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July 2013

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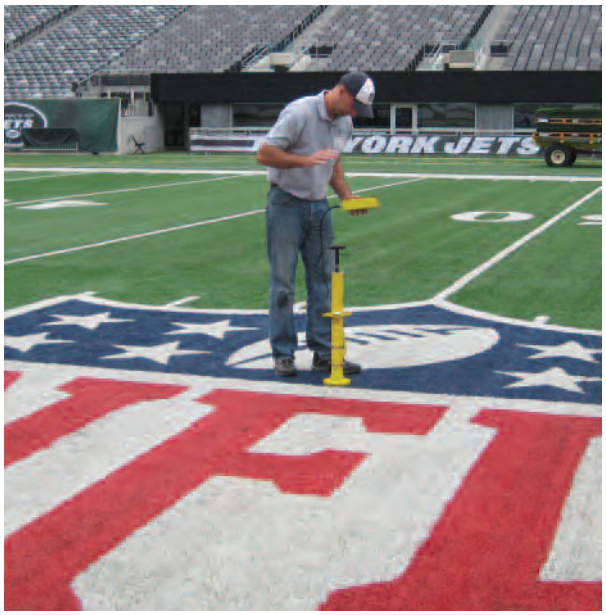

SportsTurf Contents

JULY 2013 | VOLUME 29 | NUMBER 7

On the cover:
Jack Trice Stadium on the campus of Iowa State University in Ames was named STMA 2012 College Football Field of the Year. Turf manager Tim VanLoo, CSFM, relies on a completely turf student crew to help him maintain the Cyclones' athletic fields and surrounding grounds.


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From the Sidelines

Eric Schroder
Editorial Director

eschroder@specialtyim.com

717-805-4197

Turf war doesn't need a winner

ONE OF THE BIGGEST, if not THE biggest, common denominator among the sports turf managers I know is a pure and simple love of growing grass—the science and the art of preparing their fields for competition. When talking about their turf they often sound like proud, involved and concerned parents discussing their children. I had an NFL guy tell me once as he was leaving an STMA meeting, "I've got to get back to my baby."

So naturally (pun intended) the recent increase in the number of synthetic fields being built across the country is troubling to many turf managers, some who see it as a real threat to their livelihoods. From my following of this industry, I see two main reasons why more communities, school districts, and higher education institutions are opting for synthetic. One is "keeping up with the Joneses," meaning nearby towns or schools have synthetic fields and so their neighbors want one too; the other is, and this is a real shocker, money. As in, for example, if we build this field we can have users on it 24/7 and profit from the rental fees.

Many facilities have the space and budget for both natural fields and a synthetic surface (or more), which may be the ideal situation today. Often those lucky folks can have a showcase natural field for games and big events, while avoiding practice traffic and wear by using the synthetic field. But some who don't have that luxury, if they can afford to, are building synthetic fields, often with funds generated by booster groups or wealthy donors.

Of course those in the know don't claim synthetic fields are "maintenance-free" and that includes the industry's main trade organization, the Synthetic Turf Council (see page 28 in this issue for evidence). In fact, to get their money's worth from infill surfaces, owners had best employ a good turf manager or risk needing to replace their investment years before its expected life.

My Google news feed titled "synthetic turf" regularly includes items from across the USA where proponents of synthetics make "maintenance free" claims in public forums. A smaller number of items include claims from citizens that the infill material is toxic, or the fields spread bacteria to users, etc., and turf scientists from our best universities continue to conduct research on environmental concerns.

Those same researchers, as well as turfgrass breeders, also continue to work to improve the natural stuff and how it is maintained for sports use. Many of our readers work tirelessly to have their natural fields in top shape year round as well.

And while it's understandable that some of the marketing tactics by the synthetic industry make people's teeth hurt, we all should realize there are uses for both it and natural turf. Management teams that didn't make taking care of their natural fields a big enough priority will probably repeat the mistake with their new fields.

Here's hoping one day everybody truly appreciates the need for professionals to maintain athletic surfaces of all kinds, for every athlete. ■

Error of omission

In our March 2013 article "Turf farmers' advice on choosing and successfully managing thick-cut sod," we used several photos, on pages 14 and 16, without crediting the source. Those photos were from 2012 STMA Innovative Award winner, Paul Carlson of Green Source Inc. and Central Sod Farms, and his SideKick machine. We regret the omission.

SportsTurf

1030 W. Higgins Road
Suite 230
Park Ridge, IL 60068
Phone 847-720-5600
Fax 847-720-5601

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President's Message

Dr. Mike Goatley

Goatley@vt.edu

Reminded of my ignorance

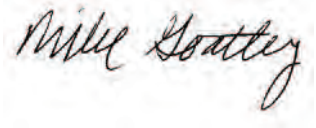
WHAT I LIKE BEST about being an educator is that the learning never stops, especially for the teacher. I recently completed an intensive training and testing program on nutrient management with a group of generally well educated, mid-to-late career professionals with varying turfgrass science backgrounds. One of the participants I visited with over dinner was 3 years from retirement and had recently been transferred into a new job. I learned that he had served in the military, then with the state police, and finally in a job at the state engineering office. Due to budget cuts, he was reassigned into a different branch of the agency for which he had no training at all. Out of our conversation, he proceeded to give me a very different take on the word "ignorant," a word I typically think of with a negative connotation.

"Doc, I used to think I should know everything, but I finally came to the realization that no matter how hard I tried, I remained ignorant about most things. And, no disrespect intended, but you are ignorant about most things, too. That's just the way it is. But I want you to know that while I am ignorant about all of this turfgrass stuff, I am not dumb…one just doesn't know what one doesn't know. And one more thing, whoever said ignorance is bliss definitely did not have his tail on the line trying to pass your test tomorrow."

I very much appreciated his candor, his attitude, and, yes, even for reminding me just how ignorant I am about many things!

