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SPORTSFIELD AND FACILITIES

MANAGEMENT

September 2014

# SportsTurf



## BMPs FOR FIELD WATER CONSERVATION

ALSO INSIDE:  
**Turfgrass maintenance math**

PLUS:  
**How one facility  
collects water**

For a few BMPs  
specific to turfgrass  
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see page 30.



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### On the cover:

The Best Management Practices (BMPs) for turfgrass water conservation can be employed by all levels, from the well trained turfgrass professional to homeowners. The BMPs are basic agronomic tools that will improve the overall health of the turfgrass plant and, in turn, will condition the grass to better withstand seasonal and prolonged drought. For a few BMPs specific to turfgrass water conservation see page 30.



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## From the Sidelines

**Eric Schroder**

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## Finally made it

**A**s long-time readers of this space might recall, I am a Penn State grad. In the late 1970's, Beaver Stadium on the east end of campus wasn't much more than a really, really big set of bleachers with (not enough) bathrooms underneath. Fast forward to last month when the Keystone Athletic Field Managers Organization set up a chance to walk the turf at Beaver Stadium as part of Penn State's Field Days. I finally stepped foot on the hallowed field, more than 35 years after I'd first seen it.

Herb Combs, CSFM, athletic field supervisor at Penn State, addressed the tour, starting with some history of maintaining the Kentucky bluegrass turf, which for many years was the prized darling of local turfgrass legend Bob Hudzik. Combs is in his 9th year at Penn State, the last 4 of which he's been in charge following Hudzik's retirement. He is responsible for more than 200 acres of grounds and fields at the University Park campus, employs seven full-time crew members, including the luxury of one full-time mechanic. There are 19 other student workers, of which 75% are normally PSU turfgrass students, who work on 20 acres of quality turfgrass, 60 acres of intramural fields, and seven synthetic surfaces.

He said only the softball field on campus was built to modern standards of athletic field construction; the current field in Beaver Stadium was built in 1960 with a gravel blanket under 18 inches of native soil, with only a steep crown for drainage. As he put it, "no fancy heating system, no fancy growing medium, no fancy drainage system." Combs said that legendary coach Joe Paterno wouldn't allow any changes to modernize the field during his long tenure at the helm, though an irrigation system was added in 2006 to replace water wheels. The field has only been re-sodded four times in the past 35 years (the end zones were resodded this year).

Combs said his is a constant learning curve regarding learning what the various coaches he

deals with want. "We keep our heads down and do we what do," he advised. "You can say 'no' three times but coaches usually eventually spin things to their advantage."

Combs credited Hudzik as being ahead of his time when many years ago he devised a "drill and fill" program in which the crew used a hand auger, yard by yard, to pull the native soil and backfill with sand to improve drainage. Combs also said the current popularity of fraze mowing, removing the top ¼ to ½ inch layer of a field to remove problematic materials, was a process begun by Hudzik in the 1980's to incorporate sand into Beaver Stadium's soil profile. With no verticutter on hand, Hudzik instead used a Jacobsen overseeder after removing the seeding equipment, leaving just the knives to disrupt the turf before putting down the sand topdressing.

The turf is mowed at 1 inch and receives 5 or 6 pounds of nitrogen a year and now features four Toro soil sensors to check moisture levels. Combs does test the Gmax hardness levels regularly to add to the more than 30 years of records that Hudzik kept on all issues relating to the field's maintenance.

Andy McNitt, PhD, the turfgrass science program coordinator, professor of soil science, and director of PSU's Center for Sports Surface Research, was on the tour and recommended to attendees that to fight layering in the rootzone, "You have to beat it up with deep verticutting and hollow tining aeration; beating it up allows the roots to grow through those layers."

McNitt and Combs also discussed watering fields, and both emphasized that stressing your grass a bit is a good thing. "You want it stemy and gnarly going into the season," McNitt said. "A bit of drought stress is okay; then you load it up again with water and let it go awhile again." ■

*Eric Schroder*

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

The Official Publication Of The Sports Turf  
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SportsTurf (ISSN 1061-687X) (USPS 000-292) (Reg. U.S. Pat. & T.M. Off.) is published monthly by Specialty Information Media at 75 Pike Street, Port Jervis, NY 12271. POSTMASTER: Send address changes to Sportsturf, PO Box 2123, Skokie, IL 60076-7823. For subscription information and requests, call Subscription Services at (847) 763-9565. Subscription rates: 1 year, \$40 US & Poss.; 2 years, \$65 US & Poss.; 1 year, \$65 Canada/Foreign Surface, 1 year, \$130 Airmail. All subscriptions are payable in advance in US funds. Send payments to Sportsturf, PO Box 2123, Skokie, IL 60076-7823. Phone: (847) 763-9565. Fax: (847) 763-9569. Single copies or back issues, \$8 each US/Canada; \$12 Foreign. Periodicals postage paid at Port Jervis, NY and additional mailing offices. COPYRIGHT 2014, SportsTurf. Material may not be reproduced or photocopied in any form without the written permission of the publisher.



# President's Message

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## We have a plan so let's use it!

I am happy to report that at the recent Board of Directors meeting we spent valuable time developing a new, 3-year strategic plan to keep STMA positioned for success. I am proud to be part of an organization that promotes its members, is forward-thinking, is not afraid to try new ideas, and is transparent. Your board represents the interests of each member category and the differing ideas and viewpoints that come together to find common ground make STMA a cut above the rest. The full strategic plan for 2015 – 2017 will be unveiled at the conference in January. See page 44 in this issue for a preview of the major platforms we will be addressing.

A recap of the 2012 -2014 strategic plan will be given later this year, and I hope you will agree that we have accomplished much for the growth and viability of the profession. You will see that we did not put a neat bow on the plan and leave it on the shelf to collect dust. The objective of a plan is to develop goals and tasks to accomplish for the overall good of the association. The same is true for plans you develop at your facility. Remember that once you have finalized a plan, you need to implement, review, update and adjust. Even though not everything that looks good on paper translates into good results, in the real world you need to keep striving to meet your goals to garner success. I am sure there are not many of us who operate without a turf management plan that must be implemented

within our resources, reviewed regularly, adjusted for use and weather, and updated to ensure it meets the needs of the turf and provides a safe surface for user groups. STMA's strategic plan is reviewed at every Board meeting and the appropriate sections are given to committees to guide their tasks.

During the planning process we recognized the need to revamp our mission statement and develop a vision statement. The mission statement tells who we are and what we do: "Professionals in sports field management and safety coupled with education, awareness and industry development." The vision statement tells where we want to be: "The recognized leader to enhance and strengthen the members and the industry."

One of our sayings here in Lexington is that poor planning on your part should not create a crisis for us. No one likes to pick up the pieces for someone else's lack of planning. Your Board and staff want to ensure you that we are doing everything to prevent you from falling into crisis mode. Our hope is that we set you up for success through networking, education and professionalism.

It is never too early to plan. Even though it is only September, here in Lexington we are already planning for next July's capital projects. We are also planning for our snow operations, but I try not to think of that just yet. One final thought to remember is that a plan is only as good as the drive to achieve it. ■



# SOME ROOM TO BREATHE: aerification is key to plant health

▲ (Photo 3)  
Core-aerification of an  
athletic field.

It's not like to think of the turfgrass plants growing on an athletic field as a crop, not unlike the potatoes that my father raised when I was a kid in southern Idaho. And just like the potatoes, the turfgrass plants need certain inputs and environmental conditions to maximize their performance.

It has long been my opinion that the long-term potential of a playing surface, and that of the turfgrass growing on it, is directly tied to the characteristics of the soil used

» The soil characteristics you need to pay particular attention to on your fields are **the soil texture, bulk density, and the effective rootzone depth.**

to construct the field. I'm not talking about the simple soil test that you might submit annually to get an idea of where you stand with regards to the status of soil pH, organic matter content, and nutrient levels. The soil characteristics you need to pay particular attention to on your fields are the soil texture, bulk density, and the effective rootzone depth. While some of these are easier to manage than others, all of them either directly or indirectly impact plant growth and the resulting quality and durability of the sports field.

Healthy turfgrass plants have actively growing rootzones that explore a large volume of the soil profile. There are a number of things that can reduce the rooting depth of turfgrass plants. For example, maintaining a turfgrass plant at a height of cut that is below its adapted range will result in reduced rooting depth as



will the development of compacted layers within the soil profile. Any reduction in rooting depth will decrease the water and nutrient uptake of the plants, which ultimately has a negative impact on plant growth. Given the intense use of most athletic fields, this is obviously a situation we want to avoid.

There has been a significant amount of work done to determine the ideal range of soil textures for use on athletic fields with recommendations often varying slightly depending on geographic location and intended use. I'm not going to get into that here. Chances are that you do not have the luxury of choosing the soil texture of the fields you are managing unless you are lucky enough to be involved in a new construction project or a significant renovation. That being said, I still feel it is important that you have a good understanding of where your fields stand with regard to soil texture. In most cases it will not be necessary to submit samples for textural analysis. However, it would be good to pull some soil cores to depth of 10 to 12 inches from a few random locations in each field to get a better idea of what you are dealing with, particularly if your field was constructed using native materials.

Pay particular attention to the consistency of soil texture from top to bottom of each core and from one location to the next. While you will expect some variability from one location to the next, particularly with a native soil field, you want to see a consistent soil texture throughout the depth of the soil cores (**photo 1**). Note any changes in soil texture as they can lead to problems with water infiltration and root growth.

Abrupt changes in soil texture in the soil profile, often referred to as layering, can impede water movement through the profile leading to the surface staying wet longer after rainfall and irrigation events (**photo 2**). If the soil surface is at or near saturation while being used, the field will wear out more quickly. To make matters worse, the water in a soil at or near saturation acts as a lubricant for the soil particles allowing them to slip past each other more easily leading to increased compaction (bulk density) of the soil.

As bulk density in the soil increases it becomes more difficult for plant roots to penetrate the soil leading to a reduction in water and nutrient uptake. In extreme cases, soil compaction can result in surface hardness (Gmax) levels that increase the risk of impact injuries to athletes using the field. For example, the Clegg Impact Tester is used to monitor surface hardness on all NFL fields. The NFL has established a maximum threshold value of 100 Gmax for all natural and synthetic fields.

Given the intense use that most athletic fields receive, effective management of soil compaction on athletic fields is just as important as a well-developed fertility program.

Once you have a good understanding of the soil conditions you are dealing with on your fields you can begin to develop an aerification program to address any problems that exist. In general, aerification practices should be conducted on actively growing stands of turfgrass. For cool-season areas you can begin a heavy core aerification program in the spring before the first fertilization followed by light coring/pencil tining during the summer months when the grasses are under more stress and more aggressive aerification again in the fall.

Aerification of warm-season grasses should not begin until late spring or early summer once the grasses are growing vigorously. In both cases, high traffic areas should be cultivated 6-8 times a year at a minimum to maximize plant health.



▲ **Left (Photo 1)** A soil core removed from an athletic field built with a sand-based rootzone. Note the consistent texture throughout the depth of the core, lack of any compacted layers and minimal organic matter accumulation at the surface.

**Right (Photo 2)** A soil core removed from an athletic field depicting the layering of different soil types. At the bottom of the core there is a fine-textured soil that is high in clay, above that there is a 4-inch layer of sand that has been topped with an additional 3 inches of fine-textured topsoil.



There are a number of different types of equipment available that can be incorporated into an aerification program and depending on your specific circumstances you might find that you need to use more than one on a regular basis.

### CORE AERIFICATION

This is arguably one of the most well-known and least appreciated approaches to maintaining high quality playing fields. Core aerification removes cores of soil from the profile to a depth of 4-6 inches using hollow-tines (**photo 3, on page 8**). There are two primary types of core-aerification: drum type and cam driven. Both come in various sizes ranging from small walk-behind units to self-propelled rider-operated units and larger tractor mounted units that attach to the three-point hitch. Drum-type aerators are less expensive and require less maintenance when compared to the cam-driven units. However, the cam-driven units have an advantage in that they cause minimal surface disruption while achieving deeper tine penetration. The cam-driven units are also capable of much closer spacing of the holes which allows for more aggressive management of compacted soils (**photo 4**). Tine diameters for core aerators range from  $\frac{1}{4}$  to  $\frac{3}{4}$  inch in diameter. Larger tines will remove more soil and will have the largest impact on alleviating compaction. It is important to note that using large diameter tines on athletic fields, particularly at close spacing, is not recommended during times of active use due to the risk of reduced footing stability for the athletes.



▲ (**Photo 4**) Surface view of field following core-aerification. Note the holes where soil cores have been brought to the surface to alleviate soil compaction.



▲ (**Photo 5**) Slicer mounted to the front of a utility vehicle.

### SOLID-TINE CULTIVATION

Also known as pencil-tining, solid-tine cultivation is an important management tool for use during the playing season in lieu of core aerification. Using the same cam-driven equipment that is used for core-aerification, solid-tine cultivation involves the use of small diameter ( $\frac{1}{4}$ -inch) tines set to penetrate the soil in a very closely-spaced pattern. By using solid tines on your high-traffic areas during the season you can improve root health by temporarily relieving compaction while causing minimal disruption to the surface. Solid-tine aerification is not a replacement for core aerification in your overall management program.

### DEEP-TINE CULTIVATION

This approach to compaction management uses large diameter tines ( $\frac{3}{4}$ -inch) that penetrate the soil to a depth of 8-1 inches. Many manufacturers design their deep-tine cultivators in such a way that they cause fracturing (shattering) of compacted layers in the soil profile upon entry/exit of the tines. This is a great tool to use two or three times a year on fields receiving extensive use.

### SLICING/SPIKING

This process involves the use of narrow elongated blades mounted to a drum and rolled across the surface of the field (**photo 5**). This causes minimal damage to the surface, stimulates plant growth and improves gas exchange with the rootzone. While this will not improve soil compaction it is a very impor-



tant tool for improving plant health and should be used as often as possible.

### DEEP DRILLING/DRILL-AND-FILL

Deep drill and drill-and-fill machines use a series of drill bits arranged in a grid to penetrate the soil to a depth of 10-12 inches. In many cases, this equipment allows turf managers to penetrate compacted layers that might exist deeper in the profile to improve subsurface drainage. Drill-and-fill machines have the added benefit of allowing turfgrass managers the option of filling the holes back with a soil amendment of their choice. In poorly drained soils and soils that with abrupt changes in soil texture within the profile it is common to fill the holes back with a coarse sand to improve infiltration rates. The primary disadvantage of these systems, if it is to be considered one, is that they are very slow taking 12 or more hours to cover an acre.

