

# IMPORTANT THINGS IN LIFE: "MOORE" THAN GRASS

WINTER OVERSEEDING  
ATHLETIC FIELDS UPDATE

HERBICIDE RESISTANCE:  
A PROBLEM ON THE HORIZON?

IMPROVING BERMUDAGRASS  
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September 2013

# SportsTurf

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### On the cover:

Installation of drainage system around the perimeter of turf softball/baseball fields. Installation consists of the following: 20 mil plastic liner, 12 inch perforated pipe, and trench covered with  $\leq$  inch drainage stone. Photo courtesy of the American Sports Builders Association and Lone Mountain Contracting, Bosque Farms, NM.



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# From the Sidelines



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## Everyone gets paid but the players

**A**S I WRITE THIS NCAA (National Corrupt Athletic Association) executives, the top 15 of which split more than \$6 million in salaries annually while working in a \$35 million building, are probably on vacation but have sent a bumbling investigator to try and discover whether or not Texas A&M quarterback and Heisman Trophy winner Johnny “Football” (he’s trademarked it) Manziel was paid a few thousand for signing his own name to some merchandise.

In my opinion the status quo in big-time college football and basketball is not working. I no longer buy the argument against some kind of payment to players that their room and board and tuition and food and education are payment enough. That might have been true 25 years ago but not today; not when the average pay for head coaches at the big schools is more than \$1.5 million a year. Not when television networks, shoe companies, video game makers, and bookies are making billion dollar profits off the labor of, ahem, “student-athletes.”

Please don’t give me the “if we pay football players then we’ll have to pay wrestlers and volleyball players” line. As sportswriter Jason Whitlock put it, “This is America. We pay people who generate revenue. That’s capitalism. Wrestlers and volleyball players don’t generate revenue.”

The NCAA exploits athletes. Until very recently, you could go to their website and buy an Ohio State jersey with the number 5 on it, for example, and the NCAA claimed that was a generic Buckeye jersey, no significance and just a coincidence that it is the number QB1 Braxton Miller currently wears. Hey, you could be a big Chimdi Chekwa fan, right?

But when news surfaced that Miller, Manziel and other notable college players were signing their names on stuff, in possible violation of the NCAA’s (bad) rules, while simultaneously the association was profiting from the same jerseys, even the insanely inconsistent president Mark Emmert was embarrassed, and pulled the merchandise from his site.

The big-time schools aren’t blameless but rather shameless, moving from conference to conference in search of more money, shunting aside all tradition in search of bigger payouts. It’s only a matter of time when the remaining major conferences get even larger and then break away from the NCAA—and when they do they should recognize that today’s football and basketball players are basically full-time employees of their schools and deserve compensation.

Anyone think it’s fair that the athletes’ scholarships are 1-year renewable and an injury can potentially mean no scholarship? Not to mention no worker’s compensation for those injuries. Can you blame these guys for wanting a few bucks to or go on date or fly home to see their parents? The NCAA and the universities are making a lot of money from unpaid labor.

Of course the devil is in the details of setting up programs to pay players, and as Whitlock wrote, “this is America,” so shady side deals would be set up just as they are now despite the NCAA’s 400+ page rulebook. But the time has come to change the system; the noble principles that college presidents include in their statements on “amateurism” aren’t being matched by their actions. ■

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## Seasons, senses, and experiences

**S**EPTEMBER ARRIVES with a change of seasons from both the climatic and sports perspectives. If you live in an area that truly has a change in seasons, your senses of sight, sound, and smell are often reinvigorated in the fall. In the mountains of southwest Virginia, fall colors are typically vivid and one of the most popular bumper stickers sold at the campus bookstore during this beautiful time of year says, "If God isn't a Hokie, why do all the trees turn maroon and orange in the fall?"

Think about the feel of that first clear, crisp night of the season. What about that first smell of a wood-burning fireplace or the roars of a crowd as a touchdown is scored? Fall can result in sensory overload, but in a very positive way! Unfortunately, the overload too often faced by sports turf managers is associated with work as your schedules don't slow down much for a few more months. The agronomist in me reminds you of the importance of balancing heavy fall use schedules with the absolute musts of fall fertility, aeration, and overseeding. These steps are absolutely critical for success in both field safety and performance issues not only for the rest of this season, but for the 2014 season as well.

As always, this issue of *SportsTurf* is full of news you can use to improve yourself and your fields. There are important updates on STMA's new sourcebook and exciting new initiatives to expand membership and increase the numbers of first-time conference attendees. Also be sure to take a look at the updates regarding next January's conference and exhibition in San Antonio. Your Board and headquarters staff continues to tweak our conference programming and allied activities in order to make the conference both instructional and entertaining.

A change in seasons also brings a logical time for reflection on your job on the field and at home for the year to date. Jeff Salmond, CSFM, Director of Athletic Field Management, University of Oklahoma and the STMA Higher Education Board rep, has written an outstanding article reminding us of the importance of friends and family as he details the personal effects and responses to the devastating tornadoes of earlier this year in Oklahoma. Jeff's thoughts will help restore some perspective to our busy lives.

I close with a thought on experiences shared with me by a recently retired extension colleague, Dr. Wayne Wells. Wayne shared a true story that took place early in his career that he used to guide his professional and personal life. Two teachers were being recognized by their peers for having more than 40 years of service, but one person was deemed by most to clearly have had the most rewarding career. Why? It was observed that one teacher had 40 years of experiences, while the other had what would be better described as having one year of experience 40 times. Dr. Wells' point is simple: reward yourself and others by constantly seeking new experiences. Take care! ■

# Herbicide Resistance:

## A Problem on the Horizon for Athletic Field Managers?



► A DORMANT bermudagrass athletic field

**A**LTHOUGH CERTIFICATION PROGRAMS are in place to limit the presence of weeds in turfgrass seed and vegetative material (i.e., sod, sprigs, etc.), infestations are common on warm- and cool-season athletic fields. Weeds such as crabgrass (*Digitaria* spp.), goosegrass (*Eleusine indica*) and annual bluegrass (*Poa annua*) can be found on fields at all levels of play. Controlling these species is important to athletic field managers in that weed infestations can reduce both field quality and safety. Implementing sound agronomic practices and integrated pest management strategies can help discourage the presence of weeds on athletic fields. However, in many cases herbicide applications are often required for complete eradication.

### HERBICIDE RESISTANCE IS A PROBLEM

Herbicide resistance has been defined as the inherited ability of a plant to survive and reproduce following exposure to a dose of herbicide

normally lethal to the wild type (Vencill et al. 2012). The onset of herbicide resistant weed biotypes is a global problem of agriculture, turf included. Nearly 400 biotypes of herbicide resistant weeds have been reported worldwide, spanning over 200 different plant species (Heap 2013). The rate at which herbicide resistant weeds have developed in agricultural production has increased following the adoption of herbicide-tolerant crops (i.e., Roundup Ready). This technology allowed for herbicides targeting a single site of action (i.e., herbicides that work in a similar manner) to be repeatedly used for effective weed control; thus, reducing the diversity of techniques used for weed management (Vencill et al. 2012). As a result, selection pressure for herbicide resistant weed biotypes increased.

Despite the fact that herbicide resistance in crop production has been an issue since 1970, several reports of herbicide-resistant turfgrass weeds have surfaced in recent years, illustrating that herbicide resistance is an emerging problem of turfgrass weed management requiring intervention. While most of these cases of her-

▲ **GLYPHOSATE** resistant annual bluegrass (*Poa annua*) in dormant bermudagrass.

bicide resistance have occurred on golf courses, it is imperative that athletic field managers A) become aware of this emerging issue and B) make changes to their programs to prevent herbicide resistance from becoming widespread on athletic fields in the near future.

### WHAT CAUSED THE PROBLEM?

While herbicide tolerance traits (i.e., Roundup Ready) are not used in the turfgrass industry, diversity of weed management techniques is often lacking. Turfgrass managers often repeatedly apply the same herbicides for control of problematic weeds year-after-year. This has led to the development of herbicide resistant biotypes of annual bluegrass (*Poa annua*), goosegrass (*Eleusine indica*), and smooth crabgrass (*Digitaria ischaemum*) in turfgrass.

### GLYPHOSATE RESISTANCE

Bermudagrass (*Cynodon* spp.) athletic fields



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enter a period of dormancy during winter where growth ceases. Non-selective herbicides such as glyphosate (e.g., Roundup, etc.) that normally would be injurious to turfgrass can be used to control weeds during this dormancy period (Anonymous 2010). Many athletic field managers in the transition zone apply glyphosate for weed control during bermudagrass dormancy. Glyphosate applications to dormant bermudagrass fields often provide effective and more economical broad-spectrum weed control during winter conditions than other materials, particularly inhibitors of acetolactate synthase (ALS) such as foramsulfuron (e.g., Revolver), trifloxysulfuron (e.g., Monument), and flazasulfuron (e.g., Katana).

As a result, many weed populations on bermudagrass athletic fields are under intense glyphosate selection pressure, similar to that which has been reported following the advent of glyphosate-tolerant crops in agricultural production systems. Recently two biotypes of annual bluegrass with resistance to glyphosate have been reported in Missouri and Tennessee (Binkholder et al. 2011; Brosnan et al. 2012). In both cases, repeated applications of glyphosate were used to control annual weeds during periods of winter dormancy for over 10 consecutive years.

## RESISTANCE TO OTHER HERBICIDES

Resistance is an issue with herbicides other than glyphosate. ALS-inhibiting herbicides such as foramsulfuron (e.g., Revolver), trifloxysulfuron (e.g., Monument), and flazasulfuron (e.g., Katana) are commonly used on warm-season athletic fields to remove overseeded perennial ryegrass (*Lolium perenne*) and control other problematic grassy weeds such as annual bluegrass and goosegrass. Repeated use of these herbicides for annual bluegrass control has led to the development of annual bluegrass biotypes with resistance to ALS inhibiting herbicides. Cross et al. (2013) identified multiple biotypes of annual bluegrass in the southeastern United States resistant to foramsulfuron and trifloxysulfuron. Populations of annual bluegrass in Tennessee have recently been identified that are tolerant to 8x label rate applications of foramsulfuron and trifloxysulfuron.

Photosystem II (PSII)-inhibiting herbicides such as simazine (i.e., Princep) and amicarbazone (i.e., Xonerate) are used for annual bluegrass control in warm-season turf. Repeated use of these materials, particularly simazine, has led to populations of annual

bluegrass resistant to PSII-inhibiting herbicides in Alabama, Mississippi, North Carolina, Oregon, and Virginia (Heap 2013). Hutto et al. (2004) documented the presence of simazine-resistant annual bluegrass on 43% of the golf courses in Mississippi.

Dinitroaniline (DNA) herbicides such as pendimethalin (e.g., Pendulum) and prodiamine (e.g., Barricade) are regularly used for preemergence control of grassy weeds such as crabgrass, annual bluegrass, and goosegrass. Multiple biotypes of annual bluegrass and goosegrass resistant to the DNA herbicide prodiamine have been reported in the southeastern United States as the result of repeated use of prodiamine (Cutulle et al. 2009; Isgrigg et al. 2002; Lowe et al. 2001; McCullough et al. 2013; Mudge et al. 1984).

## WHY ANNUAL BLUEGRASS (POA ANNUA)?

To date, the majority of instances of herbicide resistance in turf have occurred in annual bluegrass. The reason for this phenomenon is not completely understood; however, herbicide resistance is most common in annual species (Heap 2013). Prolific annual bluegrass seed production may result in more rapid and effective dispersion and survival of herbicide resistant plants (McElroy et al. 2004). In agricultural production systems, many weed species developing herbicide resistance, such as Palmer amaranth (*Amaranthus palmeri*) and horseweed (*Conyza canadensis*), produce copious amounts of seed as well (Nandula et al. 2006; Norsworthy et al. 2008).

## WHAT CAN BE DONE?

In order to prevent herbicide resistance from becoming a problematic issue on athletic fields, turf managers must change their approach to weed control. The first step is to learn the manner in which different herbicides work to control weeds. Be sure to consult with local University Extension offices for more information on this important topic. Acquiring this knowledge will not only improve the professionalism of athletic field managers in general but it is also critical for developing weed control programs to prevent resistance development on warm- and cool-season athletic fields. Applying a rotation of different herbicides targeting varying sites of action (i.e., using products that work differently) will reduce selection pressure for herbicide-resistant weeds. However, it is critical that field managers rely on more than just herbicide applications to con-

trol weeds. Diversified weed management programs involving sound agronomic practices, integrated pest management strategies, and herbicide applications will ensure that herbicide resistance does not become a problem of athletic field turf in the future. ■

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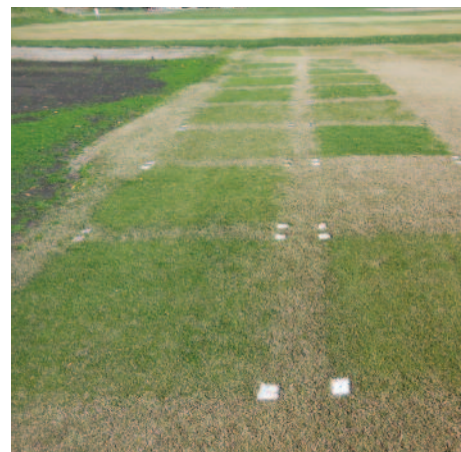
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► PURDUE UNIVERSITY'S Boilermaker soccer complex.



## Winter overseeding athletic fields update: 2013

▲ **Top: OVERSEEDING** is largely for cosmetic purposes but the cool-season grass also provides some wear tolerance and recovery.

▲ **Bottom: ANNUAL RYEGRASS**, left, compared to perennial ryegrass, right.

**B**ERMUDAGRASS provides one of the best playing field surfaces throughout many parts of the United States. When properly maintained it forms a uniform, dense, attractive and durable turf. Its strengths are that it readily tolerates close (< 1") cutting heights resulting in a "fast" surface players and coaches like. During the warmer months of summer it is a fast grower. This provides wear tolerance and rapid self-repair of divots from creeping rhizomes and stolons. This dense matrix of stems and roots also provides surface stability, good traction characteristics and an overall stable base for footing.