A key to combating ignorance is education. You will find an educational theme throughout this month's *SportsTurf* with a special emphasis on the 2014 Conference Educational program. Education Committee Chairman Jeff Fowler and his committee have developed a really well-balanced educational program that offers something for everyone. The program contains a great mix of sports turf managers, academics, and commercial vendors, all ready to share their expertise and experience with their colleagues. Do you learn by listening or by doing? Do you learn in a classroom setting or through face-to-face contact? All of these interactions are part of what makes our annual conference and trade show the success that it is. Please plan on joining your peers next January in San Antonio to interact, attend the myriad of educational sessions, and visit with our trade show vendors.

By the way, when my new friend turned in his test he told me "I don't know if I passed, but I can assure you I am not as ignorant about turfgrass as I was yesterday." I shook his hand, thanked him for coming, and said "I've never appreciated so much being reminded just how ignorant I am. You got me to looking for this quote from Confucius that applies to both of us: 'Real knowledge is to know the extent of one's ignorance'." I am proud to report that my friend passed with flying colors. ■



▲ **HERE'S THE SAME FIELD 4 YEARS LATER** at the end of a season after hosting 70 events, and after reconstruction and yearly renovation.

No more muddy football fields

JUST AS TECHNOLOGY to produce better synthetic turf football fields improved over the past decade, so has the technology for real turf football fields. The ideas presented here for football fields can be used for other fields that have trouble keeping a thick stand of grass like soccer, lacrosse, field hockey, and rugby fields. This article includes the most recent recommendations for grass football fields (grown on native soil) to keep fields thriving. We will explore the latest technology in football field construction, reconstruction, and renovation that makes this possible. The recommendations for keeping fields thriving in wet climates also work for fields in dry climates. Soil structure and pore space are the key elements.

Sound maintenance practices are a must including: soil testing, fertilization, mowing, irrigation, aeration, seeding (if necessary), and pest control (weeds, insects, and disease).

Here are some particulars to consider for real turf football fields that host up to 70 events per year. In the north, Kentucky bluegrass fields should have a yearly rest period of one full growing season in the spring. For football fields in the south, bermudagrass fields can be overseeded in the fall for winter and spring sports with a rest period in the summer. Sound maintenance practices are a must including: soil testing, fertilization, mowing, irrigation, aeration, seeding (if necessary), and pest control (weeds, insects, and disease). Commit to a yearly renovation program and replace the sod every 10 years. Most facilities that have real turf football fields should be able to afford these easy to follow, full-proof methods. (See ESTIMATED BUDGET at the end of this article.)

CONSTRUCTION AND RECONSTRUCTION

For an existing field, remove the grass, treat the soil, grade, and sod. If the budget allows, install irrigation and subsurface drainage before sodding. For a new field, start with treating the soil.

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Photo 1


Photo 2


Photo 4


Photo 5

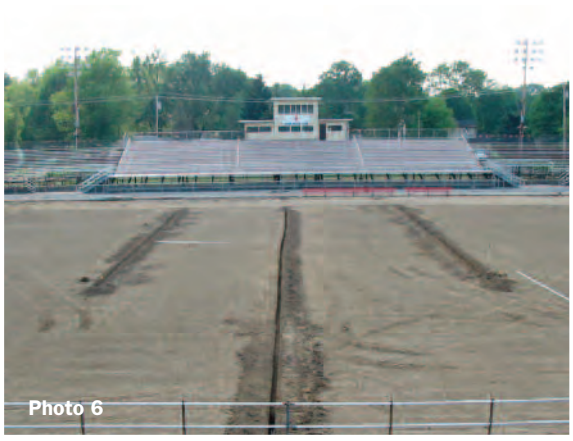
Photo 6


Photo 7


Photo 9


Photo 10

move the grass is to plow the existing grass under just as a farmer would plow the field to plant a new crop. Allow 3-4 weeks for the sod to decompose. (See photo 1)

Soil Treatment. An additional benefit to plowing is the compacted top layer of soil ends up on the bottom and the loose soil from the bottom ends up on top. This creates better soil structure with more pore space for improved drainage and rooting. Continue to treat the soil by disking, lightly tilling, and pulverizing (see photos 2 and 4).

Positive Surface Drainage. Perform a topographic survey to determine the existing grade including consistency and percentage of slope. Then develop a proposed grade plan to correct any inconsistencies remembering that grass football fields need at least 1% slope to remain playable in wet conditions.

Grade the field according to the proposed grade plan using equipment with turf tires or tracks to minimize compaction (see photo 5).

Optional Pop-up Irrigation System. All of the irrigation water lines must be installed in trenches that are a minimum of 18" deep if a subsurface drainage system is going to be installed. This depth allows the drainage system to be installed 12" deep over the top of the irrigation lines (see photo 6).

Optional Subsurface Drainage System. The pipe for the drainage system must be installed in trenches that are a maximum of 4" wide by 12" deep. Use 1" by 6" cloth rapped vertical drains or 2" perforated corrugated pipe. Backfill the trenches to the surface with coarse to very coarse sand with

less than 5% passing the 100 sieve screen (see photo 7).

Big-Roll Sod. Look for sod that is mature (1 to 1-1/2 years old) and grown on soil that is similar to the native soil of the field. If it's available (and especially if the drainage system described above is installed), use sod with sandy soil. If it's not available at this time, use native soil sod. Aerating and topdressing with sand will begin next year and provide better rooting and better drainage.

Before the sod is installed, apply starter fertilizer recommended by soil test results and go over the surface with a finishing tractor attachment like a power rake. This attachment removes small debris and provides a flat, smooth surface to prepare the soil for sod.

Then install the big-roll sod using Kentucky bluegrass in the north and bermudagrass in the south (see photo 9).

YEARLY RENOVATION

Create a 3 to 4 inch sand-cap over a 10-year period with this yearly renovation program starting the year after the sod is installed. The sand layer will allow surface water to drain quickly into the underdrains (if installed). The field will get better each year.