### HIGH PRESSURE WATER INJECTION

These systems use high-pressure water that is directed through small-diameter nozzles in short bursts as the unit travels across the field. These short bursts of water can penetrate the soil to a depth of 6-8 inches depending on soil conditions. In at least one case, the equipment is designed to facilitate back-filling the holes with sand

or other soil amendments. The primary benefit of high-pressure water injection systems is that they cause (almost) no visible damage to the playing surface and can be used all season long while the fields are active.

Regardless of which piece of equipment you plan to use, it is a good idea to make sure that the field is not too wet or dry before implementing your cultivation practices. Irrigate the field 12 to 24 hours before you plan to begin your work to ensure adequate soil moisture for proper penetration by the cultivation equipment while minimizing the risk of additional compaction developing as a result of your efforts.

No one piece of equipment will address each and every soil management issue that you might come across while managing your fields. It is my opinion that at a bare minimum, you should have ready access to a slicer and cam-driven core-aerator complete with sets of both hollow core and solid tines to use regularly for managing soil compaction on your fields. ■

*Dr. Jason Kruse is an associate professor of turfgrass science in the Environmental Horticulture department at the University of Florida and serves as Undergraduate Coordinator for the Plant Science degree program.*



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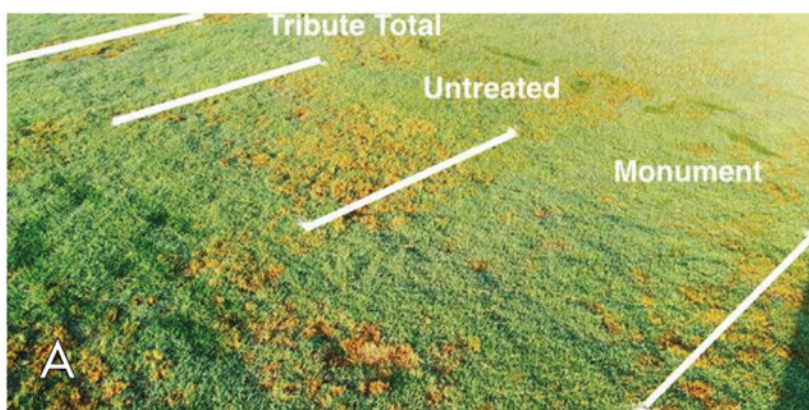
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# MANAGING WINTER ANNUAL WEEDS

## Traffic Increases Susceptibility to Weed Invasion



**W**inter annual weeds such as annual bluegrass (*Poa annua*), henbit (*Lamium amplexicaule*) and common chickweed (*Stellaria media*)

often invade cool and warm-season athletic fields subjected to traffic from fall sports such as football and soccer. Traffic can weaken both warm- and cool-season turfgrass athletic fields leaving voids in the canopy for winter annual weeds to invade.

Winter annual weeds will often become established in the most heavily trafficked portions of an athletic field during late fall and early spring once fall sports are complete and turfgrasses are less competitive. In a study conducted during the winter of 2013-2014, plots receiving simulated football traffic in fall contained 35 annual bluegrass plants per 9 ft<sup>2</sup> compared to less than 2 plants per 9 ft<sup>2</sup> those not receiving traffic (**Figure 1**).

Controlling these weeds is essential to maximizing both field safety and playability. Research at the University of Tennessee has found that the presence of weeds on athletic fields can reduce traffic tolerance potentially leading to greater injuries. Additionally, failure to remove winter annual weeds will allow them to persist with desirable turf the following growing season (**Figure 2**); which negatively affects field playability and safety as well. To that end, it is important to develop a plan for managing winter annual weeds on athletic field turf.

## COOL-SEASON ATHLETIC FIELDS

On many cool-season athletic fields, annual bluegrass is a year round problem rather than something that is seasonally troublesome. Seedhead production

◀ **Figure 1. Top Left: Annual bluegrass** invading trafficked hybrid bermudagrass turf. Few weeds are present in non-trafficked turf.

**Figure 2. Non-competitive hybrid bermudagrass growth** following use of POST herbicides for annual bluegrass control (A). Additionally, clumps of ryegrass competing with bermudagrass growth on a high school football field (B).



# THE PROVERBIAL "BIG STICK."

and deposition into the soil profile ensures that annual bluegrass will be a perennial problem on these fields. For example, researchers have reported that annual bluegrass deposits nearly 2 million seeds per ft<sup>2</sup> (185,000 seeds per m<sup>2</sup>) in the top inch of soil. In these instances, climatic conditions usually favor annual bluegrass seed germination and growth for large portions of a calendar year making permanent control with herbicides difficult.

Many field managers have had success managing annual bluegrass with applications of Tenacity (active ingredient is mesotrione). Tenacity is a carotenoid inhibiting herbicide that turns susceptible weeds white after application (**Figure 3**). Researchers have observed that sequential applications of Tenacity in the fall can remove annual bluegrass from Kentucky bluegrass (*Poa pratensis*); however, responses may vary with location, year, or annual bluegrass biotype. Individuals managing fields with high percentages of perennial ryegrass (*Lolium perenne*) will need to reduce application rates because this species is less tolerant of Tenacity than Kentucky bluegrass.

In addition to having activity on annual bluegrass, Tenacity can be used to control several winter annual broadleaf weeds, including common chickweed, henbit, and lawn burweed (*Soliva sessilis*) either pre- or postemergence. Label directions allow for Tenacity to be applied for weed control on fields before being re-seeded or sodded as well. However, applications after seeding should be delayed a minimum of 4 weeks or until newly germinated turf has been mowed twice.

Xonerate (active ingredient is amicarbazone) is a new herbicide labeled for use on many mature warm- and cool-season turfgrasses that has efficacy for annual bluegrass control on golf course turf with sequential applications. Despite significant interest among athletic field managers, Xonerate use on cool-season fields is limited because current labeling does not allow fall applications due

▼ **Figure 3. Annual bluegrass bleaching** after treatment with Tenacity



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to injury to desirable turf. Additionally, applications in spring must be made before air temperatures reach 85°F. Moreover, applications to Kentucky bluegrass must be delayed a minimum of 12 months after seeding. Research trials have shown some benefit to tank mixing Tenacity and Xonerate for annual bluegrass control in cool-season turfgrass; however, more information is needed before this mixture becomes a labeled option that athletic field managers can legally apply to their turf. At the current time, the best use of Xonerate on athletic field turf is for annual bluegrass control on warm-season fields overseeded with perennial ryegrass for spring football and baseball.

Pylex (active ingredient is topramezone) is a new herbicide for use in turfgrass that is also safe for use on many cool-season turfgrasses including Kentucky bluegrass, perennial ryegrass, and tall fescue (*Festuca arundinacea*). Pylex works similar to Tenacity in that it inhibits carotenoid production, turning susceptible weeds white after application. Pylex is an option for postemergence weed control in established turf and can also be used when establishing new cool-season turfgrass stands from seed. However, applications after seeding should be delayed a minimum of 4 weeks. Although Pylex has **no activity** on annual bluegrass, it can be used to select winter annual broadleaf weeds such as common chickweed, speedwell species, Shepherd's-purse, hairy bittercress, and henbit.

Drive XLR8 (active ingredient is quinclorac) is often thought of as an herbicide for postemergence crabgrass control. Many athletic field managers are unaware that Drive XLR8 controls a wide spectrum of broadleaf weeds including many winter annual species. Drive XLR8 is also safe for use during the establishment of cool-season species used on athletic fields. Applications to newly seeded Kentucky bluegrass can be made 4 weeks after seeding; on perennial ryegrass, Drive XLR8 can be applied at seeding and 4 weeks thereafter as well.

Athletic field managers should be advised that many products containing quinclorac are available under different trade names. Always check the product label to determine if a particular herbicide can be applied to newly established turf. For example, SquareOne Herbicide (active ingredients are quinclorac + carfentrazone) can be applied to Kentucky bluegrass and perennial ryegrass 7 days after emergence. Comparatively, applications of Q4-Plus (active ingredients are quinclorac + sulfentrazone + 2,4-D + dicamba) must be delayed until at least 28 days after emergence.

## WARM-SEASON ATHLETIC FIELDS

Winter annual weed management is a critical issue on warm-season athletic fields. As temperatures cool throughout fall and winter, warm-season turfgrasses grow less aggressively and often enter dormancy in many locations. This renders warm-season athletic fields non-competitive against winter annual weed invasion.

There are several factors that make winter annual weed management on warm-season athletic fields complicated including decisions regarding overseeding and managing the evolution of herbicide resistant weeds.

*Overseeded Fields.* Many warm-season athletic field managers

chose to overseed fields with cool-season species such as perennial ryegrass during fall. This practice ensures that fields will remain green throughout the winter and early spring, which can be important for sports like baseball that often begin early in the calendar throughout much of the southern United States. It also serves to protect dormant bermudagrass crowns from the negative effects of foot traffic during dormancy. However, inputs of irrigation water and fertilizer nutrients required to establish a successful stand of overseeded turf on warm-season athletic fields can encourage invasion of winter annual weeds, particularly annual bluegrass. Much like controlling the winter annual weeds; overseeded perennial ryegrass must be removed in the spring for warm-season turfgrasses to recuperate.

One option for annual bluegrass management in these scenarios is to apply a preemergence herbicide like Barricade (active ingredient is prodiamine) 8 to 10 weeks before overseeding. However, in most climates annual bluegrass pressure will likely be quite low during this 8 to 10 week period before fall overseeding. Additionally, this practice may not provide complete control in most environments because multiple flushes of annual bluegrass germination can occur throughout the fall.

Another option is to apply an acetolactate synthase (ALS) inhibiting herbicide such as Revolver (active ingredient is foramsulfuron), Monument (active ingredient is trifloxysulfuron), or Katana (active ingredient is flazasulfuron) closer to overseeding. These herbicides can safely be applied 7 to 28 days before overseeding species such as perennial ryegrass into bermudagrass athletic fields. Be advised that re-seeding intervals vary by product and field managers should consult the herbicide label for more specific information. Applications of ALS inhibiting herbicides will control any annual bluegrass plants that may have emerged before overseeding and provide some residual control of those germinating thereafter.

Some field managers chose to follow-up these applications with postemergence treatments after overseeding. As previously mentioned, Xonerate is a new herbicide that fits this use pattern. Prograss (active ingredient is ethofumesate) is labeled for postemergence annual bluegrass control in overseeded perennial ryegrass turf on



▲ **Figure 4. Many warm-season athletic fields** are not overseeded during the winter and enter full dormancy.



golf courses. Applications are usually made once the overseeded stand has emerged to a height greater than 1 inch and has been mowed at least a single time. Research trials have found that sequential applications of Prograss at this timing in Tennessee effectively control annual bluegrass in overseeded perennial ryegrass fairways. However, Prograss is for use by professional applicators only and does not have specific labeling for use on athletic fields.

**Non-Overseeded Fields.** Many facilities do not have the resources to overseed their warm-season athletic fields and turf remains dormant throughout the winter and mid-spring (**Figure 4**). In these situations, pre- and postemergence herbicides can be used to manage winter annual weed infestations.

There are numerous preemergence herbicide options for controlling annual bluegrass and other winter annual weeds on non-overseeded bermudagrass including: Pendulum AquaCap (active ingredient is pendimethalin), Barricade (active ingredient is prodiamine), Dimension (active ingredient is dithiopyr), Echelon (active ingredients are prodiamine + sulfentrazone), Specticle Flo (active ingredient is indaziflam), Ronstar (active ingredient is oxadiazon), and Princep (active ingredient is simazine). Most of these herbicides are applied in early fall to provide residual control of annual bluegrass plants not yet emerged from soil for several weeks after application. Specticle Flo, Echelon, and Princep can be applied later in the fall

to control newly emerged annual bluegrass plants in addition to offering residual control of plants that have not emerged from soil. Consult a local Extension specialist for specific information about best application rates and timings for these herbicides.

Concerns over traffic tolerance and recovery often result in many athletic field managers avoiding use of preemergence products in fall when fields are subjected to traffic. As a result, postemergence herbicide applications for winter annual weed control are more common on athletic fields. ALS inhibiting herbicides such as Revolver (active ingredient is foramsulfuron), Monument (active ingredient is trifloxysulfuron), or Tribute Total (active ingredients are thien-carbazone + foramsulfuron + halosulfuron) are often applied in spring once turf begins actively growing. Katana (active ingredient is flazasulfuron) is another ALS inhibitor that can also be used for annual bluegrass control in spring if applied following an application of quickly available nitrogen fertilizer at greater than 0.5 lb N/1000 ft<sup>2</sup>. ALS inhibiting herbicides can be used at low application rates to control annual bluegrass and a wide spectrum of winter annual broadleaf weeds when soil temperatures exceed 60°F. They are commonly applied with non-ionic surfactants at a 0.25% v/v ratio to improve performance.

A common practice in the transition zone is to treat dormant bermudagrass athletic fields with applications of the non-selective

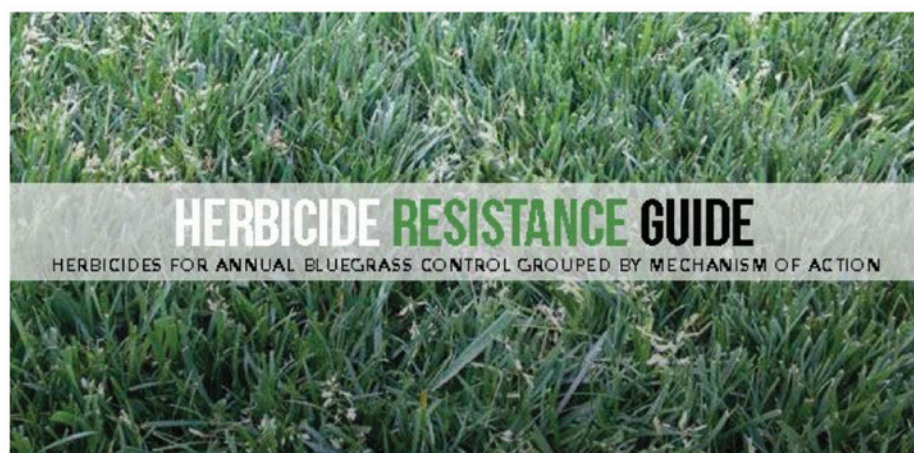
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TIMING	ACTION	ACTIVE INGREDIENT*
Pre/Post	Mitotic inhibition	Dimethenamid (Tower**)
		Pronamide (Kerb)
	Photosystem II inhibition	Amicarbazone (Xonerate)
		Atrazine (Aatrex)
		Metribuzin (Sencor)
		Simazine (Princep)
	Cellulose biosynthesis inhibition	Indaziflam (Specticle)
	Lipid biosynthesis inhibition	Ethofumesate (Prograss)
	Carotenoid biosynthesis inhibition	Mesotrione (Tenacity)
	Protoporphyrinogen oxidase (PPO) inhibition	Flumioxazin (SureGuard)

▲ Figure 5. University of Tennessee, for selecting herbicides for annual bluegrass control.

herbicide Roundup Pro (active ingredient is glyphosate) to control annual bluegrass and other winter annual weeds. Roundup Pro is labeled for use on dormant bermudagrass turf at rates of 5 to 44 fl oz/A and provides a more economical alternative to many of the ALS inhibitors. Applications must be made to **completely dormant** turf (i.e., no green leaves or stolons present) early in the year at air temperatures > 50F. Be advised that applications under cooler conditions will not be as effective and those made to partially dormant turf can severely stunt spring green-up. Other non-selective herbicides that fit this use pattern include Finale (active ingredient is glufosinate) and Reward (active ingredient is diquat). Be advised that burndown products such as Reward may require sequential applications to provide acceptable control.