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Like all grasses, it is not perfect, and there are negatives. Being a warm-season grass, active growth slows as the days shorten in late-summer or mid-September. As the first hard frosts of autumn approach, bermudagrass begins to lose its vibrant green color and it slowly turns to a golden straw-brown color. In addition to this color loss, rapid growth stops resulting in decreased wear tolerance and less rapid recovery.

Probably one of the biggest weaknesses and one that limited wide-spread adoption in prior decades was the risk for severe winter-kill. Turf

managers were reluctant to use a grass that "might" need replanting each year. With the development of very winter hardy cultivars and the ability to rapidly establish bermudagrass from seed, it is now used in many areas where it once was never considered.

To offset some of the aforementioned negatives and to satisfy the public's desire for green grass "all the time," bermudagrass field managers often overseed with a cool-season grass. Overseeding is largely for cosmetic purposes but the cool-season grass also provides some wear tolerance and recovery in trafficked and heavily divoted areas. In recent years many different overseeding strategies and philosophies have emerged. The purpose of this article is to highlight and share some of these thoughts and considerations.

### WHAT TO PLANT?

Historically, the grass of choice for winter overseeding has been the ryegrasses. This group includes annual, perennial and "inter-

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▲ **OVERSEEDED** species competing with bermuda during spring transition.



▲ **UP-CLOSE VIEW** of a ryegrass seed germinating.

mediate” ryegrasses. The ryegrasses have a large seed size, with significant endosperm (food reserves), which helps them germinate fast and mature quickly when planted under ideal conditions. Generally, most managers select and plant good quality perennial ryegrasses for winter overseeding, especially where they plan to chemically remove the overseeding. There are, however, alternatives that can be considered.

Annual ryegrass is one of the options among the ryegrasses and appears to be attractive from a price point, 25-40% less than a high quality perennial ryegrass. Most annual ryegrasses tend to form a lower quality turf than the perennial ryegrasses, even when well established. Many people do not like the light-green/yellow-green color and the turf may be prone to becoming “stemmy” with poor mowing quality/leaf shredding. Lastly, annual ryegrass is sensitive to harsh winter conditions and will die quickly with the onset of summer heat, making it somewhat unreliable. Although breeders continue to improve and advance this grass, it may best be left for use in places where appearance is not paramount like utility lawns.

Some researchers have been evaluating the tetraploid ryegrasses for overseeding with some success. These ryegrasses are sometimes referred to as “intermediate” ryegrasses and have turf quality characteristics similar to the perennial ryegrasses but their heat tolerance is not very good, somewhat similar to an annual ryegrass. This lack of heat tolerance helps as the turf stand transitions back to bermudagrass during late-spring without the need for chemical transitioning.

What about other species and options? Turf breeders continue to advance all species with the help of feedback from turf managers and desirable characteristics. In some parts of the country I have heard of managers exploring the incorporation of Kentucky bluegrass into their bermudagrass. The goal I am told, is to create a polystand of warm and cool-season spreading, self-repairing grasses that would ebb and flow throughout the growing season. This mixture of bermudagrass and bluegrass might allow for greater intense use across all seasons, spring, summer, autumn, while providing moderate green color all season without a need to overseed/interseed. This technique has not been well evaluated in research trials and it is possible that over a period of years the turf could become very patchy due to segregation. This approach may have some merit where appearance is not paramount and is not a suggested option for stadium fields.

The turf-type tall fescues are another

species that has not been well explored, particularly the very narrow leaved ones. The seed size of tall fescue is similar to perennial ryegrass and germination, emergence and establishment is about the same, but ever so slightly slower. Further, with some of the new turf-type tall fescues the visual (color/density) and mowing characteristics are similar to perennial ryegrass or a Kentucky bluegrass. One advantage to using tall fescue is it is not quite as susceptible to gray leaf spot compared to perennial ryegrass. Tall fescue does, however, have very good heat and drought tolerance and would need to be chemically removed the following spring.

The final point I should make is to remember, like anything, you get what you pay for! Purchasing a higher quality ryegrass that germinates quickly and has good turf characteristics (color, leaf texture, density) would in most circumstances be preferred over a less expensive species that has poor seed quality. These less expensive, lower quality seed lots tend to have a greater potential for annual bluegrass (*Poa annua* L.) contamination and that introduces a whole group of other future problems.

**HOW MUCH SEED?**

If you look up published seeding rates for any grass species the values are normally based on the assumption that you will be seeding on bare soil with the intended purpose of an ornamental lawn, etc. As we all know athletic

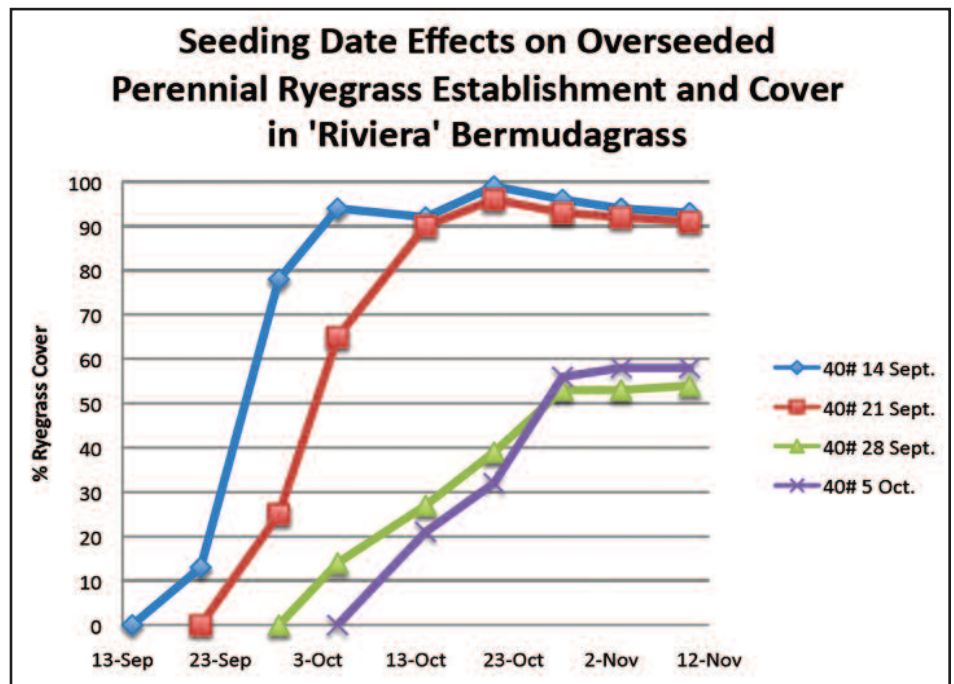


Figure 1

fields serve a very different purpose than an ornamental lawn. The sometimes intense traffic, particularly in concentrated areas like between the hashes, sidelines, goal mouths, and field entry/exit points along with the mechanical forces involved in close mowing and foot traffic, can be a harsh environment for a turfgrass seedling to develop and survive. As one of my colleagues has said, the adage “more is better” bears some truth when it comes to winter overseeding, and I agree.

For athletic field overseeding, it is recommended that the seeding rates be double or many times more than normal, simply because a great deal of seedling mortality is expected. For example, a common seeding rate for perennial ryegrass on bare ground is about 5 pounds of seed per 1000 ft<sup>2</sup> or 220 pounds per acre. For general overseeding purposes a rate of 2 to 4 times as much or 400 to 800 pounds per acre is not uncommon. Without these higher seeding rates you risk producing an overseeded turf that may have a patchy appearance. This can be worse than not overseeding at all.

For overseeding on American football fields used at the collegiate and professional level it is not uncommon to use extremely high rates, doubling those aforementioned rates to 1500-1600 pounds per acre. Some of our research at Purdue on winter overseeding indicated that these very high rates, 40-50 pounds per 1000 ft<sup>2</sup> or 1600 pounds per acre, appear necessary if the goal is to produce a dense, closely mowed turf that will persist. Remember, these fields are subject to very intense traffic compared to soccer, etc. The athletes at this level are larger, more aggressive in the way they move on the field, and basically there is much more potential for large divots. Compounding the overseeding challenge for us in north central Indiana is that we have a very short window to achieve good establishment. Thus, the strategy is seed heavier early, then top off the stand throughout the season. Remember, if these very high seeding rates are used you will most certainly be considering chemical removal if you want the bermudagrass turf to fill back in quickly the following spring.

The other consideration is that if you are using these extremely high seeding rates it is important to regularly scout for disease. If an “Indian summer” persists resulting in prolonged late-summer heat and humidity these seedling diseases will be more of a concern. Loss during late-season establishment can re-

ally set back any overseeding program. You should have appropriate plant protectants available for either preventative or curative control. It is also important to at least be aware and scouting for potential seedling mortality from gray leaf spot. This disease is a very real concern wherever ryegrass is planted and can be particularly devastating to seedling ryegrass. The symptoms are very similar to drought stressed turf, so keep a watchful eye.

### WHEN TO PLANT?

The ideal time to plant cool-season grasses for optimum germination and the fastest establishment is late-summer through early to mid-fall. The most important factors affecting overseeding success are sustained soil temperatures and seed-soil contact. Rather than put a hard and fast planting date on overseeding, some published guidelines suggest monitoring air and soil temperatures. For example, some books suggest initiating overseeding when night-time temperatures are consistently around 50F or soil temperatures at 4 inches are in the mid 70'sF. These are good guidelines and in many cases it is probably better to be slightly

early than too late when initiating overseeding.

A suggested planting date or monitoring soil temperatures can be a bit of a moving target and sometimes as a field manager you are stuck with a seeding window dictated by field use schedules. If you have a choice, starting earlier is highly suggested and then topping off throughout the rest of the season. This is particularly true if you are pushing the northern edge of growing bermudagrass in the transition zone. One thing I have learned is that the farther north you are, it is amazing how quickly the soil temperatures can drop and limit establishment success. We have been evaluating perennial ryegrass overseeding dates and it continues to surprise me how much of a difference even a few weeks makes once you get into late-September in West Lafayette. It is essentially the difference between achieving roughly 90% ryegrass versus 60% when planted the last week of September or the first week of October, even at a very high seeding rate, 40 pounds of seed per 1000 ft<sup>2</sup> (Figure 1).

*Continued on page 44*

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# Improving bermudagrass fall traffic tolerance and spring recovery through fall fertilization

**B**ERMUDAGRASS is considered one of the most desired turfgrass species for athletic field use in the United States. Bermudagrass's aggressive growth habit of stolons and rhizomes offers stability and traffic tolerance to maximize player performance with the ability to recuperate from wear stress. Mostly grown in the southern half of the United States, bermudagrass growth north of the transition zone is limited by cold winters. However, with improved cold tolerant cultivars, bermudagrass management in the transition zone and north is becoming more common. When grown in colder climates the bermudagrass enters dormancy sooner,

meaning that if a green turf is desired, the field must be overseeded with ryegrass.

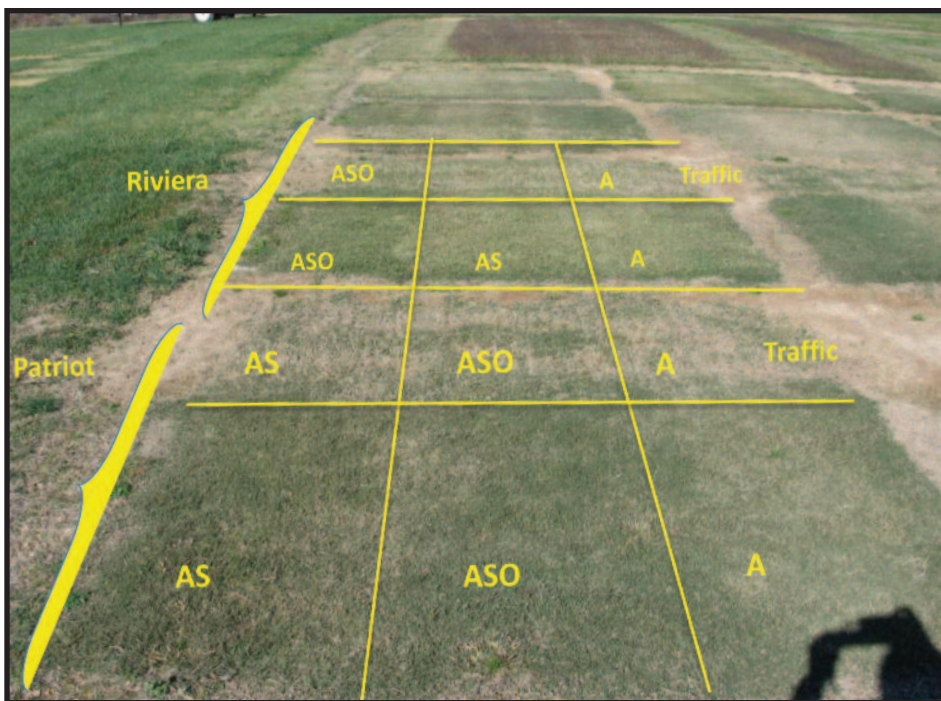
Bermudagrass traffic tolerance and outstanding recuperative ability during its active growing periods have allowed bermudagrass athletic fields to become multi-sport facilities. The intensive use of these fields increases the importance of proper cultural practices such as irrigation, cultivation, pest management, and fertilization to obtain maximum bermudagrass performance. Nitrogen (N) fertilization is especially important in order to optimize bermudagrass growth. A typical bermudagrass fertilization program includes N applications up to one pound of soluble N per 1000 square feet per active growing

month. Research has shown this amount of N can supply bermudagrass with adequate nutrients without losing valuable resources to the environment during these active growing periods. But what about fall N fertilization applied outside the optimal windows of application to bermudagrass? Can it improve fall traffic tolerance and spring recovery of bermudagrass athletic fields?

Research has shown this amount of N can supply bermudagrass with adequate nutrients without losing valuable resources to the environment during these active growing periods.