Aerate and topdress with 3/8" of the sand that was recommended for the subsurface drainage trenches. You will need about 75 tons to topdress the field (goal post to goal post and sideline to sideline including the bench areas). This process should be done every spring between April and May for cool season grasses and between May and June for warm season grasses. The results are better rooting, thicker turf that will hold up to more events, and improved drainage. Use a solid-tine vibrating aerator unless you can remove the cores that a hollow-tine core aerator leaves behind. Mixing the topsoil cores with the coarse sand will contaminate the sand and prevent drainage (see Photo 10).

Don't worry about creating a perched water table that will prohibit drainage by topdressing with a different material than already exists on the field. In fact, the opposite is true; placing coarse material over fine material allows water to drain freely through the coarse material and into the fine textured soil below and eventually into the underdrains (if installed). A perched water table is created by placing fine material over coarse material preventing water from draining through the fine material until it reaches almost 100% capacity. USGA putting greens and high profile sports fields are built using a perched water table with the intent of keeping the sand moist.

After 10 years of when the sod was installed, replace the sod as you would the carpet on an artificial turf field. Let's face it, nothing lasts forever.

This time you won't be able to use a plow to remove the grass. Use a big-roll sod cutter or other conventional machine to physically remove the sod and the thatch layer to dispose of off-site.

Remove some of the sand at this time leaving about 1-1/2" to 2" of the sand below. This will allow for yearly topdressing with sand for the next 10 years.

Install sod that is grown on a coarse sand soil or washed sand to prevent a perched water table (placing fine over coarse texture).

Beginning in the spring of the following year, start topdressing with about ¼" if sand yearly (50 tons of sand). That will bring the sand layer back to 4" before it's time to replace the sod again. Then start all over by removing the sod and 2" of sand and so on and so forth.

ESTIMATED BUDGET

Initial reconstruction cost to remove the grass, grade, and sod: $60,000

Optional: full field irrigation $32,500

Optional: subsurface drainage installed on 20 ft centers. $32,500

Yearly renovation: $8,000

After ten years replace the sod: $60,000

The total for a 10 year commitment program: $124,000 (excluding irrigation and drainage). ■

Jim Puhalla is the president of SportScape International, Inc. in Boardman, OH specializing in Sports Field Design, Consulting, and Construction Supervision and coauthor of 3 sports field books.


Figure 1


Figure 2


Figure 3

Improving Native Soil Fields

THE QUALITY AND LONGEVITY of an athletic field is directly related to the drainage capability of the soil. How fast water drains into and through the soil (infiltration rate, KSat) is the best indicator of how many games can be played and how the field will react during a rain game. Ideally, fields should have a minimum infiltration rate of 1 inch/hr., but it is not uncommon to see soils with infiltration rates of 0.01 inches/hr. or less.

The infiltration rate of a soil is influenced by the soil texture and the level of compaction the soil is subjected to. Fields with low infiltration rates create very poor playing conditions. When wet, they turn to mud, when dry they turn to concrete (Figure 1). Turf plants will not grow in these soil conditions and so the field gets taken over by weeds like prostrate knotweed, clover, dandelions and *Poa annua*. Turf growth is so poor that nutrients are not taken up, so the turf becomes chlorotic/yellow and does not recover from wear. Slow turf growth is more susceptible to diseases like red thread and rust. It is also impossible to get seed established on hard, compacted soils (Figure 2). Improving the infiltration rate of the soil therefore is the key to improving field conditions.

There are short term fixes to improve infiltration. These include using aeration equipment like a core aerator, spiker, deeptiner or verti-drain. These machines punch holes in the soil, allowing water to enter and O^2 and CO^2 to enter and exit. After a period of a couple of weeks or less however, those holes seal over and the previous conditions return.

A long-term fix is to amend the soil with a material that improves the infiltration rate, namely sand. As well as improving infiltration rates, topdressing evens out the playing surface and fills holes that could cause athlete injury (Figure 3). Applying 50 tons of sand to a field per year via topdressing appears to be an effective rate. It is possible to apply higher rates of 60-100 tons, especially if the sand is applied in two increments (spring & fall). The sand is either applied alone or in combination with soil or compost. The soil &/or compost typically makes up 10-30% of the mix. Adding compost to the mix is a good way to get some organic material into the soil if it is lacking. Compost improves the soil health (increased oxygen, reduced bulk density, increased water holding capacity) and also adds nutrients. The soil component in a topdressing mix helps to maintain surface stability (sand alone does not have good shear strength) and also retains moisture, which is important for seed establishment.

The soil &/or compost typically makes up 10-30% of the mix. Adding compost to the mix is a good way to get some organic material into the soil if it is lacking.