**Herbicide Resistance.** A major factor complicating programs for managing winter annual weeds (particularly annual bluegrass) in warm-season climates is the increasing incidence of weeds exhibiting herbicidal resistance. Weeds are deemed “herbicide resistant” when they are no longer controlled by a rate of a particular herbicide that was once normally effective. Over the past several years there have been first reports of annual bluegrass populations developing resistance to commonly used herbicides including Barricade, Monument, Revolver, Princep, and Roundup. In nearly all of these cases, resis-

tance developed as the result of using the same herbicide for a series of consecutive years without rotation. This all-to-common process essentially removes annual bluegrass plants that are sensitive to a particular herbicide and selects for those with some inherit level of resistance. Recently, populations of annual bluegrass with resistance to multiple herbicidal modes of action have been identified in the south-eastern United States.

An increase in herbicide resistant annual bluegrass will result in field managers having fewer herbicide options for annual bluegrass control. Several turf managers are already struggling with the stark reality that resistance brings to light. Imagine annual bluegrass that could not be controlled with Revolver, Monument, or Princep. What about annual bluegrass that remained on dormant bermudagrass fields after an application of Roundup? Continued use of the same weed management strategy for multiple years will eventually lead to this result at some point in time. It is critical that field managers diversify their strategies for annual bluegrass control now and rotate their approach regularly. The University of Tennessee has developed a guide to assist field

managers in rotating herbicides for annual bluegrass control in an effort to reduce the rate at which herbicide resistance in turf has been increasing. This document essentially groups products for annual bluegrass based on optimal application timing (i.e., pre- or postemergence) and color codes herbicides by their mode of action (Figure 5).

Winter annual weed management is an important issue for individuals managing both cool- and warm-season athletic fields. Failure to control winter annual weeds can negatively affect field safety and playability. Winter annual weeds left uncontrolled often can persist into the following season, competing against desirable turf for valuable water, light, and nutrient resources. It is critical that field managers developing a plan for managing winter annual weeds and commit to rotating their approach regularly to mitigate to the development of herbicide resistant weeds. ■

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# John Mascaro's Photo Quiz

John Mascaro is President of Turf-Tec International

*Can you identify this sports turf problem?*

**Problem:** Dark green lines on turf

**Turfgrass area:** Golf tee box

**Location:** Overland Park, Kansas

**Grass Variety:** Bentgrass

**Answer to John Mascaro's Photo Quiz on Page 23**



Background illustration courtesy of istockphoto.com

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# HOW TO AVOID THE FIELD WORK DAY BEFORE NEXT SEASON

▲ **Turfplaning the outfield** at the University of South Alabama, Mobile. The turfgrass manager is Zach Willard.

**A**s we all realize, maintaining athletic fields and facilities can be a year round job for the coaches, groundskeeper, booster clubs, maintenance staff, etc. So often we hear of coaches setting a work day in January for “all hands on deck” and a long 12-hour or more day is spent edging, painting, cleaning bathrooms, concession stand etc. Here we will hopefully give you some ideas that can be put in place throughout the year that will help you avoid this on a cold, cloudy, dreary January day.

Typically, in most sports, there is some down time for the field. With travel ball, select tournaments and various leagues throughout the country, finding the down time is important and must be scheduled just like the weekend tournaments. Coaches and players might not like having access to the fields, but, if they realize that this is to keep them safe and playable, then it is easier for them to understand.

For timing purposes, we will use the baseball/softball season for colleges/high schools/parks and recreation (typically January 1 through June 30 in the South). As you are reading this, you might think “That doesn’t happen at my location,” but, with some planning, you can apply these field maintenance practices into your schedule.

## JULY

The main focus during this time is your turf health. You want to aerify your fields as soon as possible to help reduce

the compaction from the season and aerifying will create space for the nutrients, water and oxygen to reach the roots to stimulate plant growth. Ideally, you will aerify in two directions immediately after the season to give your turf the most time to recover and become healthy.

Along with aerifying, you need to topdress with sand (USGA is recommended), but, if budget or availability is a problem, you can use washed, slightly coarser sand. Try to find sand that is free of debris and rocks. After aerifying in two directions, apply a heavy layer of sand up to ¼ inch, then mat drag the field to allow the sand to help fill the space created.

Other things to consider could be: vertically mowing, replacing sod, turfplaning, sand surface leveling of your fields or major renovation projects.

## AUGUST

August is a great month to add infield mix to your skinned areas. The weather is warm and drier and therefore infield material will be much easier to work. We will save the discussion for what type of infield mix to use for another day, but, basically the areas you need to address will be: Low spots on your infield; the edges of your grass and skinned infield; baselines; mounds; home plate area holding water in the batters boxes; and bullpen mounds. With the infield and mound work, it is much easier to complete this time of year and will allow for the material to settle and be ready for the season in January. Try to



have your on-field work completed this month before you overseed your field so you won't be driving over your field.

## SEPTEMBER

Overseeding is the next step in your process getting ready for the season. A few things to remember and check before you begin your overseeding: Irrigation is key to establishing a great stand of your overseed variety. We recommend taking time about 2 weeks before overseeding to check your system. Monitor all irrigation heads making sure they are rotating properly and getting adequate coverage (head to head). If not, replace or repair at once. By making sure the irrigation is in proper order, it helps with your overseed establishment. Once your irrigation system is working, the next step will be to prepare your field for the seed.

Remove most of the grass on your field by lowering your cutting height while trying to avoid scalping the grass. You will need to remove the excess clippings by sweeping your field to get it clean. Once clean, you can then overseed your fields. Ideally you want to use a drop spreader around the edges (infield, plate, baselines, warning track, etc.) so that you don't spread seed where you don't want it. The drop spreader can be used on the infield and lip areas; make sure you go in two directions with the seed.

For the outfield, you can use a walk-behind rotary spreader or a machine-mounted spreader, also going in two directions. Once you overseed, keep the seed moist until it germinates and then start backing off the water to help the roots establish. If your budget allows, you can add a starter fertilizer approximately 7-10 days after overseeding. We recommend waiting until you see the grass start to push up out of the ground before fertilizing so that the plant can use the nutrients available.

## OCTOBER-NOVEMBER

If you didn't get all your clay work completed in August, now is the time to finish it and fine-tune your field. You want to minimize the traffic on your field so that the newly planted overseed won't be damaged and the field will be in great shape for the season. This is a great time to pull out your screens, nets, backstop padding, rail padding, tarps (mound/plate/bullpen), infield protectors, windscreen, etc. You will want to check for holes, tears, rips, etc that might have happened during the off-season. Repair or replace these items now and have them ready for the season in November. As with most items, once the season gets closer, manufacturers get busy and the timeframe is longer to get that replacement. Avoid the rush and shop early for items needed in January!

## DECEMBER

Time will move quickly from Thanksgiving to Christmas to New Year's. With the downtime and getting ready for holidays, it is a great time for you to pull soil samples and get them to the lab for analysis. You will want to do this about the same time every year that will help you with your planning for the following year. Soil reports give you the necessary information—the good and the bad. The report allows you to target the areas that are deficient in nutrients. By having this



▲ **Hoover Met Field** overseeded for Hoover High School football. Sam King is the turfgrass manager.



▲ **Left: Leveling home plate** with mound clay at Stone County High School, Wiggins, MS. Field maintained by head coach Hayden Cox. **Right: Adding clay** to the Pensacola Blue Wahoos Field, Pensacola, FL, where Ray Sayre is head groundskeeper.

at the first of the year, it allows you to create a game plan on how to attack your fertilization needs going into the spring. This allows your turfgrass every opportunity to be healthy and grow.

Yearly equipment maintenance and repair can also be on the list of things to do in December. Some things to make sure happen are: sharpen bed knives, grind reels, change oil and fuel filters, replace batteries, make sure tires are in good shape, and repair any hydraulic leaks, worn hoses, etc. Have your equipment ready for the season means one less headache to deal with in January.

## JANUARY

Final step is to add your conditioner to the skinned areas. You want to put your conditioner out before you do anything on your field. If you have the December camp and you plan for infield/outfield, then adjust your timeframe and have the conditioner on the field before players are there. The last thing you want to do is to have your field looking great and a 1-day hitting/fielding camp ruin your hard work.

As with most schedules, they can and probably will be adjusted. Take the time to plan ahead. January is a great time to create a yearlong calendar for the field and begin documenting what you do to your field. By doing this, it will allow you to plan for the next year and begin a yearly maintenance/checklist and will help you avoid the "all hands on deck" field day in January. Have a great fall and we'll see you in Denver at the STMA Conference. ■

*Bill Marbet is president of Southern Athletic Fields, Inc.; Glenn Lucas is a sales representative for SAF in the South Alabama, South Mississippi and Louisiana, [www.safdirt.com](http://www.safdirt.com).*



# TURFGRASS MANAGEMENT MATHEMATICS

**R**ecently I returned to the home farm near Cameron, WI where I grew up. We were going to move the last things out of our farmhouse so it could be sold. In amongst the books in the attic was a small thin book called Arithmetic in

Agriculture that must have belonged to my father when he as a student in Dairy Science at UW-Madison in the 50's. On the third page of the book, which was copyright 1951, was a picture of a young farmer in bib overalls sitting at a desk with pencil and notebook. The caption read, "Arithmetic will help you solve many farm problems." Think of this for a minute; the problems in this book were meant to be worked out without a calculator, or a smartphone, or calling a friend who is good at math. A slide rule might be helpful; raise your hand if you can work a slide rule! What a great time we live in, because all these tools are available to use today, although phone a friend is a last resort.

A firm grasp of mathematics is also vital for a turfgrass manager. If you make a math mistake you will waste time and money and eventually kill grass. Mathematics allows us to calculate how much of an input to apply, calculate the cost of different applications and determine how many workers or man hours to allow for a project. It is never a bad idea to review and sharpen our mathematical skills and this article is intended to do that. Let's review some principles before we do some calculations.

## SIGNIFICANT FIGURES AND PRECISION

How accurate do our calculations have to be? It depends on the situation. If we apply a 2x rate of sand topdressing to a field we will not even notice, but a 2x rate of metribuzin and we may be looking at some dead turf. In general, we match the precision of measuring the material to the amount that is going to be applied. We handle sand topdressing with tractor scoops and topdressers and in most cases two significant figures are all that are needed. A typical  $\pi$  inch topdressing application applies 33 yd<sup>3</sup> tons per acre. The 33 represents two significant figures. An application of ammonium nitrate (34-0-0) equivalent to 1 lb N/1000 ft<sup>2</sup> to the playing surface of a football field would require 169.4 lbs. Do we need this kind of accuracy? Four significant figures? No, in this case we can still use two significant figures and round this number up to 170 lbs.

What if we are making an application of MSM Turf to control wild garlic on the same football field? Using the 0.5 oz per 1000 ft<sup>2</sup> rate this application would take 28.8 oz of product and in this instance we can again use two significant figures and round this number to 29 oz. In the case of smaller areas or products with very small use rates three significant figures may be warranted.

## A POWERFUL TOOL

One of the most useful and powerful tools that is commonly used on turfgrass math is the equation of ratios. In many cases we have determined or been given the rate we need for a set area such as 5 oz of product/1000 ft<sup>2</sup> or 2 lbs of product per acre. We know the area over which we will be applying our product and now we must determine how much of the product to apply. For example, the label on kwiksorb wetting agent says to apply 5 fl oz of product per 1000 ft<sup>2</sup> or 218 fl oz/acre. We want to apply this to the playing surface of our sand-based football field that measures 360 ft x 160 ft or 57,600 ft<sup>2</sup>. To solve this we set up the following:

$$\frac{5 \text{ fl oz}}{1000 \text{ ft}^2} = \frac{x \text{ fl oz}}{57,600 \text{ ft}^2}$$

In this case our units also align so we do not have to do any conversions at this point. To solve the problem we cross multiply and divide.

$$\frac{5 \text{ fl oz} \times 57,600 \text{ ft}^2}{1000 \text{ ft}^2} = 288 \text{ oz of kwiksorb}$$

We could also use the rate for an acre (43,560 ft<sup>2</sup>) which is 218 fl oz

$$\frac{218 \text{ fl oz} \times 57,600 \text{ ft}^2}{43,560 \text{ ft}^2} = 288 \text{ oz of kwiksorb}$$

In equal ratios the product of the means is equal to the product of the extremes. What does this mean? Let's write the equation a little different.  $218 \text{ fl oz}/43,560 = 288 \text{ fl oz}/57,600$



ft<sup>2</sup>. The extreme values in this case are the ones on the outside of the equation and the means are those near the = sign. And 218 fl oz x 57,600 ft<sup>2</sup> does equal 43,560 ft<sup>2</sup> x 288 fl oz. (If you multiply these out there is a small discrepancy due to rounding.)

One of the most important calculations a turfgrass manager makes is the determination of how much of an input to apply to an area of turfgrass. Every calculation of this type comes down to the same principle applying an amount of a product over an area. Most discussions of turfgrass mathematics spend some time discussing the determination of areas of different shapes and even how to determine the areas of oddly shaped features such as golf greens and sand bunkers. When I think of athletic fields I don't see many of these odd shapes but mostly rectangles and quarter circle arcs of baseball and softball diamonds. For the rectangular shapes the areas are easily determined by multiplying the length by the width. Most field managers know the length and widths of their fields because at some point they have pulled a tape and measured them. With today's technology it is also fairly easy to determine areas of fields using smart phone apps such as Measure My Land, Planimeter, or Google Earth.