## RESEARCH METHODS

The research was initiated in June 2010 at Virginia Tech's Turfgrass Research Center using plots established by sprigging Patriot, Riviera, and Wayland bermudagrass. Patriot and Riviera are both commercially available cultivars, while Wayland is an experimental ecotype selected at Virginia Tech for its rapid spring green-up and spring dead spot tolerance. The research has continued into 2013. Irrigation was applied to promote active growth; the plots were mowed three times weekly at 1.25 inches, and N (urea, 46-0-0) was applied at 1 lb N/1000ft<sup>2</sup> per month on the first day of June, July, and August. The fall fertilization treatments extended N applications into September and October resulting in a possible total of 5 lbs N/1000 sq ft for the season (October fertilization treatments are split into two ½ lb N/1000 sq ft applications on 2 week intervals in case a killing frost event might negate an application). Beginning on approximately August 30 of



▲ PICTURE TAKEN OCTOBER 29, 2010. Two months after traffic initiation and one month after last fertility application.



# JOHN MASCARO'S PHOTO QUIZ

John Mascaro is President of Turf-Tec International

Can you identify this sports turf problem?

- Problem:** Brown "X" shaped area
- Turfgrass area:** Football practice fields
- Location:** Cincinnati, OH
- Grass Variety:** Patriot bermudagrass overseeded with ryegrass

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



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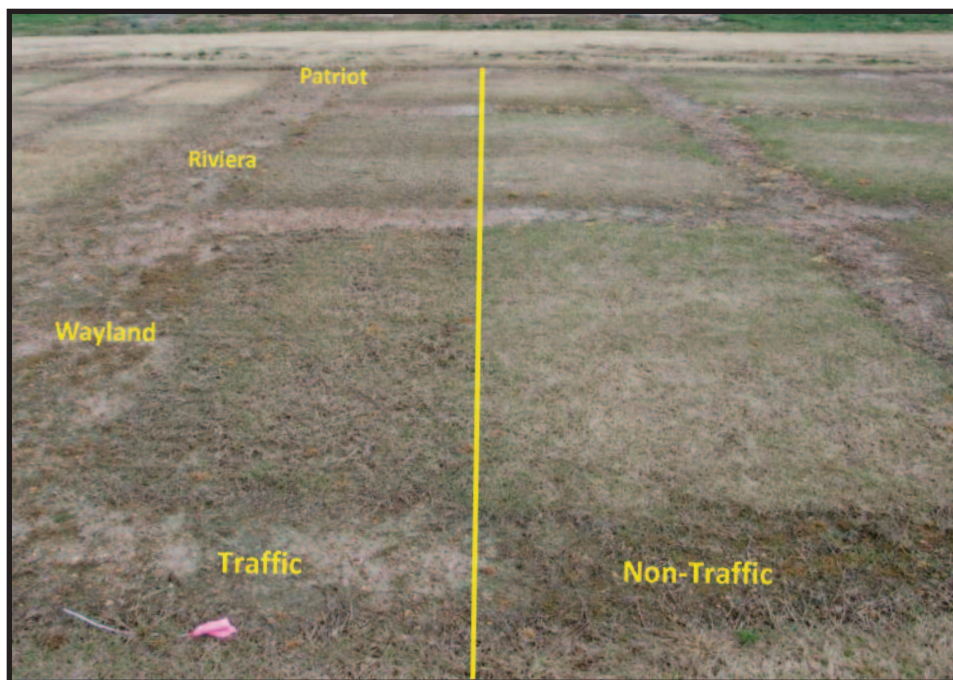
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	% turfgrass cover							
	-----18 Oct. 2010-----				-----1 Nov. 2010-----			
	A	AS	ASO	LSD	A	AS	ASO	LSD
Traffic	67.1b *	73.0a *	75.4a *	2.9	70.8b *	77.5a *	77.5a *	2.9
No Traffic	100	100	100	-	100	100	100	-
Means within the same row and measurement date followed by the same letter are not significantly different at p = 0.05.								
Means within the same column and measurement date separated by a * are significantly different at p = 0.05.								

▲ **Table 1: VISUAL PERCENT TURFGRASS COVER RATINGS** of three bermudagrasses as influenced by traffic and fall N fertilization programs (Aug (A), Aug+Sept (AS), or Aug+Sept+Oct (ASO)) in their establishment year.

	% bare ground							
	-----12 April 2011-----							
	'Wayland'	'Riviera'	'Patriot'	LSD	A	AS	ASO	LSD
Traffic	34.2a *	31.3a *	20.8b *	6.7	34.2a *	25.8b *	26.3b *	6.7
No Traffic	0	0	0	-	0	0	0	-
Means within the same row and measurement variable followed by the same letter are not significantly different at p = 0.05.								
Means within the same column and measurement variable separated by a * are significantly different at p = 0.05.								

▲ **Table 2: VISUAL PERCENT BARE GROUND RATINGS** of trafficked and non-trafficked bermudagrasses ('Wayland', 'Riviera', and 'Patriot') prior to spring greening as influenced by fall N fertilization programs (Aug (A), Aug+Sept (AS), or Aug+Sept+Oct (ASO)) or cultivar in their establishment year.



▲ **PICTURE TAKEN APRIL 12, 2011** during spring green-up illustrating the percent bare ground of the trafficked plots as compared to the non-trafficked plots. 'Patriot' had less bare ground than the other two cultivars.

each year, simulated traffic was applied at a level of six events per week using a Brinkman traffic simulator, with traffic ending during the first week of November in order to simulate a typical fall high school football schedule.

The lower bare ground ratings of fall fertilization will also lead to faster spring green-up and recovery, allowing for a longer active growth period to increase traffic tolerance for the upcoming sports season.

## RESULTS

Establishment year data will be emphasized for this report. Rate of establishment was monitored by tracking visual percent turfgrass cover throughout the weeks following establishment. Two weeks after planting in June 2010, Patriot achieved 50% coverage whereas the other two cultivars had not reached 40% coverage. All grasses reached 95% or greater turfgrass cover by August 6, with Patriot covering the quickest, followed by Riviera and Wayland. The establishment rate of Patriot gives it an advantage over the other two cultivars because Patriot will have time to form a dense canopy to better withstand the fall traffic. This was shown to be true by percent turfgrass cover ratings taken on October 18, 6 weeks after initial traffic treatment. Percent turf cover of trafficked plots was significantly higher in Patriot than Riviera which was significantly higher than Wayland. Compared to the 100% covered non-trafficked plots, trafficked Patriot had 75.8%, Riviera had 72.5%, and Wayland had 67.1% coverage. Patriot tolerated more traffic in its first growing season, suggesting it would be the premier choice for high-use fields during the first football season. The greater traffic tolerance of Patriot compared to the other grasses is further supported by visual percent bare ground ratings prior to spring green-up. Data taken April 12 show Patriot to have significantly less bare ground than Riviera and Wayland which both had greater than 30% bare ground. Even though Patriot has less bare ground in early spring, Wayland and Riviera greened

up faster throughout spring until late spring where there were no differences.

The fall fertilization treatments did not yield the same distinct treatment differences as reported for the various cultivars shown. Table 1 shows visual percent turf cover of the three cultivars influenced by traffic and fall nitrogen fertilization programs. Percent turfgrass cover of trafficked September-ending and October-ending fertilization plots was similar on ratings taken 6 and 8 weeks after initial traffic treatment. However, on both the rating dates, the extended fertilization showed significantly higher percent coverage than the August-ending fertilization. These findings suggest applying fall N will increase fall traffic tolerance. Spring turf density was also increased from fall nitrogen applications due to the significantly lower bare ground percentages in early spring. Both September and October-ending fertilization events decreased to below 27% bare ground, whereas the August-ending fertility treatment had greater than 34% bare ground (Table 2).

The lower bare ground ratings of fall fertilization will also lead to faster spring green-up and recovery, allowing for a longer active growth period to increase traffic tolerance for the upcoming sports season. Extended fertilization provided benefits that persisted beyond the current season.

As the research has continued on what are now well-established plots, the degree of treatment responses from the fall fertilization is somewhat less as compared to the establishment year. There are still recorded differences in turf density in the fall and spring rating periods, but the genetic differences in the cultivars result in differing greening and growth rates exceeds the treatment responses due to the fall fertilization. We recommend that transition zone managers strive to keep bermudagrass actively growing as long as they can in the late growing season, but that they use lower levels and split applications of N so that the nutrient is used efficiently and there is little potential for nutrient leaching or runoff.

Establishment and overall growth rates/traffic tolerance are ranked Patriot > Riviera > Wayland. Extending N fertilization treatments into September and October increased fall percent turfgrass cover in

trafficked plots for all cultivars, decreased early spring bare ground ratings, and accelerated spring greening. While all three cultivars tend to have better fall and spring turf coverage ratings from extended fall fertilization, the differences in traffic tolerance seem to be more related to differences in inherent growth rates and turf density than fertilization treatments as the plots mature. ■

*Eric H. Reasor is a graduate research assistant, Department of Plant Sciences, University of Tennessee-Knoxville. Dr. Michael Goatley is a professor and turfgrass extension specialist, Department of Crop and Soil Environmental Sciences, Virginia Tech, and President of the Sports Turf Managers Association.*



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# WHEN FUNGI ATTACK

**Y**OU, MY GOOD MAN OR WOMAN, are on a roll. It's August 1 and your fields are pristine. The players don't make a single negative comment about its condition, and even better the boss gives you that rare compliment for how it both looks and plays. It's time for a celebratory beer(s). Now it's August 2, and you notice a small brown patch the size of a softball near midfield. No big deal, it's probably just a tad dry, and you increase the irrigation a bit to compensate. You take the weekend off, come back on August 5, and you have most certainly fallen off that roll. Not only has the one patch expanded to the size of a basketball despite increased irrigation, but new patches seem to be popping up all over the place. You make sure to get a fungicide application down that day, but a week later your prized field went from pristine to the surface of the moon. Instead of compliments from the athletes and your boss the athletes are turning ankles and you're receiving stern warnings. What the heck happened?

▼ **Figure 1:**  
**GRAY SNOW MOLD** following snow melt in the spring can seriously hamper spring sports activities in temperate climates.



Maintaining athletic fields under today's demands with today's budgets can seem daunting, and usually one of the last things on a manager's mind is the possibility of disease. While diseases of athletic fields don't require the same intense preventative techniques as those found on golf courses, there are a few that can be serious if you aren't paying attention. Since everything is better in list form; here are my top 5 diseases of athletic fields (cool-season turf edition):

**5. SNOW MOLD** This disease (*Typhula incarnata*, *T. ishikariensis*, *Microdochium nivale*) is higher up the list for those in harsher winter climates, and not even close to the list in many climates. Snow mold is actually an umbrella term referring to three distinct diseases: gray snow mold (*T. incarnate*), speckled snow mold (*T. ishikariensis*), and pink snow mold/*Microdochium patch* (*M. nivale*). Snow molds rarely kill turf, but can leave significant damage following snowmelt that can severely impact the playability of a field in the early spring (Figure 1). Snow mold can be minimized by avoiding late fall fertilizations heavy in fast-release nitrogen. However, if avoiding late fall fertilization is not practical or the snow cover in the winter routinely persists for 2 or more consecutive months, a preventative fungicide application may be warranted. Many fungicides will provide effective snow mold control when applied preventatively; including but not limited to most members of the strobilurin and demethylation inhibitor (DMI) class of fungicides (Table 1).

**4. RUST** Though reports of aggressive rust (*Puccinia* spp) (Figure 2) are becoming more prevalent in certain parts of the country, this disease remains a relatively minor disease for most athletic field managers (except if a team's white uniform is orange after the game [Figure 3]!). Rust is most severe on

Fungicide Class	Active ingredient	Common trade names <sup>2</sup>
Strobilurin (Qol)	Azoxystrobin Pyraclostrobin Trifloxystrobin	Heritage Insignia, Insignia SC Compass
DMI	Metconazole Myclobutanil Propiconazole Tebuconazole Triadimefon Triticonazole	Tourney Eagle Banner MAXX, Propiconazole Pro, Spectator, Savvi Torque Bayleton Trinity, Triton FLO

<sup>2</sup>List of trade names was taken from the University of Kentucky's Chemical Control of Turfgrass Diseases 2013 and is not an endorsement of any particular product.



Figure 2



Figure 3

◀ **Table 1: LIST OF COMMON TURFGRASS FUNGICIDES** in the strobilurin (sometimes called Qol) and demethylation inhibitor (DMI) classes.

▼ **Left Figure 2: RUST** is an easy disease to identify (look for the orange pustules), but can be a hard disease to control when money is tight.

▼ **Right Figure 3: A NON-CHEMICAL** rust solution is to make sure the home team only wears orange uniforms.

slow-growing or stressed turf during July, August, and September though it can appear earlier than that in southern locales. Turf growing on heavily compacted soil, which can be common on heavily trafficked fields, is especially at risk for developing rust. The same goes for fields that are under-fertilized or poorly irrigated. If rust appears on your field, immediately fertilize with a water-soluble nitrogen source and water in to encourage turf growth. For long term prevention of rust, be sure to regularly aerify high-traffic locations of the field to prevent soil compaction. If you continually struggle with rust

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year after year, numerous fungicides from the strobilurin or DMI class of fungicides can easily provide 21-28 days of rust control.

### 3 NECROTIC RING SPOT

As a root-infecting fungus, this (*Ophiosphaerella korrae*) is one of the more frustrating diseases an sports turf manager can face because once symptoms appear it's too late to treat for the fungus. Adding to the frustration, fungicide applications are notoriously ineffective for this disease because the timing of application is critical and the fungicide also must be watered into the rootzone to the point of infection...and it's darned hard to water a fungicide through 2 inches of grass and a half inch of thatch. The necrotic ring spot fungus is only active on turf roots when soil temperatures are roughly between 55 and 65°F, which is usually mid to late spring. But the circular frog-eye patches characteristic of the disease (Figure 4) often don't appear until early summer, after the fungus has gone into dormancy.



▲ **Figure 4: NECROTIC RING SPOT** can be devastating on recently-sodded turf, something quite common on athletic fields.

