collegiate students who have at least one semester of education to complete before graduating. The scholarships were awarded to students who will attain a degree in sports turf management or comparable field of study from a two-year, four-year or graduate program.

In addition to the cash award, the students will receive an all-expenses-paid trip to the Toro Sports Fields and Grounds Forum, being held July 28-31, 2014 in Minneapolis.

# STMA recognizes its 5 & 10 year members

**Thank you** to STMA members who have reached the 5-year and 10-year milestones of membership. We salute you for your commitment to the profession! Through your support, you strengthen the industry, and you make possible STMA's continued development of resources and educational programs that are the foundation of the value of membership.

These members received their service pins in May.

## 5-YEAR

| | | |
|---|---|---|
| Adamski | Julie | |
| Altamuro | Ian | |
| Atkins | Jeremy | |
| Baldino | Ron | |
| Bardell | Tracy | |
| Barnes | Joshua | |
| Beggs | Andrew | |
| Bell | Kevin | |
| Bland | Justin | |
| Bonneau | Mark | |
| Breeden | Gregory | |
| Brown | Thomas | |
| Bryant | Aaron | |
| Buckner | Tab | |
| Burks | Brannon | |
| Byron | Bill | |
| Compau | James | |
| Cook | Daniel | |
| CroB | Dale | |
| CroseC | Ken | |
| Dan | Vlad | |
| Dickson | Kyley | |
| Eberhart | Shaun | |
| Eddington | Jock | |
| Emanuel | Jeff | |
| Fleming | Tim | |
| Gerth | Joshua | |
| Gianoli | John | |
| Gilbert | Jeff | |
| Gonzalez | Frankie Jr. | |
| Goyne | Thomas | |
| Grefrath | Phillip | |
| Hardy | Kevin | CSFM |
| Hooten | Mitchell | |
| Hopkins | Michael | |
| Horne | Logan | |
| Huelster | Gene | |
| Huffman | Rick | |
| Hunt | Joel | |
| Jacobson | Jerry | |
| Jennings | Dan | |
| Johnson | Andrew | |
| Johnson | Rob | |
| Johnson | ScoO | |
| Kirsch | Thomas | |
| Kline | Blaine | |
| Koester | Jason | CGCS |
| Kolander | Kelly | |
| Lansdowne | Jeff | |
| Lauer | Christopher | |
| LeBlanc | Robert | |
| Lock | Ryan | |
| Mardesich | John | |
| Mast | William | |
| McCaskill | David | |
| Merrell | Kenneth | |
| Mitchusson | MaOhew | |
| Moffat | Mark | |
| Morvay | Michael | |
| Mueller | Jason | |
| Mueller | Jason | |
| Nagelhout | Garald Jr. | |
| Peters | George | |
| Peters | James | |
| Peterson | Nephi | |
| Picha | Donald | |
| Pifer | Tom | |
| Powers | Bryant | |
| Reams | Chris | |
| Rolli | JoLynda | |
| Schader | Troy | |
| Schiller | MaOhew | |
| Schools | Brian | |
| Schoonmaker | Brink | |
| Shaw | Sean | |
| Simons | Zach | |
| Snide | Connor | |
| Soper | Michael | |
| Spacone | David | |
| Spier | Donald | |
| Steinman | Alexander | |
| Stokes | Brian | |
| Stokka | Dave | |
| SuOon | Ken | |
| Taylor | Kevin | CSFM |
| Thompson | David | |
| Tucker | Wayne | |
| Umeda | Kai | |
| Vandyne | Jim | |
| Watson | Stephen | |
| Wolsfeld | Bill | |