Nearly every product we apply to turfgrass is not in a pure form so we must determine application rates to allow for this. For example, if we are applying 21-0-0 fertilizer it only contains 21% N so even though we have applied 100 lbs. of product we have only applied 21 lbs. of N. Two applications that apply a product in a pure form are topdressing and irrigation. We will begin with some examples of those applications.

Example: How much sand topdressing is required to apply 1/4th inch of topdressing to an area of soccer fields that is 250 yards long and 75 yards wide?

A topdressing layer can be visualized as long, wide, and thin box; in this case 250 yards long, 75 yards wide and 1/4th inch thick. We have units of yards and inches so we need to convert the inches into yards.

$$\frac{1}{4} \text{ inch} \times \frac{1 \text{ yd}}{36 \text{ inches}} = 0.00694 \text{ yds}$$

$$250 \text{ yds} \times 75 \text{ yds} \times 0.00694 \text{ yds} = 130 \text{ cubic yds}$$

So we will need 130 cubic yards of sand for this application. Our sand supplier sells sand by the ton and a cubic yard of dry sand weighs 2700 lbs.

$$130 \text{ yd}^3 \times \frac{2700 \text{ lbs}}{\text{yd}^3} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = 176 \text{ tons}$$

Now the sand is probably not totally dry depending on the weather. If I were buying sand for this application I would buy 15% extra to allow for this water.

$$176 \text{ tons} + (15 \% \times 176 \text{ tons}) = 202 \text{ tons of sand}$$

So for this application I would order 202 tons of sand.

Example: How much water is needed to apply 1 inch of irrigation

to a football field with the dimensions 130 yds by 70 yds? In this case it may be easier to work in cubic feet.

$$130 \text{ yds} \times \frac{3 \text{ ft}}{\text{yd}} \times 70 \text{ yds} \times \frac{3 \text{ ft}}{\text{yd}} \times 1 \text{ in.} \times \frac{\text{ft}}{12 \text{ in.}}$$

$$= 6,800 \text{ ft}^3 \times 7.5 \frac{\text{gallons}}{\text{ft}^3} = 51,000 \text{ gallons}$$

Or we could do an internet search and ask "How many gallons are in an acre inch of water?"

Answer 27,152 gallons. The problem now is an equation of ratios.

$$130 \text{ yds} \times \frac{3 \text{ ft}}{\text{yd}} \times 70 \text{ yds} \times \frac{3 \text{ ft}}{\text{yd}} = 81,900 \text{ ft}^2$$

$$\text{so } \frac{27,152 \text{ gal}}{43,560 \text{ ft}^2} = \frac{x \text{ gal}}{81,900 \text{ ft}^2}$$

Solving for x we get 51,000 gallons.

Sand and water are some of the commodities that are "pure" in that they contain 100% of their ingredient.

## CHEMICAL APPLICATIONS

With the exception of fertilizer, all of our chemical applications that are sprayed or spread on turfgrass almost always come with a label that gives us a rate of product to use per area of turfgrass.

Example: We have an adult softball 4-plex with full skin infields, 65 ft bases and 275 ft to centerfield. Each field has 61,450 ft<sup>2</sup> of grass area. Each field is grassed with MS-Pride bermudagrass and we need to apply Primo-MAXX to tighten up our canopy and cut down on our mowing. We are treating 61,450 ft<sup>2</sup> x 4 = 245,800 ft<sup>2</sup> of grass area. The rate of Primo Maxx for athletic field height (1/2 inch) hybrid bermudagrass is 11 oz per acre.

$$\frac{11 \text{ fl oz}}{43,560 \text{ ft}^2} = \frac{x \text{ fl oz}}{245,800 \text{ ft}^2} = \frac{11 \text{ fl oz} \times 245,800 \text{ ft}^2}{43,560 \text{ ft}^2}$$

$$= 62 \text{ fl oz Primo Maxx}$$

## FERTILIZER APPLICATIONS

Fertilizers are a bit different than other chemical applications in that they are made in response to a soil test or fertility plan, and we must take into account the percent element of interest (usually N) in the fertilizer.

For example we have 233,000 ft<sup>2</sup> of bermudagrass soccer fields on soils modified with shallow sand cap. Our fertility plan calls for 1.5 lbs of N per 1000 ft<sup>2</sup> for the months of June, July, August and September. Our soil test also indicates we need to apply some potassium per our soil test so we choose a 20-0-20 fertilizer. How much 20-0-20 do we need to purchase?



$$\frac{1.5 \text{ lbs of N}}{1000 \text{ ft}^2 \text{ month}} \times 233,000 \text{ ft}^2 \times 4 \text{ months} \\ = 1,398 \text{ lbs of N are needed for the summer}$$

To supply this we are using 20-0-20 which is 20% by weight N. In this case we **divide** the amount of N we need by the percent N in the fertilizer expressed as a decimal.

$$\frac{1.398 \text{ lbs of N}}{0.2 \text{ lbs of N}} = 6,990 \text{ lbs of fertilizer}$$

$$\frac{1 \text{ lb of fertilizer}}{1 \text{ lb of fertilizer}}$$

Whether we choose to buy the fertilizer in seven 1000 lb bulk bags or 140 50 lb bags we will need to buy 7000 lbs of fertilizer. How much product will we need to apply per 1000 ft<sup>2</sup>?

$$\frac{1.5 \text{ lbs of N}}{0.2 \text{ lbs of N}} = \frac{7.5 \text{ lbs of fertilizer}}{1000 \text{ ft}^2}$$

$$\frac{1 \text{ lb of fertilizer}}{1 \text{ lb of fertilizer}}$$

One last problem. We have a 2 youth baseball fields with 140,000 ft<sup>2</sup> of tall fescue that have become infested with chickweed and shepherds purse. We have chosen to apply a 19-0-10 fertilizer product impregnated with Confront herbicide at the rate of 0.68% active ingredients (aI). Our crew applies 8 50 lb bags of the product to the area while the foliage is moist to be most effective. To be effective in killing these weeds Confront needs to be applied at a rate of 0.75 lbs of aI per acre. Was enough Confront applied to be effective?

We applied 8 bags X 50 lbs/ bag = 400 lbs of fertilizer. The fertilizer contained 0.68% aI. So we applied

$$400 \text{ lbs fert.} \times \frac{0.68 \text{ lbs of aI}}{100 \text{ lbs fert.}} \\ = 2.7 \text{ lbs aI applied, but does this meet or exceed} \\ 0.75 \text{ lbs aI per acre?}$$

$$\frac{0.75 \text{ lbs aI}}{43,560 \text{ ft}^2} = \frac{x \text{ lbs aI}}{140,000 \text{ ft}^2}$$

$$= 2.4 \text{ lbs of aI needed so we have applied enough} \\ \text{Confront to be effective.}$$

Our fertility program recommends that we apply 1.5 lbs of N/1000 ft<sup>2</sup> to the fields as well.

$$\frac{1.5 \text{ lbs N}}{1000 \text{ ft}^2} \times 140,000 \text{ ft}^2 = 210 \text{ lbs N}$$

Have we applied enough N?

We applied 400 lbs of fertilizer that contained 19% N or 400 lbs X 0.19 lbs N/lb = 76 lbs N so no we did not apply enough N. In fact we need to apply 210 lbs N – 76 lbs of N = 134 lbs N short. We have some 30-0-0 in the shop. How much 30-0-0 will we need?

$$\frac{134 \text{ lbs N}}{0.3 \text{ lbs N}} = 447 \text{ lbs of 30 - 0 - 0}$$

$$\frac{1 \text{ lb fertilizer}}{1 \text{ lb fertilizer}}$$

For practical purposes we would apply 450 lbs of 30-0-0 or 9 50 lb bags.

Now to make these applications we need to calibrate our equipment. Calibration is a separate process from these mathematic problems and should be the subject of a future article. Errors are often made when these processes are combined. They are best uncoupled in my opinion. A very efficient turf manager I know has his crew spend time in the winter calibrating their fertilizer spreaders with all the products they plan to use in the upcoming year.

I hope I have given you some problems that you can follow. Now, go practice. ■

*Barry Stewart, PhD, is an associate professor in the Department of Plant and Soil Sciences at Mississippi State University whose specialty is sports turf science.*

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# John Mascaro's Photo Quiz

Answers from page 17

John Mascaro is President of Turf-Tec International

This municipal golf course in Kansas experienced a severe thunderstorm last May where they received almost 5 inches of rainfall within a 2-hour period on the golf courses and their athletic fields. The dark green lines on turf are a telltale sign of a lightning strike with the strike in the center and the finger-like lines of where the electricity spread out. If a golfer or maintenance worker were present during this storm, the photo would have a whole different ending. A couple days

later, the turf turned brown in these dark green areas. There was also extensive flooding on the golf course and sports facility. The city's synthetic fields received enough rainfall that the surface "wrinkled" but went down so fast that the parks supervisor was unable to get a photo.

*Photo taken by Terry Rodenberg, superintendent for recreation services, City of Overland Park, at the St. Andrews Golf Course.*



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](mailto: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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# CALCIUM AND CALCIUM-BASED SOIL AMENDMENTS IN TURFGRASS

*Editor's note: The author is director of research and development for Calcium Products, Ames, IA.*

▼ **Dispersed, sodic soil** with classic surface crusting. Poor infiltration and seedling emergence can be expected.

**T**he importance of calcium in any plant/soil system cannot be overstated. It is both a vital nutrient for plants and essential cation in soil, found in great quantities in both environments, making it somewhat unique in comparison to other elements. Although technically considered a secondary macronutrient, its

level in turfgrass plants ranks third after nitrogen and potassium. Despite the relative importance of calcium, it is often ignored or simply taken for granted by those managing the plant/soil system.

Calcium plays many roles in plant health, the most recognizable being its role in strengthening cell walls and within cells to maintain osmotic balance, thereby stabi-





lizing cell membranes. Since calcium is an important component of cell walls, its presence is also important in the presence of plant stressors as cell walls are normally one of the first areas invaded by pests. Calcium binds to pectin chains in turf cell walls, giving them stability and rigidity and also is necessary for the secretion of lubricating mucilage at root tips to aid in penetrating the soil. With a healthy root system and strong cell walls being important components of traffic tolerance, you can see how important calcium is on a highly trafficked athletic field. Calcium also plays an important part in the uptake of potassium and magnesium, which are both regulated by the amount of calcium ions found within the plant; a calcium deficiency results in increased susceptibility to red thread and *Pythium* blight.

The main reason that calcium is generally ignored in the turfgrass arena is that true calcium deficiency in grasses is rare. Monocots such as turf have a relatively low requirement for calcium when compared to dicots, with typical ranges from 0.3 to 1.25% and 0.5 to 2.0% and higher, respectively. Due to low cation exchange capacity and higher leaching potential, sand-based athletic fields may be one area that turf managers should monitor calcium levels in the plant and apply supplemental applications as necessary to ensure strong, healthy turf that will resist disease and traffic pressure. If deficiency does show up, it is displayed on new leaves that appear distorted, reddish-brown in color, and may wither and die; shortened and stunted roots may also result and are the predominant deficiency symptom in soils that contain toxic levels of aluminum, magnesium, hydrogen, and sodium that outcompete calcium on cation exchange sites.

Many soils in the United States contain sufficient calcium, which makes it easy to ignore. Soils in the Midwestern US routinely contain upwards of 80% calcium on base saturation in soil tests. However, turf managers who deal with soils that are aided by calcium-based soil amendment applications know well the importance of them in their management programs. Soils in the both the western and SE United States are ones traditionally associated with benefitting from calcium-based soil amendment applications. In the west, sodic soils are a widespread problem, and in the SE, low pH and subsequent aluminum toxicity are widespread. The mechanisms in which calcium solves these problems are different, but similar. In sodic soils, calcium is applied to replace sodium on cation exchange sites, allowing the sodium to be leached from the soil profile. Removing the sodium improves soil structure via flocculation, or 'bringing together' of soil colloids, which create aggregates, which are partially responsible for creating pore space in soils. Sodium is considered a dispersive cation and will create problems with infiltration, crusting, and seedling emergence. In soils with high levels of exchangeable aluminum, calcium sulfate (gypsum) applications help to suppress the aluminum by forcing it to react with the sulfate, creating aluminum sulfate and other compounds which are less toxic or not available for plant uptake.

Low pH is another area where calcium-based soil amendments are helpful in turfgrass. Calcitic limestone (calcium carbonate) is the predominant material used in most of the US to ameliorate low pH soils to help improve nutrient use efficiency and overall grow-



▲ Supplemental calcium application, resulting in less winterkill.

ing conditions. Although most turfgrasses tend to grow in a wide range of pH, it's an important agronomic principle for turf managers to keep an eye on and maintain in acceptable range. Dolomitic limestone (calcium/magnesium carbonate) should be used where magnesium is deficient.

Increasingly, more turf managers are using effluent water for their athletic fields, which can contain appreciable amounts of sodium, leading to problems where calcium-based product applications (i.e. gypsum) may become necessary. Similarly, as usage and weather patterns change across parts of the upper Midwest, sodic soils are becoming more widespread. Researchers at Colorado State University are examining the beneficial use of calcium-based soil amendments to reclaim soils that receive heavy sodium loads from effluent water. It is important to have water tested before using so you can develop a plan to combat any potential problems the water may cause.

Many people are confused as to the difference between saline and sodic soils, and this is an important distinction when it comes to gypsum soil amending. Sodic soils are exactly that, containing appreciable sodium, and saline soils can contain a wide variety of salts that need to be leached, not necessarily displaced by the calcium in gypsum. Soil testing should form the foundation of your maintenance program in these situations and contacting your local university extension service or fertilizer dealer can help you differentiate between these difficult soil types and where amending is appropriate.

Calcium is an extremely important element in any turfgrass environment, and its abundant presence, absence, or being overshadowed can make it easy to ignore or in high demand. Being able to identify where calcium-based products are needed is an important part of providing suitable growing conditions for your fields. ■



# MAINTAINING SCHOOL ATHLETIC FIELDS ON LIMITED BUDGETS

**S**econdary school athletic administrators today face great challenges in maintaining sports fields. One of the 14 legal duties of coaches and athletic administrators is to provide a safe environment for student athletes that includes playing fields, yet athletic administrators are facing budget cuts that challenge the ability to do so. In an effort to maintain playing fields, the athletic administrator must be creative in field management and

must develop ways to acquire the needed resources with less money.