At this point, all you can do is manage or 'baby' the turf and its weakened root system the best you can through more frequent irrigation and fertilization. If you repeatedly observe this disease on your field, implement any healthy rooting practices you can think of to increase the number of healthy roots and help the plant ward off symptoms. In addition, use acidifying fertilizers or other acidifying amendments because the disease is more severe when soil pH is above 7.2. Since excessive thatch layers can harbor the fungus, work to minimize the thatch layer to one half inch of thickness or less. As a last resort, some granular fungicides may be able to provide suppression if applied at the proper soil temperature and watered in.

### 2 BROWN PATCH

If you manage a field with a significant amount of tall fescue, you likely know all about brown patch (*Rhizoctonia solani*). This foliar fungus requires prolonged periods of hot, humid weather to cause disease and can ravage tall fescue plants if left



▲ **Figure 5: IF YOU SEE** white mycelium following hot, humid weather in the summer don't automatically assume it's Pythium blight...it may be brown patch.

unchecked. Symptoms appear as diffuse patches of slightly brown or even purple-colored turf, and in active infections white mycelium can be present in the turf canopy (Figure 5). Fungicide applications are an effective means for controlling brown patch, especially Prostar or those from the strobilurin class. However, limiting nitrogen fertilization and irrigation during hot periods can significantly suppress the disease in the absence of fungicides. However, if you manage tall fescue or experience prolonged periods of hot and wet summer weather, fungicides may be required for effective brown patch control.

### 1 SUMMER PATCH

This root-infecting disease (*Magnaporthe poae*) is similar to, and often confused with, necrotic ring spot but has a few key differences. Like necrotic ring spot, summer patch is a root-infecting fungus that primarily impacts Kentucky bluegrass (though ryegrass and fine fescues can also be impacted). Like necrotic ring spot,



▲ **Figure 6: OFTEN** similar in appearance to necrotic ring spot, summer patch can be destructive even on high-end athletic fields because of the inability to detect its presence until the damage has been done.

symptoms appear as roughly circular patches of tan turf that can sometimes partially fill in with weeds or grass to create 'frog-eye' patches (Figure 6). The key difference, however, lies in the active temperature range of each disease. Whereas necrotic ring spot only infects when soil temperatures are between approximately 55 and 65°F, the summer patch fungus BEGINS to infect roots once soil temperatures reach approximately 60°F.

As the soil temperatures rise through summer the fungus infects more and more turfgrass roots until sometime in mid-summer when the remaining functioning roots cannot support the plant and it wilts and dies. A fungicide application once symptoms have appeared will stop the current infection from spreading (assuming you get the fungicide down into the roots). However, because the infection decimated so much of the root system, the symptoms are likely to persist and the plants weakened for the rest of the summer. Methods for reducing summer patch infection include healthy rooting practices (summer patch is worse where thatch is excessive and in poorly draining or compacted soils) and reducing the soil pH to under 6.5 through acidifying fertilization or other means. Where summer patch is a consistent problem, fungicides from the strobilurin or DMI class can be used and should be applied in the late spring when soil temperatures are approaching 60°F. Care should be taken to water the fungicides into the top inch of the soil where the fungus is active.

The aforementioned diseases are not the only diseases you will find on your athletic field, and even determining which disease is present on your turf (or if it's a disease at all!) can be very taxing. If you're unsure, I recommend submitting a sample to a diagnostic lab that specializes in turfgrass diagnostics to confirm the presence of a disease PRIOR to applying a fungicide. It's better to spend \$100 on proper diagnostics than waste \$500 on a misapplied fungicide. Many universities around the country, including the Turfgrass Diagnostic Lab at Wisconsin (www.tdl.wisc.edu), have excellent turf diagnostic facilities and can provide needed support to properly diagnose your problem. For the most effective chemical control options check with your local sales representative, extension agent, or look up the University of Kentucky's "Chemical Control of Turfgrass Diseases 2013" online. ■

*Paul Koch, PhD, is an associate researcher, turfgrass pathology, at the University of Wisconsin-Madison.*



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# State of Seed Supply REPORT

**Editor's note:** We asked principals from seed companies across the country to answer two questions: What is the state of the supply of your grass seed crop used for sports fields heading into the overseeding and heavy-use football seasons? And, what is the state of supply for sports turf looking like for Spring 2014 growing season? Here are the responses we received:

**AARON KUENZI,**  
VP-Marketing Manager  
Mountain View Seeds

As we analyze the "State of the Seed Supply" for 2013 and spring 2014 we can be assured of one thing, change. One change will be pricing due to limited supplies.

Supplies of most species of cool-season grass will be tight due to less inventory, lower seed production acres and solid demand. Our seed inventory carryover from the previous year is near a record low. Seed production acres are low as well. Our growers are making economic and agronomic choices to grow other crops. Economically these other crops produce either a higher net return or a quicker return. Growers are also choosing to rotate between crops such as clover, wheat and grass for the agronomic benefits. Looking forward we don't see a lot of change from the production side.

For 2013 we again should see tight supplies and firm prices, as the general consensus is we do not have enough production of seed. As of today the seed harvest is less than average and our crop will be short. We expect to see firm pricing for fall of 2013 and into spring of 2014. In our opinion perennial ryegrass, fine fescues and Kentucky bluegrass will be affected the most. So this year be prepared to order early especially if you need a specific variety and/or quality of seed.

**JOHN RECTOR,**  
turf products manager  
Barenbrug USA

New Crop 2013 seed supplies are looking good for sports turf grasses from Barenbrug USA. Though competition for seed production acres remains strong, we anticipate a good supply of seed for our distribution partners that service the sports turf industry.

RPR, Regenerating Perennial Ryegrass, named a 2011 Innovative Product by the STMA, has shown increased use each year since its first release. Now christened with a new botanical name, *Lolium perenne subsp. stoloniferum*, RPR's reputation for durability and traffic recovery has grown significantly in the sports turf industry. Now representing three varieties, RPR continues to perform well in the traditional ryegrass climates and in unlikely areas such as the turf transition zone. Developed from 'Virginia' traffic survivors, RPR's durability in difficult summer conditions is both remarkable and unusual for perennial ryegrass. Supply for RPR looks very good.

The newest member of our 'Sports Turf' family is our Turf Blue HGT Kentucky bluegrass blend. To date, the performance of this blend of bluegrasses has been nothing short of amazing. On one particular Maryland Soccer complex, newly seeded Turf Blue HGT was successfully played on 35 days after seeding and the field is still playing like a champ this summer. '35 days and play' is unheard of for any species, let alone a bluegrass. Its key component, Barvette HGT, performed exceptionally well in the recently completed NTEP KB trial (2005 thru 2010). In the brutal transition zone, Barvette HGT finished in the top statistical grouping or #1 for 16 different evaluated turfgrass traits. At this time new crop supply looks very good and we're optimistic for excellent quality.

Barenbrug also provides the world's only true rhizomatous tall fescues, Turf Saver RTF. With establishment, RTF develops a strong system of true rhizomes and a deep, extensive root system. Turf Saver RTF supplies also look very good.

Bermudagrass supplies also look good with prices leveling off. Our Barbados Brand, featuring SWI-1044, is an outstanding product for those fields needing an elite feel to

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Yukon bermudagrass has excellent high quality seed. -Leah A. Brilman, PhD, director of research and technical services, Seed Research of Oregon



them. Also with excellent NTEP performance, 2002-2006, SWI-1044 exhibits many top performing traits for sports turf uses.

Another Barenbrug exclusive is our proprietary coating technology called Yellow Jacket. Yellow Jacket provides strong absorbant technology combined with Dormancy Breaker and Apron XL to provide the best in seedling development and protection. Yellow Jacket technology is available on most Barenbrug products and most custom mixes.

**DUANE KLUNDT,**  
**VP of sales Grassland Oregon**

Most cool season turf grasses are in a balanced, to less than favorable state. This coupled with the Pacific Northwest weird weather patterns this past year (super dry fall, very wet early winter, very dry late winter, hotter than normal spring, and cool early summer, and now dry) may cause some quality issues. The result maybe some heartburn for those looking for high quality seed at a good price, it may just not be

there. Perennial Ryegrass is in very tight supply and coupled with a record high grower price for the fall of 2013 and the pressure for good quality, we would recommend buying your seed as early as you can to ensure the best price and best quality you can. Kentucky bluegrass is also in a similar situation, with production being about as low as it has been in decades, and the elite Kentucky bluegrass varieties being in short supplies due to the residual scars of the past downturn in economy, again I would buy your needs early. Turf Type Tall Fescue is still in a fairly tight situation but it should be way more balanced thus maintaining a stable price throughout the year, but quality may still be an issue with some varieties being extremely short. Seed inventories are about as short as they have been in quite some time so this is not a year to procrastinate.

Quality will be a problem come spring, if the seed crop continues to come in as it is supplies could be very tight in early 2014. As

stated in the fall section I would buy or book my seed as early as possible with your distributor, that way they can arrange to get the supplies the sports turf managers need. We need to remember cool season turf grass is harvested in July/August and it will not happen again until next year. It cannot simply be manufactured, so it will require the turf manager to make sure some planning is done. Do your homework now for next spring to assure you get what you need, both in quality and in the quantity.

**JOHN T. LAMLE,**  
**VP of research and production**  
**Johnston Seed Company**

Johnston Seed Company is the exclusive producer and marketer of Riviera Bermuda-grass seed. We had an excellent supply of seed for the sportsturf market in 2013 and will have an excellent supply to meet those needs in 2014. We do not produce any cool-season grasses for the overseeding market, so I can not contribute to that request. ■



**A CELEBRATION OF SPORTS**

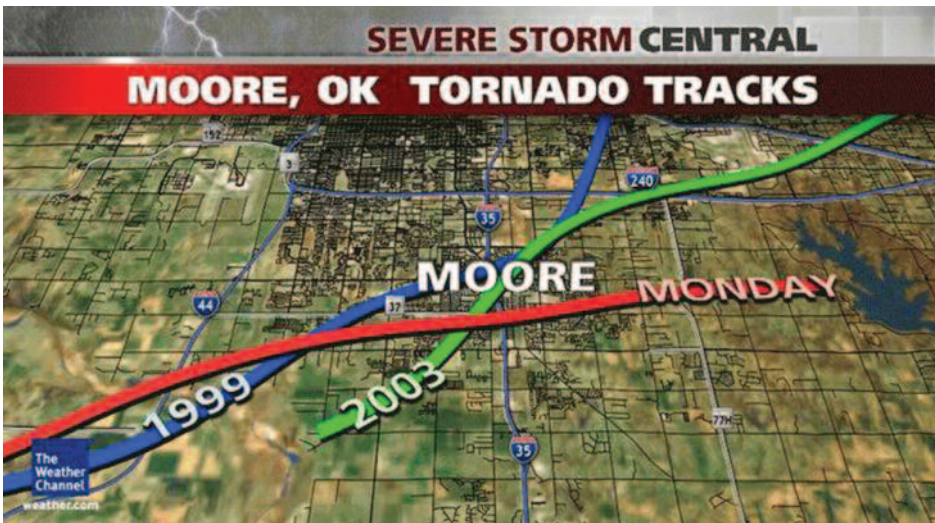
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## Important things in life: “Moore” than grass

**H**OW OFTEN IN LIFE DO WE TAKE THINGS FOR GRANTED? How often are we so caught up in our jobs and responsibilities that we just stop for once what we are doing and be thankful for what do have? Our families and relatives, our house, our cars, our jobs...when we are faithful and take that precious moment before we head to our professions for the day and be thankful and gracious, giving hugs and kisses to our loved ones. On May 20 and 21, 2013 all things changed in central Oklahoma.

We in Oklahoma live in what is commonly known as Tornado Alley, in the late

spring where the cold air coming over the Rocky Mountains clashes with warm moist air out of the Gulf of Mexico. During a stretch of time in May this year, tornadoes were popping up daily. We commonly are the guinea pig for weather as the nation can see where the storms are building and coming from. In a 14-year span, Moore, OK has received two EF5 and one EF3 tornadoes in almost the same path. (see [http://s.imwx.com/common/articles/images/201305/mooretrack-52113\\_650x366.jpg](http://s.imwx.com/common/articles/images/201305/mooretrack-52113_650x366.jpg)).

Various other towns in Oklahoma such as Little Axe, Shawnee, El Reno and Yukon

◀ **TWO EXAMPLES** of damage from the tornado.

have received their fair share of tornadoes. As a matter in fact, one week after the tornado in Moore, the widest tornado ever recorded, 2.6 miles wide, hit near El Reno, OK.

In Oklahoma, the forecasters and meteorologists are right on top of the weather when the atmosphere is unstable. It is a Mecca for storm chasers as they come in droves when things are in alignment. In Norman, the National Weather Service houses its National Storm Center and is very informative to the general public. On May 20, tornadoes skirted the heavily populated areas in central Oklahoma, but did not hit some of the rural areas. However, the metro area of Oklahoma City was forewarned that the same scenario was going to happen the next day, May 21, but supposed to be worse and to be prepared. Everyone was told about the time things were going to fire up on Monday. People at the beginning of the day were planning when they were going to take off work and pick kids up before schools were let out.

- 2:40 pm CDT: A tornado warning was issued that included Moore

- 2:52 pm: Radar indicates rotation may be reaching the ground near Moore

- 2:56 pm: First reports of a tornado in progress

- 3:01 pm: Tornado Emergency issued for Moore

- 3:36 pm: Tornado “ropes out” and dissipates

- 3:43 pm: First images of destruction surface

- 6:07 pm: Damaged areas in comparisons immediately drawn to Joplin, MO tornado of 2011

- 7:16 pm: Death toll announced at 37 by Associated Press, via Twitter

The tornado was on the ground for some 40 minutes. Eventually it was determined that 24 people perished during the tornado, including seven children. Some of the children were ones that were still at the schools of Plaza Towers Elementary and Briarwood Elementary, which were completely leveled. I personally was on the scene in Moore at about 8:30pm. I went

with a neighbor to help his son repair his damaged house, as more rain was expected.