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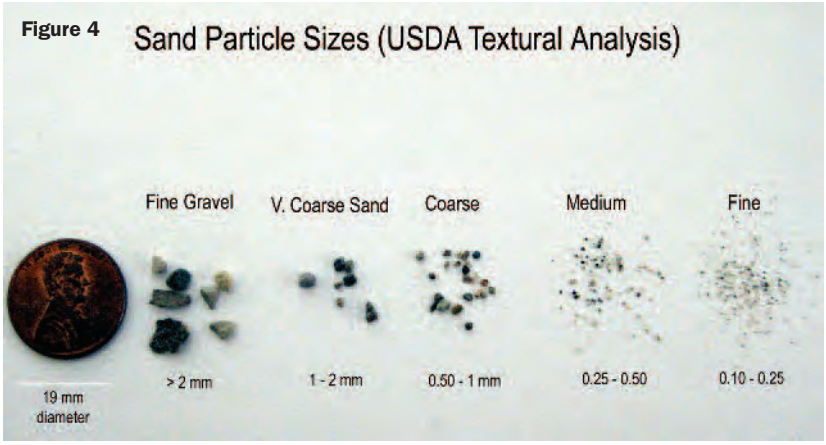
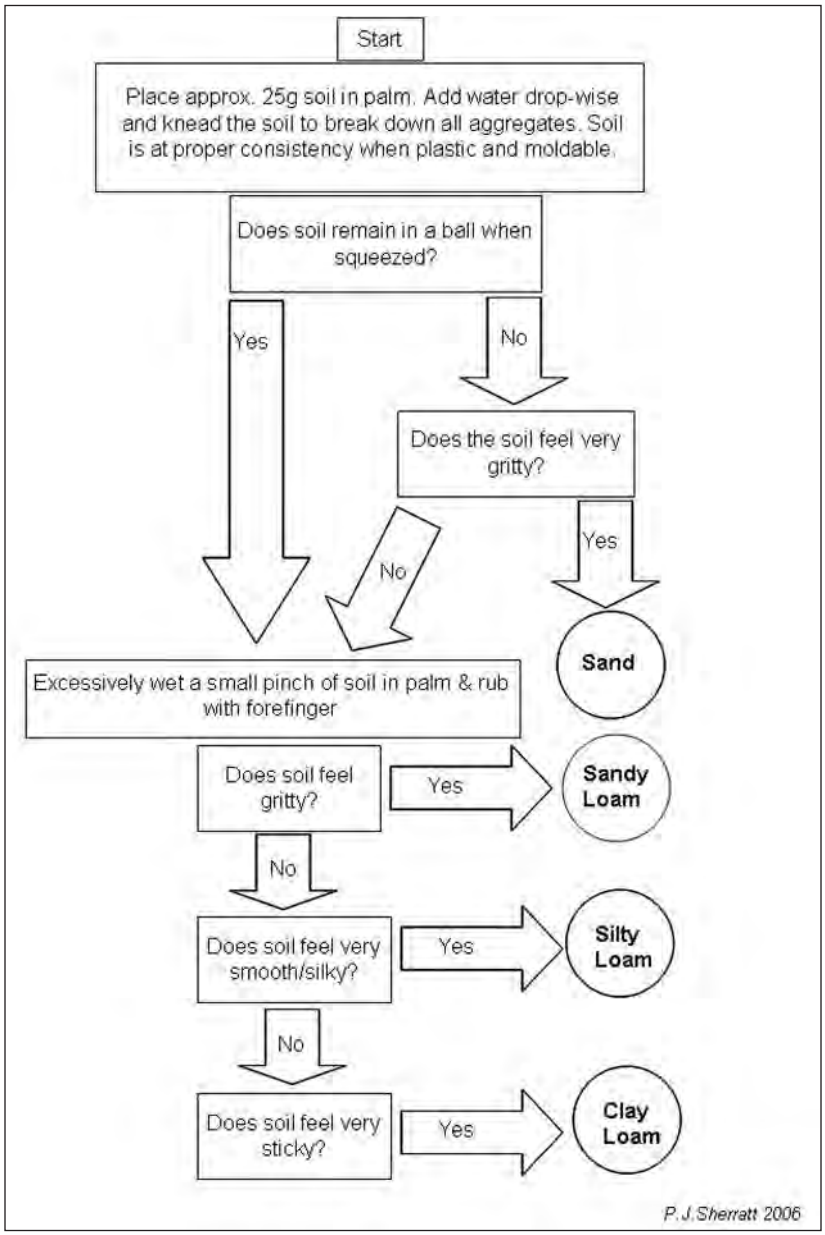




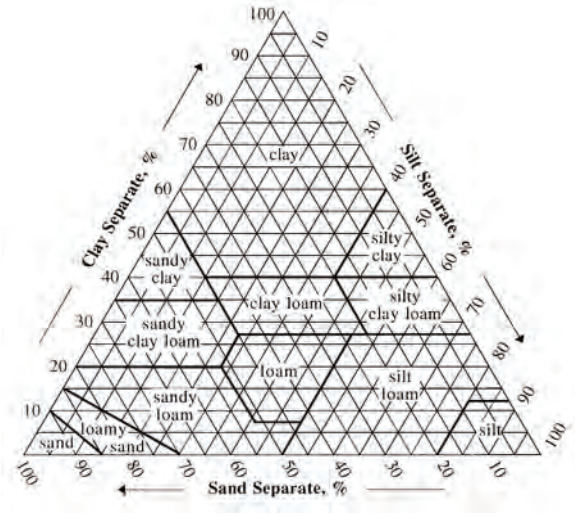
▲ **Figure 5:** Hand-texture test. The flowchart is easy to follow and results in a better understanding of what a silty, clay or sandy soil feels like.

The sand component of the mix should ideally be medium-coarse in size and uniform. In many situations, the sand component of the mix does not meet this specification and it is not unusual to see sand mixes that contain large amounts of silt and clay or gravel. Silt and clay particles are very fine and they clog a soil system. Air spaces are blocked and the soil becomes prone to compaction. When dry, silt and clay soils are rock-hard, but they turn to a quagmire when wet. For these reasons, very fine sand, silt and clay are generally restricted in mixes to less than 15% of the total mix.

There are no set guidelines for the amount of gravel allowed on a sports field but there is a landscape recommendation. ASTM D 5268-92 "Standard Specification for Topsoil Used for Landscaping Purposes" suggests that no more than 5% deleterious material (rock, gravel etc.) be included in a topsoil mix. Gravel is not a suitable material to improve soil physical or chemical properties and on a playing surface it can disrupt play and possibly cause player injury. In addition, gravel on the surface could damage mower blades and be very difficult to grow grass or seed in. For a whole multitude of reasons then, gravel should not exceed 3-10% of the total mix.

Unfortunately, this has not been the case in many situations. Site visits to sports fields over the years have shown that many topdressing mixes contain far too much gravel. In one notable instance, a college soccer field was constructed with a material that contained 44% gravel. That particular field had also been graded and then leveled with a vibratory roller, making it as hard and impenetrable as a parking lot. The ultimate

▼ **Figure 6:** The textural triangle. To plot sand, find the percent sand along the bottom and follow the line diagonally left. To plot clay, find the percent clay along the left edge and follow the line horizontally across from left to right. To plot silt, find the percent silt along the right edge and follow the line diagonally left. Example: Soil containing 30% sand, 30% clay and 40% silt would be a "Clay Loam."



goal of topdressing with sand is to achieve at least 70% sand by weight in the root-zone. At this point, the sand particles bridge, creating macropores and reducing particle density. Without a doubt, initiating a sand topdressing program significantly improves native soil field quality and longevity.