## 10-YEAR

| | | |
|---|---|---|
| Allgood | Dave | |
| Alterio | Chad | |
| Appelfeller | Weston | CSFM |
| Ashworth | Scott | |
| Avellino | Arthur | |
| Balough | Matt | |
| Bergdoll | James | CSFM |
| Betulius | Joe | |
| Boettcher | Michael | |
| Borgen | Cory | |
| Bossard | Andrew | |
| Boswell | Jack | |

| | | |
|---|---|---|
| Brazil | Joey | CSFM |
| Brosnan | James | Ph.D. |
| Byrnes | Dan | |
| Churchill | Joe | |
| Clark | Budgie | |
| Cochenour | Chad | |
| Cole | Nick | |
| Connors | Mike | |
| Conway | Devin | |
| Crider | Stephen | |
| Crowe | Jeffrey | |
| Daily | Darian | |
| Dufault | Randy | |
| Dunivan | Don | |
| England | Pete | |
| Fesler | Chris | |
| Finnerty | Mark | |
| Floyd | Weston | |
| Frew | Jason | |
| Gerhardt | Matt | |
| Giacalone | John | |
| Goatley | Michael | Ph.D. |
| Godin | Bruce | |
| Gorra | Carl | |
| Graves | Jon | |
| Hanson | Carl | |
| Harrison | J.K. | |
| Henn | Matt | |
| Henry | Michael | |
| Hill | J. Brian | |
| Hoag | Greg | |
| Hodgdon | James | |
| Hopkins | Rodney | |
| Hrivnak | Michael | CSFM |
| Hurlburt | Derek | |
| Jeffreys | Brad | |
| Johnson | Evan | |
| Johnson | Allen | CSFM |
| Jones | Alpha | |
| Krebs | Ray | |
| Kubacki | Mark | |
| Kubly | Bill | |
| Lamle | John | |
| Lovell | David | |
| Mackey | Brad | |
| Mahaney | Thomas | |
| Marseglia | Dan | |
| McGinty | Chris | |
| McKnight | Grant | |
| Mitchell | Dennis | |
| Patterson | Paul | |
| Patton | Mark | |
| Payne | Tony | |
| Pedroza | Sergio | |
| Purner | Dan | |
| Ramella | Aaron | |
| Sales | Travis | |
| Sallee | Mike | |
| Salmore | Nathan | |
| Sample | Robert | |
| Schneweis | Tracy | |
| Schroder | Eric | |
| Selsor | Kevin | |
| Shemesh | Daniel | |
| Sievers | Arthur | |
| Slaton | Kyle | CSFM |
| Smith | Michael | |
| Sommers | John | |
| Spoor | Robert | |
| Strickler | Robert | APRP |
| Sulak | Robert | |
| Takas | Nick | |
| Taylor | Alan | |
| Thorson | Wayne | |
| Thurn | Mary | |
| Trusty | Suz | |
| Turnour | John | |
| Van Drumpt | Peter | |
| Venegas | Gonzalo | |
| Viars | Jimmy | |
| Viars | Jimmy | |
| Walls | Rob | |
| Wear | Glenl | CSFM |
| Weaver | Christopher | |
| Wharton | Steve | |
| White | Bryan | |
| Wiggins | Jim | |
| Winter | Jim | |
| Wolfe | Lloyd S | |
| Wynn | Jeffery | |
| Young | Matt | |
| Zimmerman | Steve | |

## STMA Affiliated Chapters Contact Information

**Sports Turf Managers Association of Arizona:** www.azstma.org

**Colorado Sports Turf Managers Association:** www.cstma.org

**Florida #1 Chapter (South):** 305-235-5101 (Bruce Bates) or Tom Curran CTomSell@aol.com

**Florida #2 Chapter (North):** 850-580-4026, John Mascaro, john@turf-tec.com

**Florida #3 Chapter (Central):** 407-518-2347, Scott Grace, scott@sundome.org

**Gateway Chapter Sports Turf Managers Association:** www.gatewaystma.org.

**Georgia Sports Turf Managers Association:** www.gstma.org.

**Greater L.A. Basin Chapter of the Sports Turf Managers Association:** www.stmalabasin.com.

**Illinois Chapter STMA:** www.ILSTMA.org.

**Intermountain Chapter of the Sports Turf Managers Association:** http://imstma.blogspot.com/

**Indiana** - Contact Clayton Dame, Claytondame@hotmail.com or Brian Bornino, bornino@purdue.edu or Contact Joey Stevenson, jstevenson@indyindians.com