Others were not so fortunate with their houses. I have never seen so much destruction immediately following an EF 5 tornado. Homes completely gone, down to the slab of concrete that it was built on, water coming out of pipes, telephone poles snapped and electric power lines laying on the ground and the heavy smell of natural gas, cars overturned and mangled, and debris spew all over the place wondering where it came from. There were members of our athletic staff at OU that completely lost their homes. People that I know whose families' lost everything. My wife and I housed a father and his son, displaced by the tornado, for a week at our house. So much loss. Initial estimates indicated that it will cost upwards of \$2 billion. It will take years to rebuild, just like in 1999; some say that it was worse.

One aspect of Oklahomans, they come together, as they have done so many other times in the past. People helping people; strangers pitched in and helped clean up Moore and the surrounding areas. Support from so many others across the nation. Native Oklahoman and country music singer Blake Shelton put on a benefit concert at the Chesapeake Arena in OKC that raised an estimated \$6 million. Triage and relief set up at the churches surrounding the damaged area. Meals, clothing, shelter all provided by people in the surrounding communities.

Country music star Toby Keith, a native of Moore who resides in Norman, decided to have a concert billed as the Oklahoma Twister Relief Concert. The site was Owen Field on the campus of the University of Oklahoma on July 6. To add to the docket, Garth Brooks, Trisha Yearwood, Ronnie Dunn, Willie Nelson, John Anderson, Mel Tillis, Sammy Hagar, a video performance by Carrie Underwood and a few other artists were scheduled. The concert sold out in less than an hour with a ticket price of \$25. The concert is speculated to be the largest concert ever in the state of Oklahoma, with an attendance of 65,000+. All

proceeds from the concert went to the United Way to go to those impacted by the tornadoes. So many aspects of putting the concert on were donated: field protection system, trucking, stage, rigging, lighting, equipment. All put together in a matter of 3 ½ weeks. Not an ideal time to be putting on a concert in July, when many of these things are spoken for the summer and other tours.

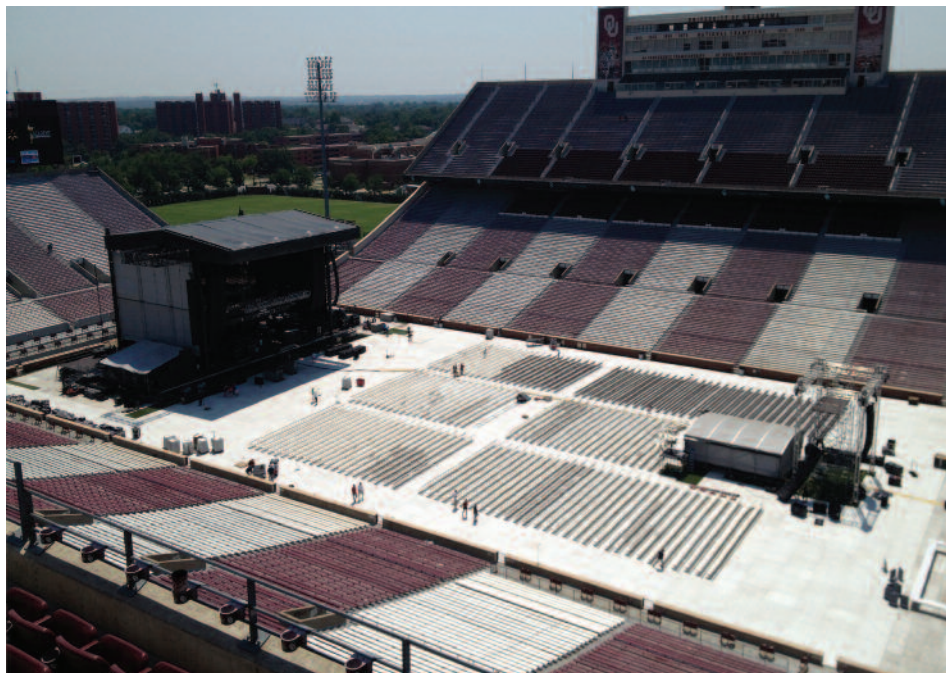
### CHALLENGE AHEAD

This is where the turf manager's hat comes off; all the things of "No... not a concert in July during the heat of the summer!" instead are "how are we able to help people in need, people that have nothing?" This was an improvised concert but put together by some of the best in the business. All resources had to be pooled together quickly. Our challenge as turf managers at OU was to save as much as the field as we could understanding we were in a non-revenue, donating situation with this event. Our administration in OU Athletics assured us that any replacement needs would be fulfilled.

Once we received confirmation that we would be hosting a concert, the first phone calls I placed were to Michael Beane, CEO of Terraplas, and Kyle Waters, VP of Operations at the StubHub Center in Carson,

CA. Both have ties to Oklahoma, as Mike had a daughter here at OU in 1999 and Kyle is a native Oklahoman. Both immediately jumped on board in support. Mike supplied the Terratrak drivable roadway and Kyle provided the Terraflor. Load-in of the Terratrak started late Monday evening July 1 with the stage steel set-up starting on July 2. Three days of stage building, a production day and then the all-day concert. Terratrak around the stage was down 6 days, the Terraflor for the seating area was down just over 48 hours. During the 6 days while it was down, the Terratrak surrounding the stage received heavy use of forklifts, a 40-ton crane and two 5 ton flat-bed trucks. We were able to omit a Terratrak roadway in front of the stage during a majority of the stage build. This was key as we were able to keep the heavy weighted traffic off of the main area of the playing surface and off to the sideline areas.

Some stadium events you have months of preparation for, we had a couple of weeks. We felt we went into the Terratrak build with about the right amount of moisture in the sand base as well as supplementing the TifSport bermudagrass with ample amounts of potassium, magnesium and elements to strengthen the grass's cellular walls. We were also very lean on nitrogen and the field was rolled and firmed up with



▶ **SETTING UP** for the concert.



▲ **Top Left: USING THE GREENONE KORO MACHINE** to take out some sod after the concert. **Top Right: PUTTING IN THE FRESH SOD.**  
**Bottom: GOOD VIEW** after sod was placed.

a 3 ton roller. The first week of July we actually caught a break in the weather as a cold front came through central Oklahoma bringing daytime highs in the low to mid 80's. Normally temperatures are in the mid to upper 90's. Soil temperatures under the Terratrak (81 F) were just a couple of degrees warmer than where grass was not covered (77 F). Most all Terratrak and Terraflor builds and removals were done in the overnight hours to help the install crews as well making the moves less stressful on the grass. By Production Day and Concert Day, ambient temperatures crept back up into the low to

mid 90's. We received the field back to us later in the evening Sunday, July 7.

We started our post-concert maintenance plan as soon as the last piece of Terratrak was removed. We did this in the wake of the cooler overnight hours. The field was raked to stand the grass back up where Terratrak has been laying around the stage and roadway out to the front of house mix tower. We let the field rest and sit the remainder of the night. On Monday, the entire field was verticut and swept to help the rootzone to breathe even more and to remove

any bruised or matted leaf tissue. An application of ammonium sulfate was made and water was turned back on. On Tuesday, the field was deep-tined aerified and cores removed. Then flushing cycles of irrigation water began to help remove contaminants. On Wednesday, weaker areas were overseeded with Riveria bermudagrass seed and the field was topdressed with sand.

The week after the concert brought good bermudagrass growing weather with temperatures in the mid-90s to 100, but that was followed by an unusual cold front that lasted 4 days and brought 6" of rain. Temperatures dove back into the mid-70s during this time and really putting a damper on recovery and coordinating with contractors to replace any damaged areas. The fourth week of July we were able to resod areas of heavy traffic on the roadway behind the stage as well as some weaker areas on the field. We contracted with GreenONE Industries, Inc to use the Koro Imants Field Topmaker to take out 1 1/2" of sod. We also purchased the replacement thick cut Tifway 419 sod from Tri-TexTurfgrass. In all, much less was replaced than was anticipated before the concert. Much of the rest of the areas under stage and on the field were able to make a full recovery.

In this particular situation and devastating event, it's more than just the grass. We do work so hard to get the grass to where we want it to optimally perform. We are passionate about our jobs and doing what is best for our fields. But grass can be replaced. It always helps to keep things in perspective. Be sure that we take time to appreciate the ones we really live for. You can't replace someone that



▲ **PICTURE OF FIELD** one month after concert ready for scrimmage.

you lost. We do take ownership in the fields that we manage, but in the words of a good friend of mine... "it's not your field." On this particular night, it was for those that had lost a loved one, a home, a business. This is a healing process that will take much longer... ■

*Jeff Salmond, CSFM, is director of athletic field management at the University of Oklahoma, and a Board member of the Sports Turf Managers Association.*

## STMA in action

# STMA introduces new Membership Incentives, Referral Rewards

**STMA IS NOW OFFERING** a number of incentives to new members and a referral bonus program, both designed to help the association build on its continued growth.

### New Member Benefits

New members—those individuals who have not been an STMA national member since 2000—are now eligible to receive a **free conference registration** (valued at \$375, to be used within 3 years) when they purchase an STMA membership. This new member offer is valid for the association's sports turf manager and commercial categories, including individuals at the associate level (sports turf manager and commercial associates). Unfortunately, new affiliate and student members are not eligible for the free conference registration benefit.

Those members who joined in 2013, especially those individuals who signed up during the association's recent prorated dues

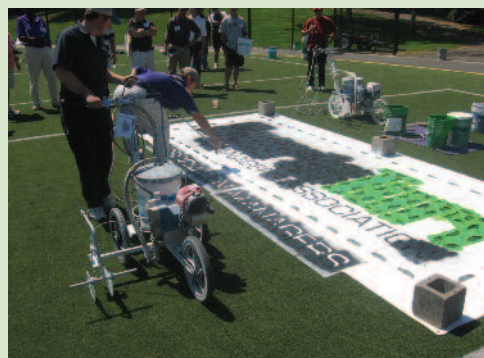
promotion, are eligible for the free conference registration promotion if they renew for 2014.

To see if you qualify for the free conference promotion, please visit [www.STMA.org](http://www.STMA.org) or call the STMA office at 800.323.3875.

### STMA Referral Rewards

All STMA members are eligible for the association's new referral rewards program. Any current member who refers a new qualifying individual that signs up for a membership will receive a \$100 voucher that can be used on a variety of items, including STMA merchandise, conference registration fees or membership dues. There is no limit to the number of new recruits a member can refer; he/she will receive the \$100 voucher incentive for each new person they refer who signs up.

Stay tuned for more details at [www.STMA.org](http://www.STMA.org). ■





# Drainage systems 101

“**R**ainout” might just be an honorary four-letter word in your vocabulary if you’re a field manager. Consider the problems they cause:

- Games that need to be rescheduled
- Schedules that need to be reshuffled and of course:
- Complaints you have to hear (as though you personally ordered up the rain)

Unless your field is in a desert area, there’s a good chance that you’re going to have to deal with rainouts at various times throughout the year. The key to getting the schedule back on track (and the complaints minimized) is a good drainage system. In fact, good drainage is probably the most important factor in long-term performance of a field, and in making the field valuable to the owner.

Work with a design professional to help you come up with a plan for an efficient system for your field. The designer will take into consideration 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, the annual amount and intensity of rainfall, local codes and regulations regarding stormwater management. The professional will be able to 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.

Something that has been mentioned previously: drainage systems (in this case, the systems under the playing area) should be designed only for water that falls on the field because of precipitation, or because of irrigation. In other words, a field should not be receiving water that runs down off bleachers, drips from dugout roofs or runs off the track.

Surface drainage controls water from precipitation and water from those other areas, including water that drains off following the irrigation of planted areas adjacent to a field. There are three types of surface drainage systems: open systems, closed systems and combination systems.

**There are three types of surface drainage systems: open systems, closed systems and combination systems.**

**Open systems** use swales (natural drainage channels covered with vegetation, usually grass) and gutters (paved swales) to divert water away from the field(s). Open systems rely on slope (gravity) alone to move water away. Lawn swales should be sloped to prevent the accumulation of standing water and to avoid erosion. An open system is fairly inexpensive to build if there is room and if the ground is easily workable. Open systems are less practical on sites where space is limited.

**Closed systems**, on the other hand, include pipes so water is collected and transported in a contained system.

**Trench drains:** There are two types of closed trench drains: gravel drains and grated drains. Gravel drains consist of an open trench with a sloping bottom filled with free-draining stone, with or without a pipe. The trench usually is lined with a non-woven geotextile filter fabric allowing water but not solids to pass through. Next, a porous or perforated pipe is laid along the bottom of the trench on a gravel bed. The remainder of the trench then is filled with gravel to the surface and left open to catch storm water while the pipe at the bottom collects it and carries it away.

Similar options include a grated trench drain (commonly called a channel drain), a gutter made of concrete or prefabricated sectional material, or a slot drain consisting of a prefabricated sectional material placed in a narrow trench. Any of these options will include a grate that prevents debris from entering.

The advantage of closed drains is their top surface can be set at a uniform grade, eliminating the need for a sloped swale or gutter. The bottom of the trench slopes instead of the surface. This is particularly useful where there is limited area around the field. In addition, it is quite common to use a gravel trench drain to act as both a surface and subsurface drain.

**Catch basins:** Where the presence of buildings, rocks, trees and/or other fixed obstructions, or significant changes in elevation

on the site preclude moving stormwater to a storm sewer or appropriate drain field, a catch basin located at a safe distance from the field and from normal foot traffic, may be used. A catch basin is a below-grade structure, typically made of pre-cast concrete, masonry (block) or pre-molded PVC, with a plastic or metal grate on top.

Water is directed by swales, gutters or trench drains to the catch basin and from there it is dispersed. If a catch basin is provided with a sump below the invert-out, it promotes water quality improvement by allowing the settlement of silt, soils and other debris. In many cases, it allows water to safely be dispersed into storm sewers, creeks, ponds, wetlands or other environmentally sensitive areas.

In other cases, a catch basin is designed with a perforated sump in order to provide infiltration into the surrounding soils. This is done in areas where soils are highly permeable and the water table is deep enough to allow such infiltration. If constructed in this manner, a catch basin is commonly called an infiltration basin or a leaching basin. Area drains, drain inlets and in-line drains also are used to remove water from the surface and direct it into a closed drainage system.

In reality, most surface drainage systems are made up of a combination of swales, gutters, trench drains and/or catch basins, known as a combination system.