The limited resources experienced by most athletic administrators fall in one or more of the following areas: (1) Knowledge—a large number of athletic administrators do not have the knowledge or training relative to the care and maintenance of natural or synthetic turf fields. In addition, a growing percentage of principals and superintendents have little or no background in athletics and do not realize the importance of supporting the athletic administrator in maintaining safe playing fields; (2) Finances/

Resources—many athletic administrators are being asked to cut budgets in these challenging financial times for school districts; (3) Personnel—in many situations, the athletic administrator may not have a grounds manager for the sports fields or at best there may be a grounds manager for the entire school district of which the athletic fields would be a part of that person's responsibility.

The NIAAA has made strides in addressing the limited knowledge of some athletic administrators. The NIAAA Sports Turf Committee composed of both athletic administrators and individuals from the industry corporate side has developed a number of programs to educate athletic administrators relative to management of sports turf fields. Four courses have

been written on the care and management of both natural and synthetic fields. These 4-hour seminar classes are taught across the country by the NIAAA. In addition, the committee writes articles for the NIAAA's quarterly publication, *Interscholastic Athletic Administration*.

A third education program created by the committee is the annual sports turf seminar conducted at the National Athletic Directors Conference. All of these initiatives provide training for the athletic administrator in the area of care and maintenance of sports turf fields. Athletic administrators are encouraged to take advantage of other educational opportunities such as seminars or field days conducted by regional STMA chapters, by university agronomy departments or by companies in the turf industry. The NIAAA encourages its member State Athletic Administrator Associations to partner with an STMA chapter in their state to conduct sports turf seminars at state athletic administrator conferences.

It is not easy to address the limited personnel available to maintain the fields. If the athletic administrator is faced with a lack of staff to properly maintain the fields, there are some options. One is to designate funds in the athletic budget to hire personnel. This is usually not a viable option because the athletic budget is already stretched far too thin.

Another option is to ask the school district to allocate more funds to employ necessary grounds maintenance personnel. This is also a challenging option because of tight school budgets and the need to hire academic staff first. There is also the educational gap in many districts where the superintendent and/or school board does not understand the importance of maintaining safe fields. Unfortunately, too many school leaders learn the importance of safe fields the hard way when facing litigation due to an injury on an unsafe field. School districts then realize the cost

---

» In many communities a partnership between the school district and the park department or golf course can result in a **sharing of the equipment to meet the needs of all entities.**



▲ Bruce Whitehead, CMAA



▲ **School districts** should realize the cost of [professional] grounds maintenance personnel can be far less than the cost of settling injury litigation.

of an additional grounds maintenance person would have been far less than the cost of settling the injury litigation.

The third option for the athletic administrator to address this need is to seek in-kind labor from either the booster club or companies in the community who specialize in turf products or services. In many schools, the booster club can be called upon to provide labor and companies in the community can provide the expertise.

Acquiring the resources necessary to maintain safe fields does not have to be directly related to the athletic department or district finance available. Yes, it would be optimal if the athletic department or school district budget allocated necessary funds to purchase the required products, equipment and services but that does not always happen. In many communities a partnership between the school district and the park department or golf course can result in a sharing of the equipment to meet the needs of all entities. Partnerships between the school district and local businesses can also be developed. The school district might offer some advertising opportunities to local businesses in the event programs, on the public address during events or on signage at the venues in exchange for products or services.

Athletic administrators face a greater challenge today to provide safe athletic fields, but it is something we owe to the students participating in our athletic programs. It is a challenge that can be met if the school, the

community and the sports turf companies come together in partnerships.

*Bruce Whitehead, CMAA, has 33 years in public education as a teacher and coach, and*

*for the final 25 years was Director of Athletics at Crawfordsville (IN) High School. While an athletic administrator, Bruce was a member of the IIAAA board (Indiana Interscholastic Athletic Administrators Association), the IHSAA Board (Indiana High School Athletic Association) and the NIAAA Board. Bruce has been employed by the NIAAA for 13 years and has been the executive director for the past 9 ½ years.*

## ABOUT NIAAA

The NIAAA is located in Indianapolis and is the national organization for high school and middle school athletic administrators with 9,000 individual members. The membership includes athletic administrators from organizations in the 50 states, the District of Columbia and internationally. The NIAAA champions the profession of athletic administration through education opportunities, advocating ethics, developing leaders and fostering community. ■

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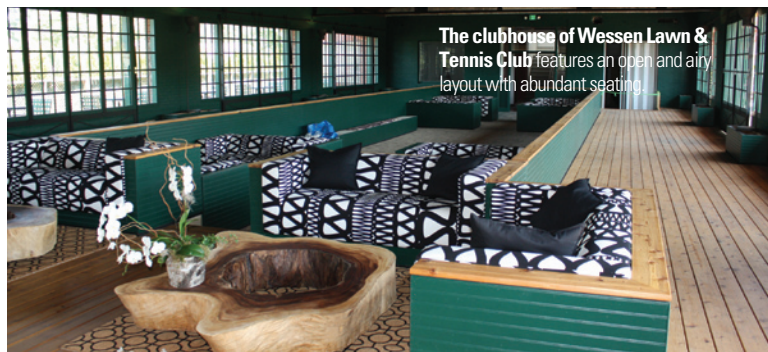
**Wessen Lawn & Tennis Club** Owner & Founder Bill Massie with his convertible Mercedes that serves as the marquee for his new tennis complex in Pontiac, MI.



**One of Wessen Lawn & Tennis Club's 24 natural grass courts** with the clubhouse in the background. The original building was constructed in 1919 and served as the Pontiac waterworks.



**Just like at Wessen's inspiration, Wimbledon, players must wear all white.**



**The clubhouse of Wessen Lawn & Tennis Club** features an open and airy layout with abundant seating.



**Wessen Lawn & Tennis Club** uses a Jacobsen SLF-1880 large-area reel mower to maintain its 24 natural-grass courts.

# ARCHITECT BUILDS *NATURAL GRASS* TENNIS COMPLEX

*Editor's note: This article was written by Jacobsen's public relations staff*

**W**hat started as an afternoon musing during a tennis tournament turned into an obsession for Bill Massie.

"In 2008, while watching my 13-year-old son play in a tennis tournament at the beautiful Longwood Cricket Club outside of Boston, I thought to myself, 'I'm going to go back and build something like this in Pontiac,'" recalls Massie, an architect by trade.

The first thing Massie did upon his return was build a perennial rye test court. Other than mowing fairways on a

golf course for one summer during his youth, Massie had no experience or training in growing grass.

"I leaned heavily on Joe Vargas, professor of turfgrass science at Michigan State University," said Massie. "We threw the traditional golf-centric, sand-based agronomics out the window because this is literally a whole different ball game. A sand-based grass surface would never hold up to the rigors of tennis."

After mastering his ryegrass skills, Massie decided to take it to the next level. He purchased an abandoned recreation center and 50 acres of surrounding property in Pontiac, MI just outside of Detroit.



"It was an ideal site for what I wanted to do. There was an existing pool and clubhouse that we renovated extensively," said Massie.

With his architecture background and experience, Massie was able to prepare the site for tennis courts himself, doing much of the laser leveling and drainage work.

"I built a 14 x 80-foot trench that's about 10 feet deep and filled it with crushed concrete from the old building foundations. When it rains, the water runs off these courts almost immediately," said Massie. "I put a slight grade on the whole thing but it's a perfect plane so you would never notice. From one side of the property to the other, the turf actually drops a total of 18 inches."

The attention-to-detail can be seen all over the property. From the etched metal water fountain to the vintage tennis ball cans inlaid into the clubhouse bar, every inch of Wessen Tennis club has been meticulously and thoughtfully planned.

But as Massie will tell you, not all the Wessen plans went smoothly.

"It was the second week of September last year and we were sitting on \$6,000 worth of grass seed," says Massie. "Conditions were ideal and there was just a small rain shower in the forecast for that evening. We put all the seed down and almost on cue, it rained. And it never stopped. It rained an inch and a quarter in one hour and washed every last bit of seed into the river."

Heartbroken but not defeated, Massie knew the window was closing on the chances for a 2014 opening. He had new seed shipped from Oregon in just 3 days and had full turf growing by October.

"We dodged one bullet but got hit with another as the worst winter in decades followed," said Massie. "I thought we'd be able to do more to prepare for the cold but it came so quickly we couldn't do much of anything. We had record snowfall and record cold but as you can see, the ryegrass survived quite nicely."

"People tried to convince me to try other grass varieties but I knew ryegrass was the right choice, especially with the wear patterns and toughness," said Massie. "You

We put all the seed down and almost on cue, it rained. And it never stopped. **It rained an inch and a quarter in one hour** and washed every last bit of seed into the river."

could use bentgrass, but it would get very stressed from the wear. Also, ryegrass has no thatch, so you really get a good ball bounce. And it's no secret that these courts are really modeled after Wimbledon, which is also ryegrass."

To maintain the ryegrass on the 24 courts, Massie and his crew use a Jacobsen SLF-1880 large-area reel mower. They keep the grass at a height-of-cut of .375 inch, which would be considered fairway tournament height for a golf course.

"I love to get out there and mow, but there's a lot of pressure to finish the clubhouse and the pool, so I've been very busy with that," says Massie. "But I do look for-

ward to getting back to working on the turf side of things, that's fun for me."

Massie already has 105 members with a goal of 150 founding members by the end of summer. Like Wimbledon, players must wear all white on the courts.

Massie's plans for the future include bringing an ATP-level tournament to Wessen and have junior and pro players train for grass tournaments like Wimbledon.

"When people come out here and play, it's something completely new for them," said Massie. "And that was the vision all along of Wessen Lawn & Tennis Club: to give people a truly unique tennis experience on natural grass." ■





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# DEVELOPING & IMPLEMENTING BMPs

## for sports field water conservation



**W**ATER CONSERVATION is not all about irrigation. It is primarily about the plant and doing the correct agronomic practices that allow the plant to survive periodic dry periods. Research has shown that a properly planned landscape that has been carefully installed and properly managed will be healthier, less prone to insects and diseases, and will require less irrigation.

Water is essential to human life, the health of ecosystems, and economic development. However, summer drought is common for much of the US when significant rainfall amounts may be 30 or more days apart. These periods of limited rainfall increase demand on public water supply systems. During the summer months, municipal water use increases between 30% and 50% generally for outdoor recreational purposes (e.g. swimming pools), utility purposes (e.g. car washing and pressure washing) and, for lawns and landscapes. No doubt, water conservation is a concept which must be adopted as water resources become more limited.

Turfgrasses are the primary vegetative covers on airports, athletic fields, cemeteries, churches, commercial buildings, golf courses, home lawns, schools, parks, and

### Two quick and simple practices to improve turfgrass water use:

**1. Raise the mowing height.** There is an optimal height range for each turfgrass species, during periods of drought raise the mowing height to upper end of the range. This helps increase the rooting depth and ability of the grass to extract water from greater depths.

**2. Decrease the nitrogen rate.** Each turfgrass species has an optimal nitrogen fertility range; during periods of drought reduce the amount of nitrogen to the lower end of the range. This avoids overstimulating the grass during periods when water resources are limited.



roadsides. Healthy grass is an aesthetic asset and a growing body of scientific evidence points to positive environmental and health contributions from lawns and other turfgrass areas. While turfgrasses are typically thought of for recreation and aesthetic value, they also provide a valuable environmental service by preventing soil erosion. As a permanent vegetative cover, turfgrass can reduce runoff from rainfall, improve soil absorption and infiltration of water, and filtering contaminants from polluted water. Furthermore, recent research indicates that turfgrass systems help rid the atmosphere of greenhouse gases, like carbon dioxide (CO<sub>2</sub>), which contribute to the global warming.

To meet the nation's demands for water resources, the focus must be on how to use water more efficiently without sacrificing environmental quality. This objective can be achieved through proper selection and installation, and integrating turfgrass management practices which accentuate a plant's natural ability to survive, despite a temporary deprivation of required resources (e.g. nutrients and water).

The Best Management Practices (BMPs) for turfgrass water conservation can be employed by all levels, from the well trained turfgrass professional to the homeowner. The BMPs are basic agronomic tools which will improve the overall health of the turfgrass plant and, in turn, will condition the grass to better withstand seasonal and prolonged drought. A few BMPs specific to turfgrass water conservation are:

## **BMP 1 – PROPER TURFGRASS SELECTION**

Selecting the proper turfgrass is perhaps the most important factor in planning, planting, and maintaining a lawn for water conservation. A properly selected grass species or cultivar is more likely to thrive and need fewer inputs (e.g. water, fertilizer, pesticides, etc.). Turfgrass selection should be based on environmental conditions, turfgrass quality or appearance desired, and maintenance requirements. Environmental conditions to consider include temperature and moisture, shade adaptation, soil pH and fertility. It is also important to realize that all turfgrasses

have good and bad features. Thus, selection should be based on which turfgrass most nearly meets the criteria considered. Using grasses which have been genetically bred for an intended purpose or geographic region further enhances the turfgrass plant's ability to survive specific stresses.

## **BMP 2 – SOIL AMENDMENT**

Improvement in either the chemical or physical characteristics of the soil can reduce turfgrass irrigation needs by enhancing infiltration of rainfall, increasing soil moisture retention, and promoting deeper rooting to reduce water leaching beyond the rootzone. To improve water conservation, amending native soils prior to planting can be beneficial during the establishment process and for long-term sustainability of the landscape. The water and nutrient holding capacity of the sandy soils have different needs than clayey soils and, therefore, need

to be modified or managed accordingly. Sandy soils have little moisture or nutrient holding capacity. While the addition of some clay can improve water and nutrient holding capacity, it makes the soil more prone to compaction under traffic and normal use. In general, changing textural (percent sand, silt, and clay in a soil) and physical characteristics are more difficult than modifying the chemical characteristics, yet, these changes can be made to improve soils for the purpose of water conservation. Furthermore, the organic matter content can have a tremendous affect on moisture and nutrient retention.

You want deeper roots with more soil volume to explore for water and nutrients. Organic amendments improve the physical and chemical properties of the soil. They not only help the soil hold water and nutrients, they also improve water movement throughout the soil.