**Iowa Sports Turf Managers Association:** www.iowaturfgrass.org.

**Kentucky Sports Turf Managers Association:** www.kystma.org.

**Keystone Athletic Field Managers Org. (KAFMO/STMA):** www.kafmo.org.

**Michigan Sports Turf Managers Association (MiSTMA):** www.mistma.org.

**Minnesota Park and Sports Turf Managers Association:** www.mpstma.org

**MO-KAN Sports Turf Managers Association:** www.mokanstma.com.

**New England STMA (NESTMA):** www.nestma.org.

**Sports Field Managers Association of New Jersey:** www.sfmanj.org.

**Sports Turf Managers of New York:** www.stmony.org.

**North Carolina Chapter of STMA:** www.ncsportsturf.org.

**Northern California STMA:** www.norcalstma.org.

**Ohio Sports Turf Managers Association (OSTMA):** www.ostma.org.

**Oklahoma Chapter STMA:** 405-744-5729; Contact: Dr. Justin Moss okstma@gmail.com

**Oregon STMA Chapter:** www.oregonsportsturfmanagers.org oregonstma@gmail.com

**Ozarks STMA:** www.ozarksstma.org.

**Pacific Northwest Sports Turf Managers Association:** www.pnwstma.org.

**Southern California Chapter:** www.socalstma.com.

**South Carolina Chapter of STMA:** www.scstma.org.

**Tennessee Valley Sports Turf Managers Association (TVSTMA):** www.tvstma.com.

**Texas Sports Turf Managers Association:** www.txstma.org

**Virginia Sports Turf Managers Association:** www.vstma.org.

**Wisconsin Sports Turf Managers Association:** www.wstma.org.

## Chapter Sponsors

# JUNE 2014

## SportsTurf Magazine ADVERTISERS' INDEX

| Advertiser | Page # | Web Address |
|---|---|---|
| Aquatrols | 2 | www.aquatrols.com |
| Barenbrug USA | 52 | www.barusa.com |
| Beam Clay | 48 | www.beamclay.com |
| CoverSports USA | 13 | www.coversports.com |
| Eco Chemical | 29 | www.eco-templine.com |
| Ecolawn | 48 | www.ecolawnapplicator.com |
| Growth Products | 11 | www.growthproducts.com |
| Hydraway Drainage Systems | 15 | www.hydraway.net |
| Kochek | 48 | www.kochek.com |
| Sod Solutions | 33 | www.celebrationbermudagrass.com |
| Southern Athletic Fields | 41 | www.safdirt.com |
| SportsTurf Managers Association | 5 | www.stma.org |
| STEC Equipment, Inc. | 51 | www.stecequipment.com |
| SubAir Systems | 37 | www.subairsystems.com |
| Turf Sewing Machines | 48 | www.turfsewingmachines.com |
| TurfTime Equipment, LLC | 48 | www.TurfTimeEq.com |
| World Class Athletic Surfaces | 23 | www.worldclasspaints.com |

***Please complete this form in its entirety to receive your subscription.***

❑ **Yes, please start/continue my FREE subscription to *SportsTurf***

*FOR FASTER SERVICE visit our website at www.sportsturfonline.com/subscribest or fax to 845-856-5822*

❑ **No, thank you.**

**Which version would you like to receive?**

❑ **Print** ❑ **Print & Digital**

Signature: (required) Date:

Name: (please print)

Title:

Company:

Address:

City: State: Zip:

Phone: Fax:

Email: (required)

June 2014 - Expires October 2014 - RS1406

**1 What is your company's primary business?** (*check **ONLY ONE***)
F ❑ Sports Complex G ❑ Athletic Field and/or Park Architect/Designer
T ❑ School, College or University P ❑ Park
H ❑ Other (please specify)_____