These systems treat only surface water and may be insufficient if the site is low and a large area of land drains onto it, or if there is a large amount of ground water. They are, however, useful to remove water drained off the field or off nearby buildings or pavements.

## SUBSURFACE DRAINAGE

Subsurface drainage addresses the management of water below ground. Water will naturally drain from high areas to low areas both on the surface and underground. Additionally, there may be natural ground water channels within a site.

A French drain places an underground barrier between the facility and approaching subsurface water. The most common type of French drain consists of a trench separating areas of ground water accumulation or flow from the facility. The width, depth, location and number of French drains on a site depends on the soil conditions, the water table and the amount of water needing to be captured and relocated. Generally, a French drain consists of a rectangular trench filled with permeable aggregate extending to the surface, allowing the French drain to serve both surface and subsurface flows. The side walls and



bottom of the trench typically are lined with a suitable drainage filter fabric. Normally a French drain does not include a pipe; however, the inclusion of a pipe makes this type of drainage system more efficient.

A subdrain is similar to a French drain but it does not extend to the surface and always includes a perforated pipe. In the construction of a subdrain, the trench is sometimes wrapped with a suitable drainage filter fabric. In some conditions, however, the use of a pre-wrapped perforated pipe might be preferred by the design professional. Some design professionals prefer to keep the drainage filter fabric as a material separator to keep the natural subgrade soils from the drainage stone only. In this case, the fabric is placed on the subgrade and the drainage pipe is free floating in the clean stone drainage trench.

A relatively new variation of both the French drain and the subdrain uses a geocomposite drainage material. This material facilitates the construction of subsurface drainage with a much smaller trench or profile. Geocomposite drainage material is available in various sizes, depending on the amount of water to be handled and the rate of flow desired. The geocomposite is inserted in the trench

where its unique shape allows for unobstructed water flow in a narrow trench. In some cases the design will incorporate a geocomposite or molded plastic drainage material directly under the synthetic turf or under a thin layer of drainage stone. In these two scenarios, the geocomposite is basically a substitute for a more substantial layer of drainage stone. The geocomposite is typically covered by a non-woven filter fabric to prevent soil and other small particles from clogging the drainage medium.

Another variation of the French drain, called a footing drain, is used behind a retaining wall or other structure where removal of ground water is prudent.

Any of these French drain or subdrain systems will terminate in a storm sewer connection or carry the water to an area of the site where it can be stored for reuse or dispersed in a responsible manner. These will be discussed in a subsequent article. ■

*Mary Helen Sprecher wrote this article on behalf of the American Sports Builders Association. Available at no charge is a listing of all publications offered by the ASBA, as well as their Membership Directory. Call 866-501-2722 or see [www.sportsbuilders.org](http://www.sportsbuilders.org).*

### STMA in action

## STMA Sourcebook relaunching with improved functionality, competitive pricing

**EFFECTIVE LATE AUGUST 2013**, the Sports Turf Managers Association *Sourcebook*, the premier online resource connecting sports turf professionals with the most relevant industry products and services, will feature a new look and enhanced functionality for 2013. Created jointly by STMA and Green Media (publisher of *SportsTurf* magazine), the reengineered *STMA Sourcebook* improves upon past efforts by connecting association members with the most comprehensive, relevant selection of manufacturers and suppliers in the industry. In addition to its already completed work reconstructing the *Sourcebook's* infrastructure and improving search functionalities, Green Media will assume all database maintenance, information integrity, and online advertising responsibilities related to the site moving forward. Benefits of this reorganization include an increased emphasis on participating commercial companies, comprehensive turnkey solutions that will include concurrent *SportsTurf*

magazine print and online advertising packages, and more varied pricing structures.

The *STMA Sourcebook* eliminates the hassle of lengthy search engine efforts by providing in-depth information about products and services specific to the sports turf industry. Users of the *STMA Sourcebook* can find vendors and their products using the search function or relevant category headings, and then refine the search by keyword and/or geographic location. Incorporating detailed lists of relevant companies, the *STMA Sourcebook* ensures the directory is populated with manufacturers and suppliers that cater to the sports turf industry (thereby eliminating the unwanted and unrelated results common with standard search engines). As a new added *Sourcebook* member benefit, all STMA commercial company members will receive priority placement and appear first in search results.



Manufacturers and suppliers benefit from the *STMA Sourcebook* by being part of an online community that allows advertisers to connect directly to their target audience. The *STMA Sourcebook* provides advertisers with a wealth of listing and enhancement choices, including the *Product Showcase*, priority and premium placement options, banner advertising, page peels, video, enhanced keyword search functionality, and much more.

The *STMA Sourcebook* is available via the STMA website ([www.STMA.org](http://www.STMA.org)) or directly at [www.STMAsourcebook.com](http://www.STMAsourcebook.com). ■



# JOHN MASCARO'S PHOTO QUIZ

## Answers from page 17

**THESE PHOTOS** are from the Cincinnati Bengals practice facility. The brown "X" shaped mark is the result of a conditioning drill the rehabilitation guys do. Apparently, this newly conceived method of exercise combines strength training and torture. During this activity, the players swing large heavy ropes that are attached to a heavy center weight around in circles. After enough repetition, the rope abrasion on the grass causes damage. The sports turf manager reports that these areas recover naturally after about 4 days without any additional efforts. I asked if this was the most destructive drill that they perform and he said that they have one drill that he does dread much more than this one. It encompasses some team members lifting large 60-pound rocks over the players head for one minute and then they drop them on the field. This drill produces large divots and is despised by the grounds crew. ■

*Photo submitted by Darian Daily, head groundskeeper at Paul Brown Stadium in Cincinnati.*



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.



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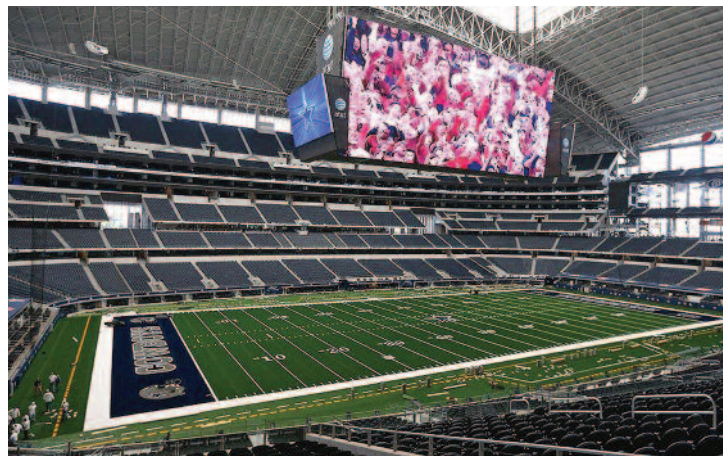
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## DETAILS ON NEW ROLL-UP TURF AT COWBOYS STADIUM

**H**ELLAS SPORTS CONSTRUCTION'S TURF DIVISION recently installed its patented SoftTop turf technology combined with its Matrix Turf system at Cowboys Stadium in Dallas. This system allows the artificial turf panels to be rolled up and stored, and then later unrolled and reconnected, to accommodate a wide variety of sporting and non-sporting events. The system in Dallas features interchangeable panels that make up three separate fields: NFL, NCAA/high school football, and FIFA soccer.

Bruce V. Layman, vice president of Hel-

las' Turf Division, answered these questions for us:

**SportsTurf:** What if anything is unique about the specific system installed at Cowboys Stadium?

**Layman:** What is unique about Cowboys is all of the markings are installed without disturbing the integrity of the manufactured backing system. The end zones are completely computer tufted. There are no inlay markings in the end zones.

**ST:** What ancillary equipment is needed to operate the roll-up system?

**Layman:** The Hellas Hopper, which is an apparatus attached to a forklift. This device is used to carry the rolls to and from storage. It is also used install and remove rolls.

**ST:** Is there a similar product available to facilities that don't have the same resources as the Cowboys?

**Layman:** There are several. The Alamo dome, the University of Idaho, Northern Arizona University, and Idaho State University all have the system.

**ST:** Describe the process for removing the field—how long does it take, how many people, etc.

**Layman:** It takes 650 labor man hours for turf installation, and 350 labor man hours to remove the turf. ■

## OWNING A TOPDRESSER

**M**ANY SCHOOLS, universities, and city parks have never done their own application of topdressing of sand or compost. They have always paid someone else to do the topdressing for them which may mean that it does not get done at the optimum time for their turf. At some point the turf manager might find himself considering the purchase of a topdresser and wondering what he needs to know to make a good decision.

There are four important things to consider when deciding whether the time is right to purchase a topdresser.

The area, in square feet of the average fields to be top dressed

The size and capacity of the topdresser

The size of the loader bucket

The logistics of making the trips from the stock pile to the field

If you are only doing two or three turf fields, perhaps less than 90,000 square feet, the cost of owning and operating a topdresser may not be justified. If you own or manage more than three fields the cost of hiring a custom operator for 3 to 6 years starts to match the cost of buying a topdresser for your own use.

Generally the purchase of a topdresser will be worth considering as you approach the use of about 400 tons of sand a year. That is the equivalent of ¼ inch of sand spread over four football fields.

### Size or capacity of topdresser

There are many sizes of topdressers on the market, from less than 1 cubic yards to more than 6 cubic yards. In general a 4 cubic yard unit will take about 4 to 5 hours to spread 100 tons on a football. A 2 cubic yard unit will take about 8 to 10 hours to spread the same amount of material. Turf

tire pressure must be considered when using one of the larger units. To minimize tire pressure on the turf, a four wheel chassis has some advantages over the 2 wheel chassis. A larger tractor will also be needed for the larger units, so some care must be taken to match the size of the topdresser to other equipment in use on the premises.

Many people see how quickly a custom operator can complete a topdressing job. What they may fail to realize is that most custom operators use at least a one cubic yard loader bucket. If a turf manager purchases a

4 cubic yard topdresser but plans to use 1/2 yard bucket, the time needed to complete the job may be nearly doubled.

Maximum efficiency on a topdressing job is accomplished by careful placement of the supply pile, and by optimizing topdresser settings. This simply means setting four variables so that the topdresser is emptied in one round trip down the field and back, while applying the desired amount of material. This allows the operator to use the least amount of time to drive the empty machine back to the pile to refill.

The four variables are: ground speed, conveyor belt speed, spinner speed, and metering gate opening.

Owning a topdresser is ideal for many facilities, giving the manager the ability to treat his fields at the optimum time, and at a frequency that aids the maintenance of healthy turf. With a good understanding of the basic considerations discussed above, he or she can decide whether owning a topdresser is ideal for the budget as well. -By Glenn Musser, TurfTime Equipment. ■

# MAKING THE CASE FOR FERTIGATION

By Michael Chaplinsky

**Editor's note:** This article's author is president of Turf Feeding Systems, which sells fertigation systems.

**NOTHING HAS CHANGED.** Sports turf management and irrigation has not changed in the past 20 years. Albert Einstein defines "insanity" as, "Doing the same thing over and over and expecting a different result." The irrigation industry is marketing "smart controllers" so does that mean they have been selling dumb controllers for years before? Everyone is marketing the same mowers, sprinklers, rakes, and most everything but just painting them green and adding propane tanks doesn't make it different or better.

Sustainable sports field management can change the game. It's an economic value first, reducing usage and costs, and also improving the quality while fitting into any budget. It will reduce irrigation water, fertilizer, chemicals, labor and energy, while improving the quality. This management practice combines the automation of fertigation together with plant and soil health to create a more efficient plant and soil relationship.

## Fertigation

Fertigation is the most accurate way to micro-feed the plant and soil lightly with each irrigation cycle. Cars and trucks all use digital fuel injection to accurately manage the fuel system, and fertigation is digital nutrient injection to accurately feed and manage the nutrient delivery to the plant and soil. Each drop of irrigation water is lightly rich and sweet with plant and soil nutrients.

Fertigation can manage the sports field lightly when it is not being used or be adjusted higher to push the plant growth for recovery from damage from over use or heavy tournament play. It is a tool which can be added to any irrigation system to apply any type of nutrient program.

The efficiency of fertigation is realized by feeding lightly with each irrigation cycle. This close interval feeding can reduce the nutrient rates by at least 50% over the traditional soil stored dry fertil-

izer program. The traditional 1lbs of N per 1000ft<sup>2</sup> rate can be reduced to .5 lbs N per 1000ft<sup>2</sup> and be more manageable and produce better quality.

Fertigation feeds the plant by root uptake as well as 15% to 20% by foliar uptake, not realized by dry applications.

Drought stress is critical and fertigation can support the sports field in drought conditions with 3-day-a-week irrigation limits. It takes a lot of water to water-in a dry fertilizer application, but fertigation doesn't need it.

Rainy periods of days of rain like Florida is getting, will wash out all the dry fertilizer applied, but during a rain period the irrigation is not used and the fertilizer stays safely in the tank, waiting for a dry period to resume irrigation and fertigation. That benefit can save up to 30% of the annual fertilizer budget.

## Controlled application rates

Fertigation is the most accurate nutrient application program, giving the field manager, for the first time, personal growth control of his fields. He can minimize the growth to manage fields between seasons and just maintain the quality, or he can push the growth to get the fields ready for the season or an important tournament. It is all done with the injection rate setting for the fertigation pump.

Soil health is the key to producing a great sports field and healthy turfgrass with deep dense roots. Soil health will also balance the soil



## Tools&Equipment

pH, reduce sodium and release nutrients that are tied up and not available to the plant.

A soil test in most areas of the US will show phosphorus in the soil, but it may not be available for the plant. Phosphorus today is a very expensive and important nutrient, and all of the fertilizer salesmen want to sell you phosphorus, but why not just make it available, because it's free.

How do you increase the soil health?

It's simple and there are two simple steps to follow. First, stop killing all indigenous beneficial biology by using less chemicals and pesticides. The only biology in some sports fields are disease pathogens. It's like a hospital that is filled with disease.

When the soil is healthy with bio-diverse biology it will overpower and reduce disease pathogens. It's like putting border collies around your chicken house. They will prevent any coyote from getting close to the chicken. It is that symbiotic relationship that will build a barrier with the plants.