One way to ensure that topdressing material contains the right amount of sand, silt, clay and gravel is to carry out some DIY quality control. There are several easy ways to do this:

Firstly, avoid the temptation to accept any sand, just because it's free or cheap. Dressing fields with high amounts of gravel or silt and clay will probably make the fields perform a lot worse than before

Get familiar with what the sizes look like. Being able to distinguish between gravel and coarse sand can be helpful when taking delivery of an order (Figure 4)

Send a sample away to a soil testing lab to have a textural analysis done on the sand component. The lab will furnish results that state clearly the percent of fine, medium and coarse sand and gravel.

Carry out a hand-texture test (Figure 5). While not precise, it offers an idea of the type of soil in hand and it helps for the turf manager to become accustomed to what different soils feel like.

Perform a soil settlement test, sometimes called a "Jar test" (a good practice for baseball infield mixes too):

Take a small soil sample.

Quarter fill a water bottle or mason jar with the soil.

Add tap water until the bottle is three-quarters full.

Replace the lid and shake until the water and soil are thoroughly mixed.

Leave to settle for 2-3 days

After 2-3 days, the soil will have settled out into discreet layers, with the gravel and sand on the bottom, then the silt, and then the clay (being the smallest particle, clay settles last).

Measure the total thickness of the soil, then each individual layer, to determine what percentage sand, silt, and clay is present. For example, if the total mineral layer is 2 inches thick and the sand layer is 1-inch thick, there is 50% sand.

The sand, silt and clay components can be plotted against the soil textural triangle to determine soil texture (Figure 6)

One of the main issues with starting a topdressing program is that a topdresser is needed to apply the material, unless an outside contractor is paid to make the application. Also, the program is not a "one time" occurrence, but must take place each year, ideally in conjunction with aeration, which will take time and money. However, in every instance where a sand topdressing program has been adopted, the results have been so dramatic and the fields have improved so significantly that school boards and administrators usually look for extra sources of funding to try to start topdressing programs on additional fields.

It may take a couple of years to see the benefits of dressing with sand. Obviously, the more sand applied, the faster the desired 70% by weight goal will be reached. It is not a good idea to apply more than 0.25 inch at any one time as the sand can be abrasive to both turf equipment and the grass, but two or three applications could be made each year, outside of the playing season. If there is money and manpower available, a new "fast-track" sand build-up system could be employed. This system was recently developed by Michigan State University and can be accessed through their website.

In addition to improving the rootzone soil, there are several drainage options for fields:

Surface Drainage refers to the ability of water to shed or run off the surface due to the installation of a slope or crown. The severity of the slope or crown depends upon the amount of sand in the rootzone. Fine textured soils with <45% sand should have crowns/slopes of 1.5 - 2 % while rootzones with >70% sand can have smaller crowns/slopes of 0.75 – 1.0 %. For a more detailed guideline on this, refer to ASTM WK37583 – New Guide for Construction or Renovation of Native-soil Athletic Fields.

Internal Pipe Drain: The origin of this type of installation is in agriculture and it is relatively cheap to install. It consists of a grid of piping below the surface of the subsoil. The benefits are (1) the gradual lowering of the water table and (2) shorter drying time. However, this system is not accustomed to dealing with high volumes of water in short periods of time, such as during a game. Also the area affected by the drainage pipes is usually restricted to within a few feet or so of the pipes. The main objectives of pipe drainage is to lower water tables, control or cut off flow of extraneous water, and drain any surface water directed to them.. The disadvantages to this system are that the water must flow to the drains in order for them to be effective.

Slit Drains: Slit-drained fields are designed so that surface water bypasses the native soil, and the local soil has less of an influence on drainage rate. A common specification is to install sand slits 1-inches wide, 10-inches deep, on 3 ft. spacing (Figure 7). Most importantly, the slits must transmit surface water through the native soil surface to a more permeable material underneath - such as a gravel layer or permeable fill over pipe drains. The slits run perpendicular to the pipe drains. Two problems can occur with slit drained fields: (1) when the permeable material does not come into contact with the sand slit (i.e. there is a soil layer between the sand slit and the underlying permeable material), or (2) when the slit is not kept directly at the field surface and the slit is sealed off by adjacent native soil. This can occur rapidly, even during one game if field conditions are very wet. To prevent the latter, a heavy annual sand topdressing program has to be initiated to make sure that the slits are not "capped off" over time. Research by the STRI has indicated that these types of field can accommodate 6 hours adult play per week (95-125 events per season). In addition, they have suggested that, if managed correctly, a slit-drained field should last about 7 years before needing to be slit again.

Suspended Water Table (USGA, PAT system or similar): By far the most expensive of the options to install and maintain, the suspended water table (SWT) construction consists of internal drain pipe, a gravel blanket and a sand rootzone. The biggest benefit is that it resists compaction and has very high infiltration rates. The challenges are that they require greater input (water, fertilizer) and they can lose grass cover quickly from over-use if the sand is not stable, or if regular over-seeding and topdressing is not performed. Organic matter accumulation is also a challenge. Switching from a native soil field to a SWT field is not economically viable in many cases and can only really be justified from a financial point of view if play has to be guaranteed irrespective of the weather (except snow and frost).

OTHER NATIVE SOIL FIELD IMPROVEMENTS

Moving on from discussing the intricacies of removing water quickly from soil fields, adding water to soil fields is also an important part in native soil field improvement. Irrigation is undoubtedly the most underused management practices on native soil fields, especially during renovations or overseeding/sodding operations. It is highly unlikely that turf will recuperate from wear or that new seedlings will survive if supplemental water is not added to the field during drought (Figure 8). Even in Ohio, with 40-inches of precipitation per year, it is not uncommon to have drought conditions June, July and August.