**2 Which of the following best describes your title?** (*check **ONLY ONE***)
A ❑ EXECUTIVE/ADMINISTRATOR — President, Owner, Partner, Director, General Manager, Chairman of the Board, Purchasing Agent, Athletic Director
B ❑ MANAGER/SUPERINTENDENT — Superintendent, Landscape/Ground Maintenance Manager, Foreman, Supervisor
C ❑ GOVERNMENT OFFICIAL — Government Commissioner, Agent, Other Government Official
D ❑ SPECIALIST — Architect, Designer, Consultant, Agronomist, Horticulturist, Certified Specialist
F ❑ COACH
E ❑ Other (please specify)_____

**3 Do you have the authority to buy, specify or recommend products and/or services for your business or organization?**
Y ❑ Yes N ❑ No

**4 Yearly operating expenditures (excluding salaries)**
F ❑ Over $1 million C ❑ $50,001 - $100,000
E ❑ $500,001 - $1 million B ❑ $25,001 - $50,000
D ❑ $100,001 - $500,000 A ❑ $25,000 and under

**5 Please also send a free subscription to the following people at the same location**
Name _____Title_____
Name _____Title_____

# Q&A with Dr. David Minner

*Continued from page 50*

speed establishment. The strongest recommendation I can give you and the factor that will likely impact your success the most will be the seeding date. Construction projects are notorious for being delayed if you don't stay on top of the progress. Get the irrigation in as soon as possible even if it means seeding and watering some fields before others are completed. Set a seeding date of August 20 and hope for September 1. There is a huge difference between seeding the first of September compared to the end of September. Your target should be 100% turf cover by mid-October; more specifically no soil showing, two or more tillers on plants, and grass at a height that would require mowing. In my opinion you've got a fun project and a good plan; now make it happen. ■

# Q&A with Dr. David Minner

**Professor, Iowa State University**

**Questions?** Send them to David Minner at Iowa State University, 106 Horticulture Hall, Ames, IA 50011 or email *dminner@iastate.edu*.
Or, send your question to Grady Miller at North Carolina State University, Box 7620, Raleigh, NC 27695-7620, or *emailgrady_miller@ncsu.edu*.

# Advice on September seeding project

*I've been gathering information to renovate our 20-acre baseball, softball, and soccer complex in Wisconsin and I was looking for a second opinion on some of my thoughts and concerns. Work starts in mid-June with removal of tress, fences and installation of water, sewer, and power. We have an expected seeding date around 20 September, but I'm pushing to seed by Labor Day.*
*Ron Novinska, Oregon School District (WI)*

A second opinion is a great idea with the plethora of turfgrass information out there these days. It certainly can be confusing when you get two completely different answers to the same question. Many times an "expert" will have to generalize because the situation is not fully understood. Ron has done his homework and is now faced with making the best choice for his specific situation. Getting a second, third, and fourth opinion is a good idea because it brings out specific experiences that others have had, and the voice of experience is always a good thing.

*What is your thought on using a Kentucky bluegrass blend vs. a mixture of Kentucky bluegrass and perennial ryegrass on a bare ground seeding in September?*

Ron used the National Turfgrass Evaluation Program (NTEP) to evaluate the performance of local seed suppliers. He choose a Kentucky bluegrass blend containing Shannon, Midnight, Sombrero, Fullback, and Gaelic because three of the varieties were in the top 10 according to NTEP overall quality ranking; nice work, Ron. His specific question was, should these Kentucky bluegrass varieties be used alone or should they be mixed with 15% perennial ryegrass? It is a standard practice to mix perennial ryegrass and Kentucky bluegrass for many turf applications. The ryegrass germinates faster and that helps with grow-in, especially if the seeding date gets toward the end of September.

However, for higher end baseball fields I have stopped using ryegrass in the mixture because coaches are complaining about the ryegrass forming clumps and seed heads that are unattractive, difficult to mow, and make the ball bounce erratically. The ryegrass may never become a nuisance when fields are actively growing and adequately maintained with water, fertilizer, and mowing. But, I too have experienced unfavorable appearance and playing conditions when ryegrass clumps green up faster in the spring, or remain green and clumpy when fields dry. Then in May and June the ryegrass seed heads can completely evade reel mowing and often look stemy and objectionable even with rotary mowing.