Plants that are strong and not in stress are succulent are disease and insect resistant. Healthy Plants have thick cell walls, which are resistant to fungus, and require less or no fungicides.

### Feed the soil

Many companies offer products and programs that will improve your soil health.

You can add any number of organic products to your fertilizer and inject it through fertigation or you can simply spray apply it. There are humic liquid products which feed the indigenous soil biology or bio-inoculants to inoculate the soil with special beneficial biology, like micro Rizal bacteria. This bacteria is well known for creating a network web around the root system to release nutrients for the plant as well as promote dense root systems for the plant.

Turfgrass will turn over its entire root system every 2 or 3 years, leaving tons of dead roots in the soil waiting to decompose and rot into humates. A healthy soil will quickly convert dead roots into humic substances. A humic particle will attract and release ten times the water and nutrients as a clay particle. This will create tons of little sponges that will hold and release water and nutrients in your soil.

It will also keep the soil open to allow it to hold and pass water freely. Watch this video by Ray Archuleta with the USDA to learn more. [http://www.youtube.com/watch?v=9\\_IteHCrLoQ](http://www.youtube.com/watch?v=9_IteHCrLoQ) . This shows how healthy soil will absorb and hold water better.

### Sodium

Sodium is a problem in many areas of the west and can build up in the soil. This is a big problem when the irrigation water has 100ppm to over 500ppm of sodium. The more the fields are irrigated the sodium keeps building up and the grass keeps dying.

The solution is in the soil and water. A healthy soil will prevent sodium from being tied up in the soil. Humates and other organic products can be injected through irrigation to release and buffer sodium from the soil. Serious sodium problems need serious solutions, and the best product for that is Sodium Blocker a clear liquid that does a great job for water and soil with very high sodium. This is a proven product that can be sprayed or injected. The product uses proven technology and is done every day with great success.

These are real methods and real technologies that work, and will improve your sports field while reducing the maintenance costs by 20% to 60%. But more important, it can reduce your water use up to 50% with your existing control system, by improving the plant and soil health and just turning down your irrigation time. ■



### Aeration equipment from Campey Imants

The Koro Recycling Dresser from Campey Imants, as the name suggests recycles the existing soils/root-zones and re-dresses the surface, helping to level the surface after play, and refresh the rootzone by decompacting and redistribution of material.

The Recycling Dresser is possibly the most effective aeration tool on the market that leaves the

surface in play. Amelioration of new materials into the existing soil structure is also possible.

The Imants Shockwave is the original linear aerator at its best with working depths between 3" to 14", working in compacted sports fields where most vertical aeration tools cannot. Protected by a torque limiting pto a huge aid to drainage and root development.

"The Shockwave is something I plan using many times year after year, its ease of use and small surface disruption is only a small part of the benefits I saw from it. I wasn't expecting the results I saw, it was hard to imagine something so simple could work so well in relieving compacted soil," says Chris Morrow, Field Supervisor for the Dallas Cowboys practice facility.

The Imants Rotoknife could be the fastest linear aerator working between 1" to 6". A series of discs slice the ground, decompacting and promoting a free draining surface and promoting root development or tilling a ground driven unit that works well in conjunction with other aeration methods. The surface is immediately playable after use.

**Campey Turf Care Systems**



### 3-stage walk-behind snow thrower

Cub Cadet's newest innovation will have you saying "bring it on" to even the most extreme winter forecasts. The new 3X, the flagship of Cub Cadet's X SERIES extreme line of

snow throwers, clears snow up to 50 percent faster than the 2X two-stage snow thrower. The 3X three-stage snow thrower easily cuts through 18 inches of heavy, wet snow. The patent-pending three-stage system works by first gathering snow, ice and slush and moving it toward the center. Then Cub Cadet's new high-volume accelerator cuts and chops through winter's worst, accelerating it into the high-performance discharge impeller, where it's thrown up and out of the high-impact chute. These three stages work together to move more snow faster while putting you in complete control of speed and maneuverability.

**Cub Cadet**

## Tribute Total approved for use on zoysiagrass

Environmental Science, a division of Bayer CropScience LP, announced Tribute Total can be used on zoysiagrass. Tribute Total, a novel post-emergent herbicide, delivers broad spectrum control in one complete solution to turf managers selectively remove the most troublesome grassy and broadleaf weeds, sedges and kyllingas. Tribute Total helps you better manage your labor input by eliminating the need for multiple products. Approved for use on bermudagrass and now zoysiagrass, it is effective against 55 grassy and broadleaf weeds including dallisgrass, crabgrass, and yellow and purple nutsedge.

**Bayer Environmental Science**



## Exmark 30-inch stand-on aerator

The Exmark 30-inch Stand-On Aerator delivers the productivity and durability professionals demand with a split-tine design to allow easier turning with tines engaged. The compact stand-on design heightens maneuverability in tight spaces while the 30-inch aeration width and 7.5-mph top speed deliver maximum productivity. Mass is centralized directly over the tines for maximum core depth consistency, and core depth is adjustable from 2- to 5-inches. The self-cleaning tines are easy-to-replace. Tine down-force is hydraulic-actuated and is easily adjusted by the operator. An electric-start Kawasaki® V-Twin powerplant delivers top-notch power, reliability and durability. The Exmark 30-inch Stand-On Aerator is covered by a one-year limited warranty.

**Exmark Manufacturing**



## TurfEx MS4500 electric-powered topdresser

The TurfEx 1.4 cubic-yard capacity MS4500 topdresser features polyethylene construction, fully electric operation and precision spreading. It has the ability to spread standard topdressing sand for golf courses, crumb rubber for synthetic turf fields and a variety of other bulk materials including compost and soil conditioners. The MS4500's heavy-duty polyethylene construction eliminates the corrosion and maintenance concerns associated with similar steel built models, while also making the unit up to 40-percent lighter. Furthermore, it features large flotation tires and exerts only 18 psi when fully loaded, allowing safe operation on delicate surfaces such as golf greens. The lightweight construction also lessens fuel consumption for the towing vehicle.

**TurfEx**



## Netafim multi-function hydrometers

Netafim USA now features multi-function hydrometers, water-saving devices that monitor irrigation flow rates and usage on commercial and institutional sites. The hydrometers provide visible, real-time data to help landscape managers evaluate water consumption on a daily basis. The versatile device features four functions: built-in master valve, water meter, flow sensor and pressure regulating valve. Hydrometers can be utilized in either dripline or overhead irrigation systems and are compatible with controllers from most major manufacturers. As more municipalities focus on water conservation, hydrometers have become practical tools in monitoring day-to-day water use. The product's globe-shaped master valve has a double chamber that provides positive openings and closings. It can function as a remote master valve for automated operation.

**Netafim**



## Control up to 22 zones with ESP-SMTe controller

After Rain Bird introduced the ESP-SMT smart control system in 2009, the weather-based, 13-station controller quickly made a name for itself as a technologically-advanced, water-efficient way to schedule irrigation. Now, Rain Bird is introducing the ESP-SMTe—an enhanced version of the original ESP-SMT that features numerous enhancements and the ability to manage up to 22 zones. Like its predecessor, the ESP-SMTe consists of two key components, a controller chassis with an integrated smart panel and an on-site weather station that includes a temperature sensor with an integrated solar shield and a unique tipping rain bucket for instantaneous rainfall measurement. An intuitive on-screen wizard prompts users for site-specific and zone-specific information to create a customized, optimum irrigation schedule.

**Rain Bird**



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## Panther Stadium, Oregon School District (WI)

### CHALLENGES

As the only groundskeeper for the Oregon School District, my biggest challenge has been that I do not have a degree in Turf Management. Despite this, I have a relentless passion, dedication and drive and I believe that has helped me to be the best turf manager I can be. I grew up on a farm and I've had experience working on a golf course but the majority of what I've learned came "on the job." I take notes of everything I do; I take before and after pictures and most importantly, I never settle for "good enough," I am always striving for improvement. At the end of every season, I go over my notes to find out what worked and what didn't work. I am in a

unique situation because all of the improvements to the field and around the stadium have come because of my hard work and dedication.

My first goal for improvement was to relieve compaction and limit unnecessary activity on the field. To relieve compaction, a drill-n-fill using Turface was performed in 2004 and again in 2009. I also aerate the field 8-10 times a year on average, recently switching the plugs from 3/4 inch to 1/2 inch which helps the holes repair faster and makes them less noticeable during the athletic season. If rain is expected before a football game, I spread Turface across the field. This helps to absorb moisture and stabilize the field for a safer playing surface. I also



- Level of Submission: Schools/Parks
- Category of Submission: Football
- Head Sports Turf Manager: Ron Novinska
- Title: Groundskeeper
- Education: High school plus turf continuing education
- Experience: I have learned everything on the job. I completed two UW Madison Turf Management Short courses. I also completed the University of Georgia's Turf Management online course. I belong to the STMA and WSTMA. I'm currently the Vice-President for the Wisconsin STMA chapter and was previously the treasurer.
- Full-time staff: Ron Novinska
- Other crew to recognize: Dan Prah, Josh Graber, and Mike Piper
- Original construction: 1966
- Turfgrass variety: Kentucky bluegrass and perennial ryegrass
- Overseed: I oversee from May to October. I broadcast seed before an event so the players "cleat" in the seed. I pre-germinate the seed as much as I can. I slit seed in June after aerating, then drag plugs to break them up and cover the seed. I create a divot mix that consists of pre-germinated seed, topsoil and Turface. I then walk the field, loosen any bare spots, add divot mix and cover with Pam 12.

**What I find most enjoyable about my job is EVERYTHING! There is a great deal of satisfaction that comes from working all year to get the stadium field in the best shape possible.**

# Membership Application

## SportsTurf MANAGERS ASSOCIATION

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Fax to: (785) 843-2977

Or mail with payment to:  
Sports Turf  
Managers Association  
P.O. Box 414029  
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Employer/ Facility \_\_\_\_\_

Business  Home

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City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

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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 qualifying 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

slice, especially if rain is expected before an event to help drain the field faster.

*Poa annua* has been an issue for me for quite a few years. A few years ago, I tried something new. I cut out the larger spots and put in new sod. I did this to help lessen the amount of seed that would get spread around, avoid injury to players from the turf giving way and avoid divots. Irrigation was another challenge that I didn't realize until last year. In June of 2010, in-ground irrigation was installed. Prior to the in-ground system, I watered with Kifco water wheels. I'm able to do light watering when I'm overseeding and water in extreme heat to "cool" down the turf.

My future challenges include trying to fix the field's crown. Since I don't see this being done in the near future, I will try to fix it myself. To do this I will need to sod cut areas, roll back the sod and either raise or lower the dirt. The crown is not terrible, but there are some spots that need fixing.

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

**Novinska:** First, I would like to say that I have tremendous support from the administrators and coaches and that is due, mostly in part, to our open lines of communication. I've had the opportunity to get feedback and suggestions from them and they've grown to trust my ideas and opinions. It's a win/win situation.

Whether it is an email, text, phone call or face to face meeting, there is always daily contact. My tip would be to build a good rapport with the people you are working for by being visible, available and responsive. These three things will help you earn their trust, respect and a better understanding of what it takes to do your job

**ST:** What are your specific job responsibilities? What do find most enjoyable? What task is your least favorite and why?

**Novinska:** What I find most enjoyable about my job is EVERYTHING! There is a great deal of satisfaction that comes from working all year to get the stadium field in the best shape possible. I take a lot of pride in what I do and as the only groundskeeper for the district I also feel a great deal of responsibility to make our fields the safest they can be.

I'm responsible for all aspects of turf maintenance for the high school athletic fields, but I am also a resource for landscaping and grounds care at all of the other district facilities. This includes mowing, fertilizing, painting, weed control and equipment maintenance. I also set up the fields for games, maintain turf and athletic equipment, and keep records of daily work, tree trimming and snow removal.

My least favorite task is not having enough time. Trying to get all the work done in a 40-hour work week is difficult and can be a little stressful, but I've learned to allow myself not to get completely caught up in it; it's true that it is a never-ending job, but if I look at it that way it becomes a burden.





**ST:** How did you get started in turf management?

**Novinska:** I started in turf management without really realizing it. I was the district delivery/mail driver at the time. During the summer months, there would be a few slow days, so I asked if I could fix up some fields. This also helped the custodians, who at the time were taking care of the fields along with the interior of the building. So I started to fix up the high school's two baseball fields by removing lips as well as edging. The district soon recognized that this was important and created the groundskeeper's position in the fall of 2003. My only prior experience in turf management was working at my uncle's golf course for a couple of summers. I learned landscaping, weed trimming and topdressing the greens from him and the rest I taught myself by reading as much as I could, attending turf seminars and field days and completing two online certificate courses through the University of Wisconsin-Madison and the University of Georgia.

**ST:** How do you balance your work and personal time?

**Novinska:** Balancing work and personal time has been good, and being in the K-12 level, isn't as big an issue because I only work 40 hours a week, a bit more during peak seasons. My family is very supportive.

**ST:** What changes are you planning to make or have you made to your maintenance plan for 2013, if any?

**Novinska:** I haven't made any major changes in 2013. I have been researching topdressing the stadium field with compost. There may be a small window of opportunity to do this yet this fall, but if not, I will try next year.

**ST:** Are you yet involved in sustainable management practices? If so, what are you doing?

**Novinska:** I'm becoming a little more involved in sustainable management. I soil test every year and have adjusted my fertilizer program because of the high rate of P and K, so over the past few years, I have only applied nitrogen. I'm looking into compost, and organic fertilizers. Installation of an irrigation system has helped me to manage water use. An irrigation system will be installed this fall on the practice football fields. This will help with water conservation by not having to occasionally water during the day.

**ST:** How do you see your job changing in the future?

**Novinska:** I see my job changing by the use of technology. Technology is playing a bigger part in the turf industry, with seed genetics to grow lights to even moisture testers, and it is constantly changing. Being the only groundskeeper, I need to find all the tools I can to help me get the job done. ■

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# STMA announces its Conference Schedule

**THE STMA ANNUAL CONFERENCE SCHEDULE** has been set. It includes several new events and officially starts on Wednesday, January 22. The printed conference brochure and the online version will be available October 1.