Figure 7

▲ **Figure 8:** This new field was constructed in the spring and then not irrigated during the summer. The football season then had to be played at another location.

Adding water to a field does more than grow healthy grass, but can significantly reduce surface hardness on fine textured, dry and compacted soils. Dry and compacted native soil fields can have Gmax (hardness) readings in excess of 400, which is four times harder than recommended for athlete safety. And with the CDC reporting that 135,000 children between the ages of 5 and 18 are treated each year for concussion and other head injuries, it is best to make sure that the playing surface is not one of the contributing factors.

Guidelines for best management practices on native soil fields, like mowing, regular and timely applications of fertilizer, over-seeding etc. can be found through the STMA website or University turfgrass program website. For example, Ohio State has a free factsheet entitled "Standard Guide for Maintaining Sports Fields and Recreational Turf in Ohio." ■

Pamela J. Sherratt is the sports turf extension specialist for the turf program at The Ohio State University in Columbus.

JOHN MASCARO'S PHOTO QUIZ

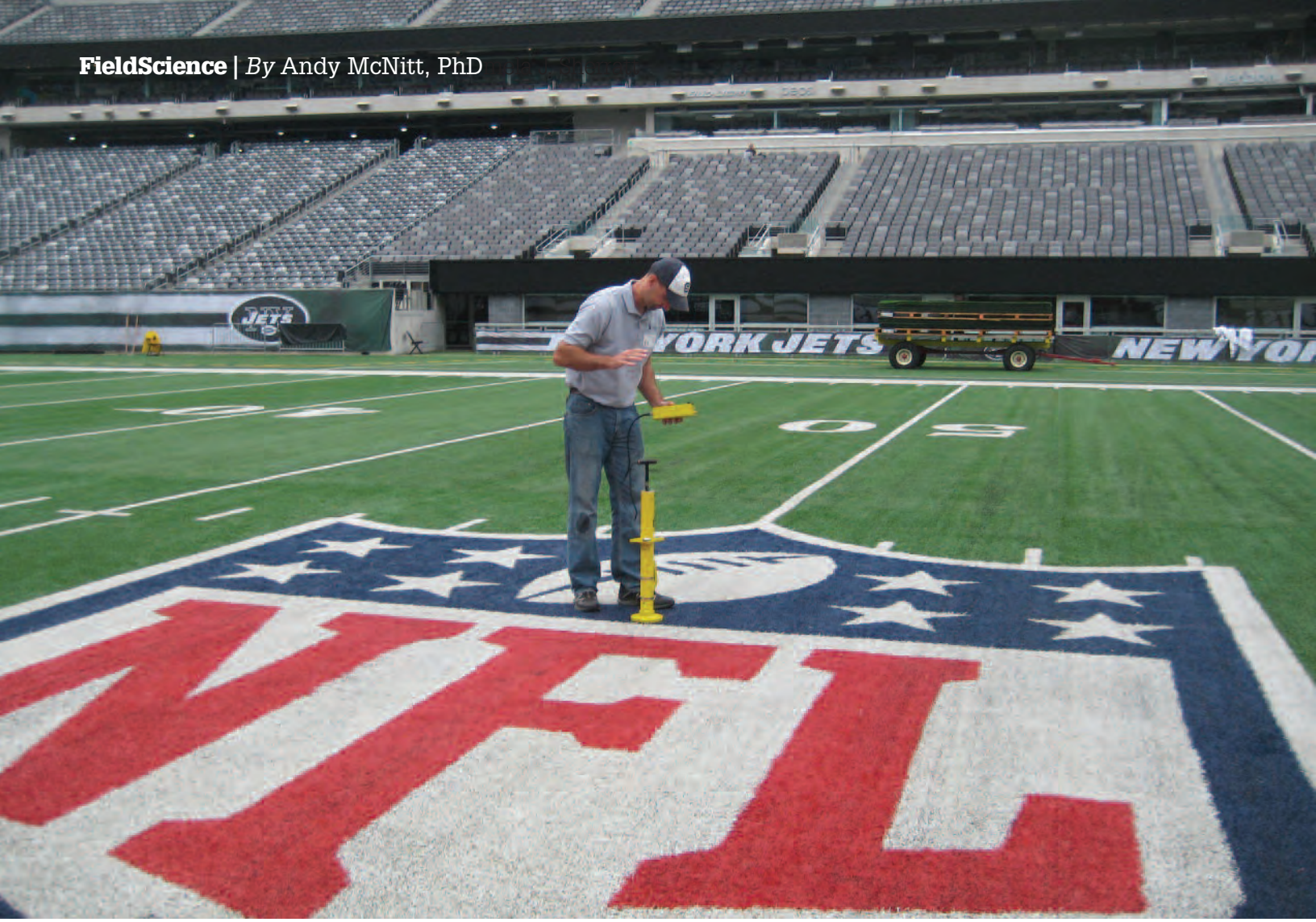
John Mascaro is President of Turf-Tec International

Can you identify this sports turf problem?

Problem: Stadium field has lines of melted snow from end to end
Turfgrass area: Major league soccer stadium
Location: Turkey
Grass Variety: Bluegrass/ryegrass mix

Answer to John Mascaro's Photo Quiz on Page 33

Background illustration courtesy of istockphoto.com



Issues and technologies used on NFL playing surfaces

I'VE HEARD IT OVER AND OVER AGAIN from those in the turf business: "If I could mow at one inch, I'd be able to have pristine looking turfgrass like in all these NFL stadiums." I politely reply that if those kinds of skills and knowledge existed anywhere, there would already be lots of smart people using them to improve these surfaces.

Let's review a few facts that aren't always in our frontal lobe while we watch an NFL game from the comfort of our homes on a late November Sunday.

First, it's November. It's getting seriously cold now and the light levels are extremely low. Think about the effects of "winter play" on a golf course.