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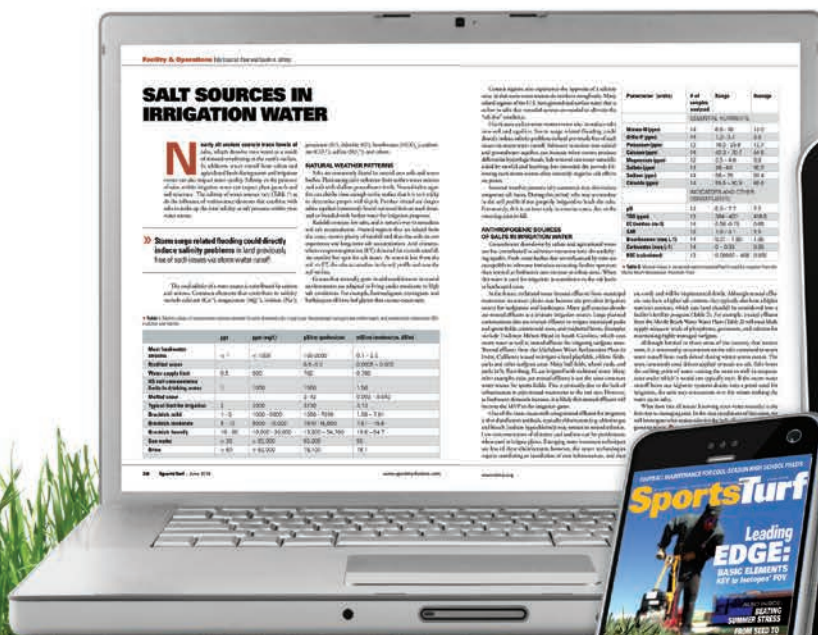
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### BMP 3 – PROPER IRRIGATION

Each unique microclimate, or zone, within the landscape should be irrigated separately according to the needs of each zone. Allow plant factors to indicate a need for supplemental water. Apply only the amount of water the turfgrass needs to wet the root-zone. For many plants and crops there are growth periods when water is critical to physiological and reproductive processes. However, for most homeowners and turfgrass managers fruit set and seed-production are not important processes. Basically turfgrass needs water to maintain growth. The exception to this is during establishment where water requirements would be the greatest. Once established, turfgrass requires relatively little water for survival. In fact, research conducted in throughout the US supports the recommendations of established turfgrass requiring approximately 1-inch of water per week during the growing season.

### BMP 4 – MANAGE EXTRINSIC STRESSES

To reduce water use, maintain turfgrass stand density, and promote survival during periods of drought stress, wear must be minimized. A thinned/weakened turfgrass will require more water for basic maintenance of physiological processes and recovery than a turfgrass which has ample cover despite being drought stressed. Proper management of extrinsic stresses, like traffic and plant competition, aid in reducing water use by maintaining turfgrass stand density and promoting survival during periods of drought stress.

Water conservation in all areas of water use, indoor and outdoor, is becoming more critical. But through proper agronomics and judicious irrigation, landscapes can be maintained during periods of drought. Fortunately, the Southeastern US will only experience periodic drought and environmental conditions will eventually change. When rainfall returns, established turfgrasses will typically resume growth and regain color. During these good periods it is imperative that proper management practices be employed to precondition fields for the next drought.

A positive and proactive approach to water conservation is essential for the sports field industry within each state. The best approach is one used for other environmental issues, BMPs. The following elements are key to fostering the BMPs approach at the regulatory level.

- Define what is meant by BMPs for water conservation on sports fields for the understanding of the field manager and facility staff, as well as, for that of regulatory agencies, environmental groups, and the general public.
- Actively strive to gain acceptance for this approach in ordinances, regulations and public policy.
- Adopt and implement a BMPs approach on our sports fields, not just as a general concept but as a daily operating policy.



- Use moisture probes, smart controllers, and other new technologies. ■

*Clint Waltz is Associate Professor and Turfgrass Extension Specialist, University of Georgia; Kenny Pauley is Director of Athletic Turf Grounds, University of Georgia.*

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# HOW ONE FACILITY COLLECTS WATER

▲ The water from the collection tank is filtered on the way out of the tank before reaching the pumping system..

**G**rinnell College completed phase two of an athletics building construction project in late August of 2010. The phase two construction consisted of an Olympic size swimming pool and an indoor field house with athletic offices attached. Phase one, Darby Gymnasium (home of the record-breaking Grinnell men's basketball team), was completed in 2005. A unique aspect of the phase two project included a rain water collection system from the large field house roof and surroundings, which feeds a 20,000-gallon collection tank. Condensate water is

also harvested from the air handling system in the field house, which provides a large amount of clean water for the collection tank. The water collected is used for toilets

**When the tank water level reaches 91 inches**, the excess water is diverted to the storm sewer system that feeds the Grinnell Country Club ponds.





▲ **Down spouts** from field house roof feed the collection tank.



▲ **The field house roof** behind the football game field.

in the field house and to irrigate the game day football field.

A new main irrigation line, valves, decoder system and controller were installed after the building project was completed. This system was hooked onto our current infield piping and irrigation heads. We

installed a Hunter Industries wireless Solar Sync ET sensor to help with weather monitoring, which helps conserve water on the football field.

City water is used for all of our other fields and the water quality is not good. With the city water's high pH, bicarbonates and sodium issues, the idea of using natu-

ral rain water was quite positive. With any unique projects we had our reservations but after a full calendar year of having the system in tactic it has performed well.

How the collection system works is simple; the rain water is collected from the roof, storm drains, and bleachers from the field house area and funneled by drains into the concrete 20,000-gallon holding tank under the field house. Condensate from chiller and air conditioner units also help feed the storage tank.

The collection tank was actually dug, formed and poured with concrete as the field support structure was being constructed. When the tank water level reaches 91 inches, the excess water is diverted to the storm sewer system that feeds the Grinnell Country Club ponds. Irrigation for golf course is pumped out of these ponds. When a low point level is reached at 34 inches the system switches to city water by sensors and

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► **The variable pump system** has been a large upgrade; also the coverage of the irrigation heads has increased.

electric valves, until the collection tank is recharged by rainfall. As an example, the summer of 2013 saw a state-wide drought and our system never switched over to city water because the condensate collection kept up with the watering demand. Ground water seepage and the condensate lines must be adding a lot of water to the tank to keep up with our current water demands and lack of rainfall.

The water from the collection tank is filtered on the way out of the tank before reaching the dual variable pumping system; this system is based on flow needs for the restrooms and field irrigation. The variable pump system has been a large upgrade; also the coverage of the irrigation heads has increased. The water quality has been relatively good so far; we have been sending in water samples to track the water quality to see if there is much fluctuation in the tank water through the year. One interesting sample I sent in early April 2011, at our irrigation system start up, was of water that had sitting for an extended period of time; the test came back very good even after being stagnate. Water test have fluctuated some but the tank water has been a huge upgrade in quality for our turfgrass compared to our city water.



This water collection system has been a success so far and more systems similar to this will be examined for any future building projects on our campus. Benefits we are experiencing so far include saving water, spending less money on water resources, slowing the watershed runoff speed from the building, and increasing the water quality immensely. ■

*Jason Koester, CGCS, is the sports turf manager and irrigation specialist for Grinnell College, Grinnell, IA.*

▼ **When the tank water level reaches 91 inches**, the excess water is diverted to the storm sewer system that feeds Grinnell Country Club ponds.



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# Membership Application

## SportsTurf MANAGERS ASSOCIATION

Experts on the Field, Partners in the Game.

Note: This form is valid only for first time STMA National members through September.

Membership benefits continue through Dec. 31.

Fax to: (785) 843-2977

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

Name	Title		
Employer/ Facility			
<input type="checkbox"/> Business	<input type="checkbox"/> Home		
Address			
City	State	Zip	
Home phone	Work	Cell	
Fax	Email		
Signature			
Direct Supervisor Name			

### New Members\*

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

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

Person who referred you:

Facility name:

### Membership Category:

- |   |      |
|---|------|
| <input type="checkbox"/> Sports Turf Manager  | \$55 |
| <input type="checkbox"/> Sports Turf Manager Associate* (Additional member(s) from the same facility) | \$55 |

Please select the primary facility type where you are employed:

☐ Professional Sports ☐ Higher Education ☐ Schools K-12 ☐ Parks and Recreation

- |  |       |
|--|-------|
| <input type="checkbox"/> Academic  | \$55  |
| <input type="checkbox"/> Student (verification of enrollment)  | \$25  |
| <input type="checkbox"/> Commercial  | \$148 |
| <input type="checkbox"/> Commercial Associate* (Additional member(s) from the same commercial company)   | \$75  |
| <input type="checkbox"/> Affiliate (Person who is indirectly or on a part-time basis, involved in the maintenance/management of sports fields) | \$50  |
| <input type="checkbox"/> Retired   | \$50  |

<input type="checkbox"/> Chapter Dues (contact headquarters for amount)	
Chapter name) _____	\$ _____

<input type="checkbox"/> Contribution To SAFE Foundation (research, education and scholarship):	\$ _____
---	----------

<b>Total Amount Enclosed:</b>	\$ _____
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### 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

\*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.

**In order to receive the FREE conference registration, you must be a current member in the year that you use the registration.**



# LESLIE FRAZIER FIELD, Trinity International University

■ **Category of Submission:** College Football  
■ **Sports Turf Manager:** Andy Yeaman  
■ **Title:** Grounds Supervisor  
■ **Education:** NCA in Agriculture (Scotland)  
■ **Full-time staff:** Randy Chappell and Jonathan Ware

■ **Other staff:** James Ware and Josh Kelsey  
■ **Original construction:** 1988  
■ **Rootzone:** Native soil, 40% loamy sand  
■ **Turfgrass variety:** Kentucky bluegrass, 5-way ryegrass, and tall fescue

■ **Overseed:** We overseed with ryegrass by broadcasting. The process is first to core aerate, then broadcast the seed, roll and water.  
■ **Drainage:** Frazier Field uses 4, 6, and 8-inch PVC drainage pipe that are tied into existing drainage tiles.





## WHY STMA SHOULD CONSIDER YOUR FIELD A WINNER?

Trinity is a small, Christian institution with fewer than 2,000 students. In 1988 Trinity started a football program in the NAIA CCAC conference. The field was built and named after the first coach, former Chicago Bear defensive back Leslie Frazier, who now coaches in the National Football League.

Our limited budget and resources make it a challenge to keep up and maintain our field; however, with hard work, diligence and pride we have one of the best fields in the division. These accolades come from outside sources such as the other teams and our suppliers, and in an age where there is only a handful of natural grass fields left this is a huge feather in our cap.

Another factor to consider for this award is that we have a small crew of only three full-time and two part-time staff for the entire university, which is more than 110 acres. This factor reinforces our application and makes this field even more prestigious for our institution to obtain. ■

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

## Equipment list

- John Deere 3520 tractor with 72-inch mowing deck
- John Deere 1445 tractor with 72-inch mowing deck
- John Deere 485 lawn tractor to pull the spreader
- EarthWay pull-behind broadcast spreader
- Frontier 3-point hitch core aerator
- Agrafab 48-inch core aerator
- Jiffy model 5000 line striper
- Agrafab 800-pound, 6-foot roller and 300-pound, 4-foot roller
- Backpack sprayers for weed control
- Turfco Mete-R-Matic 3 model F12D topdresser
- Cushman Truckster turf vehicle
- John Deere 4 x 2 Gator
- Honda Foreman Rubicon vehicle with broadcast spreader







## STIHL Inc. Celebrates 40 Years of Manufacturing in the United States

**I**n 2014, STIHL Inc. is celebrating 40 years of manufacturing in the United States. Founded in 1974 by Andreas Stihl AG & Co. KG, Waiblingen, Germany, STIHL Inc. began with less than 50 people assembling one model of chain saw. It has grown to 1,900 employees in Virginia Beach (with 200 more employees in branch locations) building more than 70 different models and more than 275 model variations in the U.S.

STIHL Inc. manufactures chain saws, grass and weed trimmers, leaf blowers, hedge trimmers, edgers, extended-length hedge trimmers, pole pruners, brushcutters, earth augers, wood-boring drills, monofilament trimmer line, and chain saw guide bars.

Located in Virginia Beach, Va., STIHL Inc., the headquarters for U.S. operations for the worldwide STIHL Group, exports to more than 90 countries around the world; and the majority of STIHL powerheads sold in America are also built in America.\*

The company, which originally operated out of only 20,000 square feet of rented space, now boasts more than 2.4-million square feet (under roof) of building space nationwide (2 million of which is located in Virginia Beach). The company has 150 total acres of property in Virginia Beach (180 nationwide).

Distribution is exclusive to six independent U.S. distributors and six STIHL-owned marketing and distribution centers that sell STIHL products to a nationwide network of 8,500 servicing retail dealers.

STIHL is the only gasoline-powered chain saw manufacturer in the world that designs and manufactures its own saw

chain (in Switzerland) and guide bars, with the newest guide bar manufacturing facility in Virginia Beach. STIHL products are protected by more than 1,000 patents.

STIHL “firsts” include:

- Automatic chain oiling
- Centrifugal clutch
- Chain braking system
- Electronic ignition system
- Single-lever Master Control Lever
- Anti-vibration system
- Quick Chain Adjuster (QCA) system
- Side-access chain adjustment
- ElastoStart system
- Ematic System
- World’s quietest, gasoline-powered chain saw (at the time, 1996)
- Auger brake
- STIHL Easy2Start dual-spring starting mechanism
- Dual chain braking system
- Intelligent Engine Management (IEM)
- STIHL M-Tronic
- World’s first electronically controlled fuel-injection system on handheld outdoor power equipment

*\*A majority of STIHL powerheads are built in the United States from domestic and foreign parts and components.*

*Information provided by STIHL Inc.*

All photos provided by STIHL Inc.

# Timeline



**1974**

STIHL began manufacturing in the U.S. with the 015 chain saw.



**1977**

STIHL Inc. broke ground for Manufacturing Plant I and Administrative Offices.

**1980**

Crankshaft, Heat Treating and Polymer departments added.

**1982**

In-house injection molding developed.



**1985**

STIHL Inc. launched the STIHL TIMBERSPORTS series on ABC/ESPN.

**1989**

Production expanded to include trimmers, specifically FS 36, FS 40 and FS 44 models.



**1992**

Fred Whyte (above) named president of STIHL Inc.

**1993**

Production of the 029, 039, and 009 MiniBoss chain saws; HS 72, 74 & 76 hedge trimmers and FC 72 edger.

**1995**

STIHL Inc. achieved globally recognized ISO 9001 registration for quality.

**2000**

STIHL Inc. awarded U.S. Senate Productivity Medallion of Excellence. STIHLUSA.com launched.