We have overseeded ryegrass into compacted areas near dugouts, on deck circles, and outfielder areas, only to have the coach chastise us after the forbidden ryegrass turns ugly. So I have said goodbye to rye on my baseball fields because of coach's preference, and I agree with them on this one. Most of you don't like it when I make this comment but remember to a certain extent we are here to serve the coach and players, so openly listen to their opinion. If they don't mind the playing quality of ryegrass then it ain't broke and don't need fixing. The same case can be made for Ron's competition and practice soccer fields even though ball roll is not quite as important as it is in baseball. The density, low mowing, and playing quality of today's improved Kentucky bluegrass varieties do not need any assistance from perennial ryegrass. Overseed any worn or thin areas with more Kentucky bluegrass if needed during the first playing season. In a year or two if worn areas continue you can always turn to perennial ryegrass to help maintain 100% turf cover. Once you start adding perennial ryegrass to a field it will never leave or revert back to a monoculture of Kentucky bluegrass without killing everything and starting over. Don't get me wrong; perennial ryegrass is a very important grass for many sports turf situations, just realize what you are getting into; and for me, I am starting to consider ryegrass a weed in my bluegrass baseball fields.

Ron had more questions on how to ensure better establishment since Kentucky bluegrass establishes so slow and his practice soccer and softball outfields will be watered with a large, commercial traveling gun. *"The person overseeing the grow-in wants to use compost as a mulch for the seed. I was thinking of using a mulch like Encap and incorporating the compost into the topsoil instead. I don't know if the compost will hold moisture like mulch."*

Compost will increase water holding both within and on the surface of the soil, so it's a good choice to use well decomposed compost for your project. Even better is your decision to incorporate the compost into the surface 2 inches and then add the pelletized mulch over the surface to further speed establishment. The pelletized mulch is better than compost at sealing the surface and reducing evaporation. It also helps protect seedlings from being dislodged when the large water droplets from the rain train impact the surface. Your skills will be tested to devise a method of keeping the surface adequately moist and at the same time driving or walking on the surface to pull out the traveling gun. Keep the surface inch wet during the first 2 weeks to avoid delayed germination.

Regardless, the pelletized mulch should help you with both tasks. They also make fertilizer impregnated mulch that will help

*Continued on page 49*

Fraise Mowing & Turf Removal


Synthetic Cleaning System

Rotadairon Soil Renovator


Eco Dresser

Top Dressers & Material Handlers

Synthetic Turf Groomer


Synthetic Turf Aerator with Gentle Lifting Action

STEC
SPECIALIZED TURF EQUIPMENT COMPANY

1-888-325-2532
www.stecequipment.com

*Natural and Synthetic turf equipment for maintenance and renovation,*

*We are . . .*

**QUALITY. INNOVATION. DELIVERED.**

# SPORTS TURF SOLUTIONS

*Like No One Else*

## So Unique It Has a Name of Its Own

RPR® REGENERATING
*Perennial Ryegrass*

"We overseeded our bermudagrass baseball field with RPR and were very happy with it. It stayed green throughout the season and it played very well. It out-performed the traditional rye we have used in the past. In the spring the RPR survived unusually high temperatures and persisted until late spring."

Troy Farnsworth
Shadow Mountain High School in Phoenix AZ

## Bluegrass Engineered for Ultimate Performance

HGT® healthy grass TECHNOLOGY

"We here at Maryland SoccerPlex are HGT's biggest fans! Germination speed and seedling development made it possible for us to fully rebuild, seed, and re-open our stadium field in 35 days using HGT last fall. This year the wear tolerance and recovery have been equally impressive through 150 events in 200 days. Under stress from professional soccer, youth soccer, lacrosse and rugby, the HGT never really showed wear."

Jerad Minnick, Sports Field Manager, Maryland SoccerPlex

**Go to barusa.com for more information.**

BARENBRUG®
Great in Grass®
www.barusa.com