Yes, most of the NFL's northern fields have an ethylene glycol heating system running under the sand rootzone. The heating systems provide some benefit by extending the growing season further into the fall and limiting frost development on areas that require painting; however, light is still limiting. The sun is low in the sky and the stadium seating is being placed as close to the playing surface as possible. This means very steep seats and significant shade. Yes, south facing endzones are sometimes built lower or more open but there are many fields where the sun never hits the field from the endzone through the 20 yard line in November.

In the fall direct sunlight is very limiting and if the heating system is used to push the turfgrass excessively, the turf becomes severely etiolated. Also, the heating system can push moisture to the soil surface. In theory, the ideal set up for an NFL football game on a sand rootzone is to have ample moisture in the rootzone but have it a little dry in the top half inch or so. When the heating system is running during cold weather, moisture in the rootzone is vapor-

▲ **Left: THE SUN** is low in the sky and the stadium seating is being placed as close to the playing surface as possible. This means very steep seats and significant shade. **Middle:** Artificial lighting systems have been developed and are being used in Lambeau Field in Green Bay. **Right:** Most stadia, save three, in the NFL are used for multiple and varied revenue generating and charity events that can find parts of the turfgrass covered for up to 7 days.

ized. It moves up through the sand and eventually encounters the cold air temperature where it condensates. This flips the moisture strata where now it is wet on the surface and dryer further down in the rootzone.

While a tremendous help, the heating systems are not a silver bullet for growing turf in cold conditions.

Light is a truly limiting factor in the fall and in some stadia throughout the season. Artificial lighting systems have been developed and are being used in Lambeau Field in Green Bay. Here at Penn State, we've been experimenting with a rollable light tarp. This system contains a series of LED lights in the wavelengths needed for optimal growth. The wavelengths can be varied to provide optimal growth conditions for particular species and in some instances for particular cultivars. We continue to work to get this system commercialized.

Besides limitations of light and heat well into the fall and winter, it's important to realize the tremendous amount of traffic/damage that occurs to these surfaces. Football fields look big when watching the game on TV. When you attend an NFL game the stadium is large and bigger than life. This subconsciously makes us multiply the size of the field. The field looks immense. Really, the majority of the game is played on a small area. Research has shown that for most games about 80% of the traffic occurs between the numbers and between the 20-yard lines. The area receiving 80% of the damage is about 15,800 square feet, or the size of about two and a half golf greens. Think about that for a moment.

Most stadia, save three, in the NFL are used for multiple and varied revenue generating and charity events. There are the NFL events, college football games, high school football games, the FOP versus the FOF charity event. Lacrosse championships, soccer tournaments and professional soccer events dot the schedule. Then in summer when the temperatures are sometimes extreme, the stadium hosts between one and three summer concert events and/or monster truck rallies where at least parts of the turfgrass may be covered for up to 7 days and other parts must accommodate large cranes, and countless passes with forklifts, trucks and other utility vehicles.

Considering the amount and kinds of events held on these surfaces, it's a testament to the field managers that they are able to provide a safe and playable surface week in and week out. Remember, there are no frost delays. Unlike baseball nobody stops playing for a little rain or even snow.

For those of you managing high school

▶ **ORGANIC MATTER** accumulation in the top couple inches of the surface can begin to act like silt and clog the macropores that conduct air and drainage water.

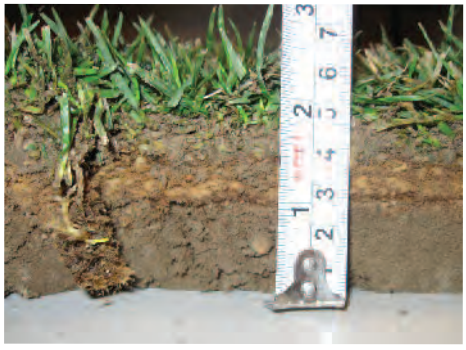
fields that host well over 100 events per year, the pure number of events may look unimpressive. You should realize that the kinds of events do differ. To give you a point of reference, when I evaluate the amount of damage caused by a Division I football game on a Saturday to an NFL game on a Sunday, it like the difference I observe on a high school field between a 7th grade game and a varsity football game. Seriously, the difference is dramatic. It's the size and speed of the players (Energy = Mass x Velocity). It's not how strong the players are, it's how fast they can move very large bodies. And when these large bodies have momentum and want to change direction, the shear forces on the turf system are tremendous.

On these higher-end sand-based systems, grinding out of the turf through abrasion is a secondary damage of the turf behind divoting. So the management philosophy of an NFL field manager and a high school field manager are different.

A high school turf manager caring for a native soil field receiving many, many events per week is trying to limit, and more importantly trying to constantly recover from wear due to abrasion and soil compaction. Thus, the turfgrass needs ample nitrogen to help it recover and should have a higher cutting height to help reduce the effects of abrasion. Aeration is done to reduce soil compaction.

On these higher-end NFL and college fields that have lower numbers of events, perhaps only two per week, but where the events are at a much higher intensity, maintenance practices vary. Research on Kentucky bluegrass grown on sand indicates that within reason a lower mowing height results in less damage due to divots. In the past, Beaver Stadium at Penn State was mowed as low as 7/8" and typically exhibited a low amount of divoting. A common mowing height for Kentucky bluegrass in the NFL is 1.25 inches although some are mowed at a lower height year round.

▼ **ALL BUT A HANDFUL** of natural grass NFL stadia resod at least 1.5 times per year and as many as four times per year, bermudagrass fields included.



During summer months, before the beginning of the football season, some nitrogen and water is withheld in order to "harden off" the bluegrass. Stressing the plants somewhat has proven to reduce divots compared to having succulent plants heading into the season. When the weather cools, additional nitrogen is applied in order to stimulate growth. Also, significant spring nitrogen applications are suggested during any cultivation or renovation procedures. Cultivation followed by core harvesting on sand rootzones is done to reduce organic matter buildup in the rootzone.

Organic matter accumulation in the top couple inches of the surface can begin to act like silt and clog the macropores that conduct air and drainage water.