**2002**

U.S. Production of 4180 (4-MIX) series engine began.

**2004**

STIHL Inc. recognized with Governor's Environmental Excellence Award (Silver) and inaugural Virginia Shingo Prize by Virginia Manufacturers Association.



**2007**

Hans Peter Stihl (above right), son of STIHL founder, Andreas Stihl, dedicated a 60,000-square-foot guide bar production plant, marking the first time guide bars are manufactured in the U.S.

**2009**

STIHL Inc. started producing the majority of all STIHL powerheads worldwide. STIHL became the number one selling brand in America\*.



**2012**

STIHL Inc. produced its 50-millionth powerhead.



**2012**

Acting Secretary Rebecca Blank (above right) selected STIHL Inc. as site to announce the Make it in America Challenge, a \$40-million initiative to accelerate the trend of insourcing.

**2013**

STIHL Inc. receives Association for Manufacturing Excellence award.

**2014**

Celebrating 40 years built in America\*\*.

\* "Number one selling brand" is based on syndicated Irwin Broh Research, as well as independent consumer research of 2009-2013 U.S. sales and market share data for the gasoline-powered hand-held outdoor power equipment category combined sales to consumers and commercial landscapers.

\*\* A majority of STIHL powerheads are built in the United States from domestic and foreign parts and components.

Information provided by STIHL Inc.



# Tools & Equipment

For more information on these and other products, please visit [www.greenmediaonline.com/productportal](http://www.greenmediaonline.com/productportal).



## New topdresser from TurfTime Equipment

TurfTime Equipment's new TT 2430 Advantage topdresser is becoming a contractor and manager favorite for synthetic and natural turf. Designed to spread material faster than competitors, the industry's largest eight paddle spinners distribute material evenly up to 50 feet wide. With two simple adjustments, an operator can drop 6 ft. baseline. The large hopper with sideboard option accommodates 2000 lb bags of infill mix for synthetic fields. These heavy-duty topdressers are built on durable two or four-wheel chassis, and come with several power options.

**TurfTime Equipment**



## New TurfCat out-front rotary mower

Jacobsen has introduced a completely refreshed TurfCat out-front rotary mower. Featuring all-hydraulic deck and traction drives, the multi-purpose machine provides the lowest cost of ownership in its class. The new TurfCat costs significantly less to maintain because it has no gear box, belts, pulleys, drive shaft or clutch to service. The new TurfCat has 15 less grease points and 212 less service parts compared to competitive products. In addition to the TurfCat's lower cost of ownership, the rotary mower is also extremely versatile, offering nine different deck configurations and five attachments for year-round use. In addition to offering a blower, dozer blade, hydraulic broom and snow blower, Jacobsen offers the industry's only 60-inch fine cut flail deck for the TurfCat.

**Jacobsen**



## New machine for synthetic turf maintenance

Earth & Turf Products, LLC, has introduced the TruFlow 54D-ATS or Artificial Turf Special. This special unit can be used to put down crumbed rubber and sweep it into the fiber layers or be used as a topdresser to add crumbed rubber as required to rejuvenate artificial turf fields or lawns. The TruFlow ATS is designed with one brush in the front and one in the back to provide two sweeping actions, reducing the need for hand brushing. The 54D-ATS has a capacity of 15 cu. ft. Higher sides can be added when using only crumbed rubber. The 54D-ATS is another example of Earth & Turf's simple well-built machines. Price is under \$3,000.

**Earth & Turf**

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[jjuda@specialtyim.com](mailto:jjuda@specialtyim.com)



## New Mission, Vision guide STMA into the future

**D**uring the STMA Summer Board meeting a full day and a half day was dedicated to strategic planning. Facilitators from Leading Associations helped the Board look to the future and create five strategic goals. As part of the process, the Board spent time evaluating its mission to be certain it answers the question, “Why does STMA exist”? Consensus is that our mission has been functioning more as a vision for STMA. Thus, the Board created a new mission for STMA and officially established a vision, which it has not previously had.

These new guideposts for STMA are:

**Mission:** STMA advances professionalism in sports field management and safety through education, awareness programs, and industry development.

**Vision:** To be the recognized leader in strengthening the sports field industry and enhancing members’ competence and acknowledgement of their profession.

Although the strategic plan has not yet been finalized, there was agreement around five strategic areas: communication and brand awareness; the value of commercial members to the association; establishing our members as environmental stewards; the importance of

natural grass athletic fields to outdoor sports; and providing members with relevant and timely continuing education. Once the objectives for each goal are set, which will include metrics for success, STMA’s Committees will be heavily engaged to brainstorm tactics on how to best reach these objectives.

The planning process included an exercise on defining the strengths, weaknesses, opportunities and threats to the association and also an assessment on the success of the current strategic plan. STMA has made significant progress on its current strategic plan, which is scheduled to be completed by December 31. Highlights from that plan will be shared in **SportsTurf** at the end of the year, and the new plan will be rolled out in January during the conference and in the magazine.

The primary facilitator, Sam Albrecht, CAE, gave high praise to the board for their dedication. He wrote in his summary report, “This is a well-functioning group with the best interests of the membership and the industry at the top of their lists. The passion and commitment in the room was as good as I’ve seen in any organization.” —By Shant S. Thomas, STMA Sales & Marketing Manager & STMA Staff. ■

## STMA’s public relations and marketing engagement efforts see tangible results

**B**eginning in the Fall of 2013, STMA engaged a multipronged public relations and marketing effort to more comprehensively tell key audiences, including sports turf managers’ employers, the general public, and those in sports media, about the benefit of the profession and necessity of having a sports turf manager on staff. This effort took an initial two-pronged approach: one, hire a public relations firm with sports and general media contacts to get the word out about STMA and sports turf managers; and two, produce and air a PBS special entitled “Spotlight On: The Field.” Both of these efforts were detailed by STMA CEO Kim Heck in San Antonio at STMA’s Annual Meeting and Lunch last January.

### Buffalo Communications: telling STMA’s story

STMA hired Virginia-based Buffalo Communications (BC) in November 2013 to spearhead an aggressive media relations effort on behalf of the association. Buffalo is a division of Billy Casper Golf, owner-operator of more than 130 golf properties nationwide, and has offices in New York, Phoenix, Boston, Minneapolis and Pinehurst, NC, according to its website.

The ultimate goals of engaging a firm such as a BC are varied but interconnected. The driving impetus and goal behind everything, how-

ever, is the increase in profile of the sports turf manager and profession as a whole. Some strategies to achieve this include:

- Telling “human stories” of STMA members and the extraordinary jobs they do. This makes field management something the layperson can more easily relate to. Buffalo Communications reaches out to sports turf managers across the country and helps facilitate connecting these individuals with members of the media in their area.

- Identifying technology and trends in field management to underscore the specialized, expert nature of the sports turf management profession. This effort also stresses why having a sports turf manager/Certified Sports Field Manager (CSFM) on staff is critical.

PR specialist Glenn Gray is STMA’s day-to-day contact and works closely with headquarters staff to identify and promote STMA members and trends.

For example, Gray is currently working with Marcela Munoz and Roberto Gurgel in Brazil to extend the media lifecycle of natural grass storylines (all 12 World Cup stadiums). He recently reached out to Sporting KC to secure quotes from Matt Besler and Graham



Glenn Gray



Zusi about their preference for playing on natural grass during the World Cup. Glenn and BC have also recently conducted a number of interviews with STMA members including Seth Whitehill (Little League Baseball), Jeff Salmond, CSFM (University of Oklahoma), Mike McDonald, CSFM (University of Minnesota), Michael Stachowiz (National Park Service), Tony Leonard (Philadelphia Eagles), Dave Mellor (Boston Red Sox) and others.

Buffalo Communications media relations efforts have resulted in stories of sports turf managers appearing in *Sports Illustrated*, *Minnesota Star Tribune*, *BleacherReport.com*, *The Globe and Mail*, *Boston Globe*, *The Tennis Channel*, *USA Today*, Michigan's Big Show, *Washington Post*, *Recreation Management*, *SportsBusiness Journal* and more. For a complete list of this media relations effort, please visit [stma.org](http://stma.org).

If you are a member with a great story to tell, reach out to Sales and Marketing Manager Shant Thomas at [stthomas@stma.org](mailto:stthomas@stma.org) so we can get it out there!

### Spotlight: On the field, and on STMA

Many sports turf managers don't like to be in the spotlight; they prefer to let their great playing surfaces speak for themselves. Recently however, the profession was highlighted in a PBS special entitled "Spotlight: On the Field" produced by the association and aired nationally. STMA CEO Kim Heck played the special at the association's Annual Meeting and Lunch in San Antonio this past January with a promise to update members when the results of those airings came in. "Spotlight: On the Field" was a rousing success!

With this specific type of video, the interested producing party works with a company to put together the piece, which is then submitted to a central pool of videos that PBS stations across the country can then draw from. STMA was guaranteed a minimum number of airings, but that number can be exceeded if station managers receive requests to re-air a broadcast or simply choose to re-rerun it.

In a letter to STMA, Tower Productions Vice President of Communications Michael Casey stated the video "did well," adding it "air[ed] 878 times in 49 percent of all U S television households, reaching a gross audience of 4,431,900 viewers." These airings took place in 207 major markets, from New York, NY and Bowling Green, KY to Las Vegas, NV and Terre Haute, IN.

Thank you to all who assisted in the production of this video to place a much-needed spotlight on our fields. The video is available for viewing on the association's website, [stma.org](http://stma.org) and via our YouTube channel (accessible via [stma.org](http://stma.org)). -By Shant Thomas, Sales and Marketing Manager. ■

## Press coverage and other highlights: sports turf managers in the news

"I've always enjoyed competing at the highest level on natural grass and I'm glad FIFA decided to go this route with all 12 World Cup venues," says Matt Besler, Sporting KC and US men's national team defender. "I was very impressed with the playability and conditions in Brazil, especially how well the field drained in Recife for our final group stage match against Germany."

Quote secured by Glenn Gray/Buffalo Communications, July 31, 2014

"Natural grass fields take much more energy to prepare for elite competitions like the FIFA World Cup," says Graham Zusi, Sporting KC and US men's national team midfielder. "The time spent preparing them is much appreciated by the players, as the touch and feel on grass is more consistent."

Quote secured by Glenn Gray/Buffalo Communications, July 31, 2014

### The Boston Globe

"Maintaining immaculate yet playable grass tennis courts is a balancing act for head groundskeeper Mike

Buras, CSFM and his 12-person crew at Longwood Cricket Club in Chestnut Hill. The fibrous *poa annua* species used on Longwood's 25 grass courts is a native variety that is frequently labeled a weed, but Buras says when properly managed, it makes a desirable court surface. 'Grass is a living thing, and we learn to push the limits to make the courts as good as can be,' said Buras, 53."

From "Serving up the right grass for tennis" by Cindy Atoji Keene, Boston Globe correspondent

<http://www.bostonglobe.com/business/2014/08/02/groundskeeper-serves-grass-courts-for-tennis/1p0fU2zYXkskbFPTq8giul/story.html>



"When the Giants opened up a new team headquarters called Timex Performance Center (since renamed Quest Diagnostics Training Center) in 2009, the organization hired [Rob] Davis to be its head groundskeeper. This past week, Davis, also a member of the Sports Turf Managers Association, put

the finishing touches on a Quest facility that will host its second consecutive training camp after the Giants moved home from the University at Albany last year."

From "Behind the Scenes: New York Giants Head Groundskeeper Shares His Insight" by Kevin Boilard, Featured Columnist, BleacherReport.com

<http://bleacherreport.com/articles/2135198-behind-the-scenes-new-york-giants-head-groundskeeper-shares-his-insight>



"Andy McNitt is a leading authority on all grasses, both natural and artificial, as the director of the Center for Sports Surface Research at Penn State University. He is also a long-time member of the US-based Sports Turf Managers Association. McNitt sees no reason why the Blue Jays will not be able to lay grass down within Rogers and have it thrive.

"It's going to be a big investment in the lights, but certainly we have the technology to grow grass indoors," he said."

From "Rogers Centre looking to make artificial grass a thing of its past" by Robert MacLeod, The Globe and Mail (Canada)

<http://www.theglobeandmail.com/sports/baseball/field-of-dreams/article1895554/>

# Family affair at Little League World Series

## STMA volunteers celebrate 15th anniversary

**L**ast month, the world's best youth baseball players from across the globe descended upon the idyllic rural setting of Williamsport, PA for the Little League World Series (LLWS). These exceptional athletes, ages 11 and 12, traveled with family and friends for the chance to be immortalized with teammates as the 2014 LLWS Champion.

Eight domestic and eight international teams battled in the summer heat from August 14 to 24. LLWS games are contested each year at two premier Little League Baseball (LLB) stadiums, Lamade and Volunteer, in Williamsport. Each venue features Kentucky bluegrass natural surfaces and can accommodate up to 3,300 spectators with an additional 30,000 fans on the hill. LLWS continues to be one of the most elite junior sporting events and remains free for all to attend.

The 88-acre baseball complex features six fields, including Lamade and Volunteer stadiums, one full-sized baseball field, two practice fields and one practice in-field. In addition to providing superior playing and practice surfaces, LLB facilities are also home to four dorms. Participants reside here during the 10-day tournament.

Since first televising the event in 1994, the global reach and recognition of LLWS has helped grow the sport. More than 70 million viewers tuned to ESPN, ESPN 2, ESPN 3, ESPN U and WATCH ESPN in August. The additional media coverage has put a premium on producing secure, playable and visually-appealing fields for TV viewers.

Seth Whitehill, head groundskeeper of the LLB complex, was hired in April 2011. He manages one-part time employee and one intern during the summer. For the LLWS, he directed 40 Sports Turf Manager Association (STMA) volunteers for 2 weeks surrounding the event.

"Our number one goal is providing a safe playing surface for the athletes," says Whitehill, an STMA member since 2011.

This year marks the 15th anniversary of STMA assisting Whitehill's grounds crew, with representation from multiple STMA regional chapters. Some members traveled from as far as California to contribute to the 10-day event, taking personal vacation days and time away from their families. In addition to daily mowing and painting lines, the volunteer turf team carefully watered each field, broomed the edges and made necessary repairs to the clay in the home plate circle and pitcher's mound.

Jeff Fowler, Academic Rep for STMA's Board of Directors, has helped every year since STMA got involved and, again, coordinated logistics this year with Whitehill for the volunteers. But this year was more special than most as Fowler was joined by his father, Don, and son, Evan.