## SCHEDULE AT A GLANCE

### TUES., JAN. 21

- 6:30 – 9:00 am Continental Breakfast
- 6:30 am – 6:30 pm Registration Open
- 7 am – 5 pm Full Day Seminar on Wheels
- 9:00 am – 4 pm SAFE Golf Tournament
- 2:30 – 5 pm STMA Academy: 400+ level education included in full conference price
- 3:30 – 7:30 pm STMA Certification Exam
- 6 – 9 pm Chapter Officer Training (includes dinner)

### WED., JAN. 22

- 7 – 8 am Continental Breakfast
- 7 am – 6:30 pm Registration Open at Henry B. Gonzalez Convention Center
- 8 – 9:15 am General Session (New Time!): STMA Past, Present and Future. Keynote Address: “Skills to Survive in the Future” – Dr. Rick Rigsby, Educator & Former Broadcaster
- 9:30 am – 12 pm Conference Education
- 12 – 2 pm Break
- 12 – 2 pm Women’s Forum Lunch: New Time & Format!
- 2 – 5 pm Conference Education
- 5:15 – 6:15 pm Conference Networking Sessions
- 6:30 – 7:00 pm First-Timers Reception
- 7 – 10 pm Welcome Reception & Casino Night

### THURS., JAN. 23

- 6:45 – 7:45 am Certification Breakfast

- 7 – 8 am Continental Breakfast
- 7 am – 6:30 pm Registration Open
- 8 am – 12 pm Conference Education & Student Track
- 12 – 1:15 pm Annual Meeting & Lunch
- 1:30 – 6:30 pm SAFE Silent Auction on the trade show floor
- 1:30 – 7 pm STMA Exhibition - Dessert and Reception
- 2 – 6 pm Committee meetings on the trade show floor

### FRI., JAN. 24

- 7 – 8 am Continental Breakfast
- 7 – 8 am Past President’s Breakfast
- 7 am – 1 pm Registration Open
- 8:30 – 10:00 am Conference Education
- 8 – 10:30 am Student Challenge
- 9 – 10 am Commercial Member Meeting
- 10 am – 12:30 pm Silent Auction on the trade show floor
- 10 am – 1 pm Exhibition Open with Lunch, Innovative Sessions
- 12 – 1 pm Student Luncheon New Event!
- 1 – 5 pm Half Day Seminar on Wheels New Time!
- 1:15 – 3 pm Conference Education
- 2 – 3 pm Riverwalk Horticultural Tour via barge (1st departure) New Event!
- 2:30 – 3:30 pm Riverwalk Horticultural Tour via barge (2nd departure) New Event!
- 3 pm – 5 pm SAFE 5K Run/Walk New Event!
- 6:30 – 10 pm STMA Reception, Live Auction and Awards Banquet

### SAT., JAN. 25

- 8 am – 12 pm STMA Certification Exam
- 8 am – 1 pm ASBA Certification Exam

## Important STMA Deadline: October 15

**OCTOBER 15 MARKS** the deadline to submit applications for several of STMA’s programs. To access the applications, go on line at [www.STMA.org](http://www.STMA.org)

### Field of the Year

This highly competitive program recognizes the work of sports turf managers for five field types: Baseball, Football, Soccer, Softball and Sporting Grounds. For each field type, awards may be given in three categories: Professional, College and University, and Schools and Parks.

### Founders Awards

STMA’s Founders’ Awards are named after its four founders. These awards are STMA’s most prestigious and recognize those members who have made significant contributions to STMA or to the profession.

### Innovative Awards

Open to commercial members whose companies are exhibiting at the annual conference, these awards highlight significant advancements in technology, products and services that improve the sports turf management profession.

### Student Scholarships

Funded through The SAFE Foundation, undergraduate and graduate scholarships are awarded to high achieving students pursuing degrees in sports turf management or turfgrass research.

### Educational Grants

Also funded through The SAFE Foundation, two grants are available: one for a turfgrass student who has completed an internship, and one for a practitioner to fund travel expenses to the annual STMA Conference.

# STMA introduces new Membership Incentives, Referral Rewards

**STMA IS NOW OFFERING** a number of incentives to new members and a referral bonus program, both designed to help the association build on its continued growth.

## New Member Benefits

New members—those individuals who have not been an STMA national member since 2000—are now eligible to receive a **free conference registration** (valued at \$375, to be used within 3 years) when they purchase an STMA membership. This new member offer is valid for the association's sports turf manager and commercial categories, including individuals at the associate level (sports turf manager and commercial associates). Unfortunately, new affiliate and student members are not eligible for the free conference registration benefit.

Those members who joined in 2013, especially those individuals who signed up during the association's recent prorated

dues promotion, are eligible for the free conference registration promotion if they renew for 2014.

To see if you qualify for the free conference promotion, please visit [www.STMA.org](http://www.STMA.org) or call the STMA office at 800.323.3875.

## STMA Referral Rewards

All STMA members are eligible for the association's new referral rewards program. Any current member who refers a new qualifying individual that signs up for a membership will receive a \$100 voucher that can be used on a variety of items, including STMA merchandise, conference registration fees or membership dues. There is no limit to the number of new recruits a member can refer; he/she will receive the \$100 voucher incentive for each new person they refer who signs up.

Stay tuned for more details at [www.STMA.org](http://www.STMA.org). ■



## STMA Affiliated Chapters Contact Information

Welcome to the newly formed Indiana Chapter! The chapter is now re-established after closing in 2005. Its officers are President Joey Stevenson, Indianapolis Indians; Vice-President Clayton Dame, Goebel Soccer Complex; Secretary Andy Gossel, Covenant Christian High School; and Treasurer Evan Buckley.

**Sports Turf Managers Association of Arizona:** [www.azstma.org](http://www.azstma.org)

**Colorado Sports Turf Managers Association:** [www.cstma.org](http://www.cstma.org)

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

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

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

**Gateway Chapter Sports Turf Managers Association:** [www.gatewaystma.org](http://www.gatewaystma.org)

**Georgia Sports Turf Managers Association:** [www.gstma.org](http://www.gstma.org)

**Greater L.A. Basin Chapter of the Sports Turf Managers Association:** [www.stmalabasin.com](http://www.stmalabasin.com)

**Illinois Chapter STMA:** [www.ILSTMA.org](http://www.ILSTMA.org)

**Intermountain Chapter of the Sports Turf Managers Association:** <http://imstma.blogspot.com/>  
Indiana - [indianastma@gmail.com](mailto:indianastma@gmail.com)

**Iowa Sports Turf Managers Association:** [www.iowaturfgrass.org](http://www.iowaturfgrass.org)

**Kentucky Sports Turf Managers Association:** [www.kystma.org](http://www.kystma.org)

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

**Michigan Sports Turf Managers Association (MiSTMA):** [www.mistma.org](http://www.mistma.org)

**Minnesota Park and Sports Turf Managers Association:** [www.mpstma.org](http://www.mpstma.org)

**MO-KAN Sports Turf Managers Association:** [www.mokanstma.com](http://www.mokanstma.com)

**Nebraska Sports Turf Managers Association:** [sphillips4@unlnotes.unl.edu](mailto:sphillips4@unlnotes.unl.edu)

**New England STMA (NESTMA):** [www.nestma.org](http://www.nestma.org)

**Sports Field Managers Association of New Jersey:** [www.sfmanj.org](http://www.sfmanj.org)

**Sports Turf Managers of New York:** [www.stmony.org](http://www.stmony.org)

**North Carolina Chapter of STMA:** [www.ncsportsturf.org](http://www.ncsportsturf.org)

**Northern California STMA:** [www.norcalstma.org](http://www.norcalstma.org)

**Ohio Sports Turf Managers Association (OSTMA):** [www.ostma.org](http://www.ostma.org)

**Oklahoma Chapter STMA:** 405-744-5729; Contact: Dr. Justin Moss [okstma@gmail.com](mailto:okstma@gmail.com)

**Oregon STMA Chapter:** [www.oregonsportsturfmanagers.org](http://www.oregonsportsturfmanagers.org) [oregonstma@gmail.com](mailto:oregonstma@gmail.com)

**Ozarks STMA:** [www.ozarksstma.org](http://www.ozarksstma.org)

**Pacific Northwest Sports Turf Managers Association:** [www.pnwstma.org](http://www.pnwstma.org)

**Southern California Chapter:** [www.socialstma.com](http://www.socialstma.com)

**South Carolina Chapter of STMA:** [www.scstma.org](http://www.scstma.org)

**Tennessee Valley Sports Turf Managers Association (TVSTMA):** [www.tvstma.com](http://www.tvstma.com)

**Texas Sports Turf Managers Association:** [www.txstma.org](http://www.txstma.org)

**Virginia Sports Turf Managers Association:** [www.vstma.org](http://www.vstma.org)

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Continued from page 15

Also, remember it is one thing to germinate the overseeded grass; it is a whole other process to get it to establish enough to actually tolerate traffic and persist. You can always add a bit more seed to touch up worn/thin areas but you can never go back and regain the warmer days and longer period of sunlight that might be lost due to a late start. Some managers have used germination blankets and field covers to help later in the season but those are not ideal solutions compared to the natural growing conditions Mother Nature provides in September and early October.

Lastly, if you plan for only one seeding date, then it is advisable to make sure you seed in two directions, seeding the borders with a drop spreader (if you want a nice crisp edge) and the interior can be planted with a drop or broadcast spreader.

**TO CULTIVATE OR NOT?**

This is a highly debatable question when it comes to overseeding preparations. The research in this area is inconclusive but almost never negative in terms of overseeding success or bermudagrass survival. Remem-

ber, seed soil contact is a critical factor for success. Where excess thatch is not an issue, many turf managers have had good success with broadcasting seed and then following with moderate sand topdressing and dragging the seed/sand into the canopy with a drag implement (flexible drag, brush, etc.). Otherwise, a cultivation/coring about 2-3 weeks before the intended initial overseeding event is advisable.

**GOING BACK TO BERMUDA?**

Managers of bermudagrass fields work hard to get back to nearly 100% bermudagrass, at least for part of the summer. This will help ensure a good bermudagrass base and better overall long-term field performance. Thus, a grass species that transitions easily or the use of chemical transitioning herbicides is recommended. This topic, however, is a whole article in itself. ■

*Cale Bigelow, PhD, is an associate professor of agronomy for the Purdue University Turf Science program.*



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# Team Play



BY DR. GRADY MILLER

Professor, North Carolina State University

## Questions?

Send them to  
Grady Miller at

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Box 7620, Raleigh, NC 27695-  
7620, or email  
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Or, send your  
question to

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**T**HIS Q&A requires a prologue to introduce a great story about teamwork. It starts with Dr. Dave Minner at Iowa State getting a question (with related images) from a diagnostic lab on unusual symptoms that were seen on a bermudagrass field. He had a couple of theories but since he does not encounter bermudagrass turf as much as I do, he passed the question on to me. I had a couple of ideas as to the cause but I decided the symptoms were not the best match for validating my theories.

So I decided to share the question with Dr. Dennis Martin, professor & turfgrass extension specialist at Oklahoma State University. Dr. Martin immediately had two causal hypotheses but wanted additional information from the turf managers before coming to a single conclusion. Once the cultural conditions were reported back to him, his first hypothesis seemed to be the most appropriate, so he offered his diagnosis and treatment based on his experiences. Five professionals later (and just a few days in-between), the mystery seemed solved and a course of action recommended. That is networking and teamwork at its best.

The Question:

The attached images illustrate an issue on a bermudagrass soccer field in northeast Missouri. The grass is producing aerial growth that is tufted and showing multiple tillers. I did not find any bermudagrass mites and no evidence of disease. The field is soil based, established about 10 years ago with Quickstand bermudagrass, but has since been overseeded with some of the newer seeded varieties. Any idea at all what would cause the grass to do this?

Dr. Barb Corwin, Turfgrass Diagnostics LLC

Well, my first thought, which was also similar to Dr. Corwin's, was bermudagrass mites. I have seen my share of mite symptoms, but when I see mite activity it is normally on green, growing shoots. From the pictures it looks like the symptoms were associated only with brown tissue. So, two turf professionals thought perhaps mites, but in the back of my mind it did not seem to be the correct diagnosis.

This is when I decided to get another opinion and sent the question/images to Dr. Martin. He provided the following comments:

"Was this stand overseeded with ryegrass in fall? The reason I ask is that this unusual growth pattern on bermudagrass is often exhibited when the early season shoot growth of bermudagrass elongates above the shading canopy of the ryegrass. As such a 'palm tree like effect' can often be produced in the bermudagrass stand which eventually disappears as those early season shoots senesce or mowing height is lowered and they are cut off and removed.

"The second item to explore is mite injury. I agree with Grady's comment about often seeing a profusion of green tissue associated with mite injury. I just don't see the extreme internode stacking and shoot stunting that I generally associate with mite injury in bermudagrass. We have had a great deal of mite injury in bermudagrass this year. When drought stress strikes many of the shoots die due to disruption of the vascular system and one can see a lot of brown tufts of dead grass. In the case of the grass in these images there is just not the extreme internode stacking that I am used to seeing with mite injury so I believe we are perhaps looking more at the

former case or something else that produces symptoms consistent with those of bermudagrass competing with an overseeded ryegrass."


Dr. Martin's question about overseeding seemed important and I did not know the answer. So, I asked Dr. Corwin, who asked the field manager, and verified that the field was overseeded with perennial ryegrass in the previous fall. The ryegrass was subsequently sprayed out with Revolver herbicide in early June. The field manager also added that the area experienced a wet April and May.

---

**When drought stress strikes many of the shoots die due to disruption of the vascular system and one can see a lot of brown tufts of dead grass.**

---

The conclusion was that the case history concerning the ryegrass overseeding was very telling. While we cannot be 100% certain, the fact that ryegrass overseeding was used on that site and that the growth habit alterations were somewhat consistent with that seen at many other bermudagrass fields that were overseeded lent support to Dr. Martin's first hypothesis. Dr. Martin suggested that the sports field manager just proceed with the normal complement of management practices and continue to scout and monitor. If the theory proves to be true, no change in management practices would be necessary. ■



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