"It was an exciting year for our family as three generations were represented," says Fowler, District Director for Penn State University's

Cooperative Extension. "Sports turf has been a common bond for all of us and it was great to share quality time with them."

Fowler credits his Dad for getting him involved with LLWS. In 1995, the stadium's premier field was not in top condition. Don was nominated as the renovation coordinator for an extensive project of re-sodding and refurbishing LLB's stadium. He led and directed fellow Keystone Athletic Field Managers Organization (KAFMO) volunteers throughout the 782-hour process. The mini-major league facility debuted on August 24, 1996. Don's involvement and tireless efforts for nearly two decades has been instrumental to the success and popularity of LLWS.

Evan, Jeff's son, was a welcome addition to the grounds crew. He is a graduate of Penn State University and 2014 recipient of the James R. Watson Undergraduate Safer Athletic Field Environment Scholarship. Currently, he is an assistant groundskeeper with the Kansas

City Royals under STMA member Trevor Vance. Whitehill and the LLWS volunteers can credit this year's cohesion to three generations of Fowlers.

In addition to the STMA's milestone of 15 years of volunteer service, 2014 marks the 75th anniversary of LLB and the 68th anniversary for LLWS. The on-site LLB Museum was a hot attraction for tournament attendees.

LLB is the largest, best-funded youth sports organization in the world with 2.4 million players on 160,000 teams across 76 countries. This includes 1.9 million players and 5,500 leagues in the United States. Despite the major growth of the organization over the years, LLB remained true to its original purpose of being a member-oriented, service-driven non-profit that provides organization, insurance and other benefits to community leagues. It is operated solely by volunteers and guided by the principal that any child who wants to play will find a safe and structured place regardless of ability. ■



▲ Jeff Fowler, left, Academic rep for STMA's Board of Directors; his son, Evan, assistant groundskeeper with the Kansas City Royals; and Don Fowler, whose involvement and tireless efforts for nearly two decades has been instrumental to safe playing conditions for the Little League World Series.



## Several major STMA Awards deadlines fast approaching!

**S**everal STMA programs, including Innovative Awards, Field of the Year Awards, SAFE Scholarship and Founders Awards, have application deadlines October 15.

### STMA Innovative Award

The deadline for STMA Commercial Members to apply for the STMA Innovative Award is October 15. All commercial companies that are exhibiting at the 2015 STMA Annual Conference & Exhibition are invited to submit an entry (electronically only) to be recognized as an Innovative Award Winner.

New this year: **All entries will be recognized on signage and in the conference on-site guide.** This recognition will help attendees identify new products, the company that developed them, and the booth number.

As you select the product, equipment, technology, or service to enter, consider this description of "innovative":

- is cutting edge
- has never been seen

Any STMA Commercial member who is exhibiting at the upcoming STMA Annual Conference and Exhibition is eligible to submit one entry annually. The company must display the innovation in its booth and have introduced it for sale within a 2-year period. The only criteria that the innovation must meet is that it should substantially enhance the effectiveness of the sports turf manager and/or make the surfaces safer and more playable for athletes.

A panel of non-commercial STMA members representing all segments of membership will judge the entries and may give the award to multiple companies that meet the criteria.

Winner(s) will be kept confidential until announced during the first day of the STMA Trade Show. Winner(s) will be able to use the special Innovative logo in their promotion of the winning product, service, technology or equipment and will receive an award to display. STMA will publicize the winners through its communication vehicles, STMA press releases, signage at the conference and with special recognition during the Annual Awards Banquet.

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**Start taking pictures and documenting your progress now!** The STMA Awards Committee encourages sports turf managers to be creative in their applications and pictures, while still working within the framework of the program.

### STMA Field of the Year

The STMA Field of the Year program deadline is October 15. All materials must be submitted electronically by this date. Be sure to read the application carefully, as the entire process is done electronically. The process requires that applicants fill out no less than four STMA Playing Conditions Index (PCI) worksheets to apply for Field of the Year. The STMA PCI is also available online.

New this year: **Now only PCI scores need to be transferred to the application; the full PCIs do not need to be attached.**

Through the Field of the Year program, STMA is able to significantly further one main element of its mission: To gain acknowledgement for the professionalism of its members. This year, based on the results of the judging, the "Fields of the Year" Awards will be presented at the STMA Annual Awards Banquet, January 16, 2015, in Denver. In addition to being featured in this magazine, winning fields will also receive:

- A plaque recognizing the field and the Sports Turf Manager Registration to the STMA Conference
- Three nights of lodging, excluding incidentals, at the STMA Conference
- STMA signature apparel for the winning sports turf manager and their crew

Suggestions from the STMA Awards Committee on Putting Together Winning "Field of the Year" Award Entries:

Start taking pictures and documenting your progress now! The STMA Awards Committee encourages sports turf managers to be creative in their applications and pictures, while still working within the framework of the program. The committee encourages creative photos, photos that show the versatility of the field, display unique characteristics of the field, and photos that show the unique talents of the crew. Focus on issues specific to your field which tell the story; issues such as drainage, traffic, weather, etc. Provide before and after shots. Do not simply provide "beauty shots" of your field, as they do not reflect the true struggles and triumphs of you and your crew.

### SAFE Scholarships & Grants

SAFE Scholarship applications are due October 15. All materials must be submitted in one packet and faxed applications will not be accepted.

### STMA Founders Awards nominations

STMA Founders Award nominations are due October 15. These are STMA's most prestigious awards and are presented in honor of the founders of STMA: Dr. William Daniel, Dick Ericson, George Toma and Harry Gill. More information is available online at [stma.org](http://stma.org). For applications, nomination forms, to get the STMA ■

## A summer with SAFE: an intern's diaries

**T**he SAFE Foundation strives to champion safe, sustainable sports and recreation fields for all athletes, and I had the amazing opportunity to intern for them this summer. As a student at the University of Kansas, I was pleased to discover such an amazing non-profit so close to my heart right here in Lawrence! I played competitive softball for 15 years growing up, and understand how critical it is to have safe fields for athletes to play on. Even during my college career, intramurals depended on safe fields to ensure a fun and successful game.

I got to work on a variety of projects as an intern for the SAFE Foundation. Not only did I get to learn what the SAFE Foundation was all about, but I also got to help improve the foundation for the future. From an intern's perspective, you can't really get a better opportunity than that.

Over the course of the summer I had many different things on my plate, but the main focus was the scholarship anniversary articles. As seen in the August issue of *SportsTurf*, and also in the upcoming November issue, I got the opportunity to interview and talk with some amazingly successful people about their scholarship experience through SAFE. Speaking with those celebrating their 10-year

and 20-year anniversary since receiving their scholarship, I was able to learn how the SAFE scholarships can benefit students and their future careers. The best part about speaking with these individuals was what they had to say about the sports turf community. Every person I talked to raved about the camaraderie and friendships they had within the industry, and how receiving their scholarship and being introduced to STMA was a great launching point.

Most of these friendships rekindle when they join forces at STMA's Annual Conference. Since the SAFE Foundation's funding greatly benefits from the raffles, auctions and events at the conference, my responsibilities included promoting and requesting donations for these events. I also did a little investigation into more options for our silent auction for women. Looking into such options as athletic wear to a relaxing spa day, SAFE is hoping to cater toward the women of our industry.

Another main task for me this summer was working on the SAFE Foundation's social media and website. Since more and more people are taking to the internet and smart phones to find information, my job was to help find ways to make this more accessible to

*Continued on page 49*

## STMA Affiliated Chapters Contact Information

**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

**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://stmalabasin.com)

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

**Intermountain Chapter of the Sports Turf Managers Association:**  
<http://irmstma.blogspot.com/>

**Indiana -** Contact Clayton Dame, [Claytondame@hotmail.com](mailto:Claytondame@hotmail.com) or Brian Bornino, [bornino@purdue.edu](mailto:bornino@purdue.edu) or Contact Joey Stevenson, [jstevenson@indyindians.com](mailto:jstevenson@indyindians.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)

**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.stmonny.org](http://www.stmonny.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.socalstma.com](http://www.socalstma.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)

**Wisconsin Sports Turf Managers Association:** [www.wstma.org](http://www.wstma.org)

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F ☐ Sports Complex G ☐ Athletic Field and/or Park Architect/Designer  
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 H ☐ Other (please specify) \_\_\_\_\_

**2 Which of the following best describes your title? (check ONLY ONE)**

A ☐ EXECUTIVE/ADMINISTRATOR — President, Owner, Partner, Director,  
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 B ☐ MANAGER/SUPERINTENDENT — Superintendent, Landscape/Ground  
 Maintenance Manager, Foreman, Supervisor  
 C ☐ GOVERNMENT OFFICIAL — Government Commissioner, Agent, Other  
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 D ☐ SPECIALIST — Architect, Designer, Consultant, Agronomist, Horticulturist,  
 Certified Specialist  
 F ☐ COACH  
 E ☐ Other (please specify) \_\_\_\_\_

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

**4 Yearly operating expenditures (excluding salaries)**

F ☐ Over \$1 million C ☐ \$50,001 - \$100,000  
 E ☐ \$500,001 - \$1 million B ☐ \$25,001 - \$50,000  
 D ☐ \$100,001 - \$500,000 A ☐ \$25,000 and under

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

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 Name \_\_\_\_\_ Title \_\_\_\_\_

Continued from page 47

them. Using the SAFE Twitter handle, I was able to promote SAFE's scholarship opportunity and their new Night of Entertainment for the 2015 STMA Conference in Denver. I also got to compose tweets recognizing donors who graciously gave to the SAFE Foundation. Twitter is a great way for the STMA and SAFE twitters to correspond and promote each other. Testimonials, pictures of raffle auction items and links to SAFE's website are all things you could find on SAFE's Twitter. On SAFE's website, I added a Testimonials page. This page is full of scholarship advice straight from the source of those who have already received the scholarship. I also added an option on the contact page where previous scholarship recipients could also share their story with us. Since we would not have the time to interview all recipients,

this gives anyone an opportunity to share their story and have their advice on the testimonials page.

Over the course of the summer, I have learned so much about this industry and researching for a new advertisement for SAFE helped me learn even more. I had the opportunity to gather some statistics for a new advertisement. This advertisement will be used to show numbers of how sports turf managers impact their community and how crucial it is to have safe fields to prevent injuries.

I am very grateful to any and all who have corresponded with me and helped me gather information this summer. I truly understand that the sports turf community is one of the nicest and most helpful, and I look forward to seeing how sports turf managers, STMA and the SAFE Foundation progress in the future. ■





## Q&A with Dr. Grady Miller

Professor, North Carolina State University

**Questions?** Send them to Grady Miller at North Carolina State University, Box 7620, Raleigh, NC 27695-7620, or email [grady\\_miller@ncsu.edu](mailto:grady_miller@ncsu.edu). Or, send your question to David Minner at Iowa State University, 106 Horticulture Hall, Ames, IA 50011 or email [dminner@iastate.edu](mailto:dminner@iastate.edu).

# Even new fields can need core aeration

*So, it seems the sod that was recently installed on our manufactured sand-based profile has a fine-textured soil. It is being tested. What can we expect and/or what should we do?*

— Greensboro, NC

**S**o this message arrived in my inbox and a few days later I had a chance to visit the site. The general use soccer/practice field seemed to have been well constructed by an outside contractor. It was built with a good sand profile, modest crown, in-ground irrigation, and good-looking (installed within the week) bermudagrass sod. The staff onsite had seen some puddling following an afternoon shower and started considering if the soil that came with the sod may be the cause.

I pulled up a few sod pieces and removed some chunks of soil. Using the feel method, I could make a continuous ribbon when pressed between my thumb and fingers. I proclaimed to those watching that the “composition included a fair amount of clay and silt.” If only I had paid closer attention when I took soils, perhaps I could have made a more educated classification. I was told the contractor had taken some samples for an independent laboratory analysis but not knowing when they would get the results, we collected some for North Carolina State to analyze. It never hurts to get a second evaluation.

A couple of days later the results from the laboratory analysis requested by the contractor were sent to me (the second set are not expected for another week). The test came back indicating the sod’s soil had 23% silt and 4% clay. Considering the sand size separation the soil was classified as a fine sandy loam. So while it sounds like a pretty good soil, the infiltration rate was tested to be 0.02 inches per hour. I do not know any turf manager that would want that low an infiltration rate. In

contrast the rootzone had an infiltration rate of nearly 12 inches per hour.

The standards provided by ASTM indicates that the ratio of the rootzone to sandy loam soil to be compatible though not ideal. It is not very common to purchase sod grown in a native soil that would have a composition similar to USGA sands. Despite the fine-sized particles found in this sample, the soil is probably among the better soils for growing crops or turfgrasses in North Carolina. I am sure many high quality athletic fields have been built out of similar soils.

Of course the outcome of every field construction project could range from failure to success depending on how it is managed and used after the contractor turns it over to the management team. I am confident this field will get great care because everyone from coaches to field staff wants the best. Plus the conditions of other fields at this location suggest they have the management capacity to provide a high quality product.

This field will require some extra attention early in its life. As soon as the field’s sod

and then pick up the cores. Afterwards the field should be topdressed with the same sized sand material used to build the sand-based rootzone. This is the best and fastest way to alleviate layering and keeping the surface open for water infiltration.

I would suggest trying monthly aerification with large tines. As long as the grass is growing over the aerification holes and the level of use is not resulting in additional damage, then aerify. To replace the fine-textured soil will take numerous aerifications. This is because core aerification influences a relatively small portion of the surface area. Using three quarter inch tines on 5 inch by 5 inch spacing only displaces 1.8% of the surface area. So it would take eleven core cultivations to impact 20% of the surface area.

With careful management there is no reason why this field cannot have a championship-level of quality. It will just take more aggressive management during the first few years to ensure this quality. Unfortunately this will increase management and mate-

» Of course the outcome of every field construction project could range from failure to success **depending on how it is managed and used after the contractor turns it over to the management team.**

is sufficiently rooted, they need to start core cultivation. Since they have the newly installed sand profile they really do not need to go very deep. In this situation, the purpose of core cultivation is not to alleviate compaction. It is to get rid of as much of the finer-textured soil as possible and to open channels down into the sand profile. The field staff should use 0.75-inch tines to core out that fine soil

rial costs. In a perfect scenario a sand-based sod would have been used so there would have been far less frequent core aerification needed this first couple of years and the cores would not need to be removed. They could have been re-incorporated into the surface as part of the topdressing process. So, unfortunately even new fields can need core cultivation. ■



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