Tom Serensits, manager of Penn State's Sports Surface Research Center, has done significant work using Primo on these sand-based fields. His research showed that if Primo is applied all growing season stopping sometime in early August, that a field can experience as much as a 20% reduction in divoting into November. You can watch a video of Tom's work by going to ssrc.psu.edu and selecting 'SportsTurfScoop' in the left hand menu.

Using all of these techniques often isn't enough to allow the turf manager to maintain a consistent turf stand. Thus all but a handful of natural grass NFL stadia resod at least 1.5 times per year and as many as four times per year, bermudagrass fields included. We have been working with sod companies to improve the quality of their sod for these in-season resod jobs. This has truly become a science. The team is on the road next week, so it is decided that the old sod will be stripped, new sod will be harvested and laid, and a game will be played on it 10 days later. Many of the techniques suggested above are employed in the sod field, before harvesting, to reduce the divot potential of newly laid sod.

Kentucky bluegrass cultivar selection is also a factor. Personally, I believe that Kentucky blue breeding is moving away from what sports fields need. I believe that the cultivars we used 20 years ago were more divot resistant than the cultivars today. We are looking for aggressive rhizome producers and typically those cultivars are poor seed producers and have been abandoned by growers in Oregon due to the low yields per acre during seed production. While today's cultivars are more attractive and more disease resistant, they are also more prone to divoting. We have begun to play with some old cultivars to determine their divot resistance and see if selections can be made in order to breed grasses specifically for these high-end sand-based fields.

Evan Mascitte, an MS candidate working in our project, has decided to seriously investigate the preharvest conditioning of sod to be used for in-season resodding. We'll be reporting on that work in another issue.

And remember: some of the best, in any business, are so good they make their jobs look easy, when in reality they are hard-working professionals performing well. ■

Dr. McNitt has been with The Pennsylvania State University for 30 years. Presently he is Director of Penn State's Center for Sports Surface Research (ssrc.psu.edu) where he conducts research relating to athletic field surface characterization and golf green construction and maintenance. Dr. McNitt is also the Program Coordinator for the 4-year turfgrass science major and the Basic & Advanced Certificate as well as the Associate, Bachelors, and Masters of Professional Studies Programs offered through Penn State's World Campus Online Learning. In 2010 he was inducted into Penn State University's College of Agricultural Sciences Academy of Teaching Excellence.

Field painting tips & disaster stories

- What 3-4 factors do you consider most important for efficient and successful field and logo painting?
- What is the worst painting disaster you've ever been involved with or seen happen?

MARTIN KAUFMAN, CSFM
Turf Managers LLC
Nashville, TN

Efficient and successful field and logo painting begins with: 1. Preparation; 2. Planning; 3. Observation; and 4. Focus (& double check).

The worst painting disaster I have been a part of is painting a 30 yard line from the west side of a football field to the 31 yard line on the east side of the field, letting it dry and not discovering the problem until I was painting hash marks on the east sideline. This game was on TV too.

ALLISON MOYER
Grounds Manager
Collegiate School,
Richmond, VA

Pre-paint by planning out on paper what needs to be painted. The colors needed, measurements of the logo and overall look of the project

Timing is crucial in getting a good logo. Give yourself plenty of time to complete the logo. Also, make sure you paint it in enough time for it to completely dry before players arrive. Check with coaches and find out practice/game schedules before you start. Wet paint on a field does not mix well with people walking all over it!

Equipment. Always check your equipment before beginning. Check rollers, paint, strings, & tapes are good and usable.

Patience. Don't get frustrated. It takes time to create a logo. Things will always turn out better if you do not get frustrated

On the coldest night of the year, I painted an Arena Football field on an outdoor regular football field. It happened to be a synthetic field that had that needed to be painted with embedded regular football hashes, numbers, & lines. After much discussion, the complex made the decision to paint the embedded hashes, numbers, & lines with green paint to cover them up and then repaint the correct lines for arena football. We tried to get a green as close as possible but in the end it looked tacky.

BILL CONNELL
Field Operations
Buffalo Bills

First, all equipment is in good working order (cleaned after last use, properly tuned, all parts, spray tips, etc., inspected.

Second, check weather, team schedule or any other source of disruption that would prevent the goals of the task from getting done.

Third, get proper amount of paint ready to go: mixing, cutting, and filtering.

Fourth, start job and be neat and precise. Don't get lazy or sloppy; be consistent from start to finish.

My worst painting disaster was painting the numbers college distance from the sideline (21 ft), not the professional distance (36 ft) from bottom of the template. I had to dye out wrong numbers during the night. This was a practice field, but a disaster to me none the less!

RYAN NEWMAN
Director of Athletic Grounds
University of Colorado
Athletics

First factor for successful and efficient painting is monitoring the weather. Try to get ahead of forecasted precipitation to make sure the paint dries before it rains. If you can avoid painting in windy conditions, this will minimize the amount of drift you have. Also, as the season progresses, we get colder temperatures and shorter days, so we start the painting earlier to ensure the paint dries in time.

The second factor, and probably the most important, is having a knowledgeable crew; they need to know proper field dimensions, painting equipment operation, and be on the same page with one another. There is a lot of teamwork involved in painting; most processes involve multiple team members so knowing what the other guy is doing and when he is going to do it and vice versa will eliminate most mistakes.

The last one is using quality paint and reliable painting equipment, and making sure the paint is mixed properly and consistently. Taking care of your painting equipment by properly cleaning it when finished will ensure reliability and functionality.

The worst painting disaster I've seen was when I was a student at Iowa State. We had a stand alone unit in the back of a cart and were moving from one end zone to another along the perimeter. We did not wind up the hose for the painter, we were just pulling it behind the cart. We made the turn at the corner and the hose snagged the nail holding the sideline string and it jerked the paint and painter right out of the back of the cart. The other one I witnessed; we had the painter in the back of a truck heading to one of our facili-

ties when the tailgate came down and the painter fell out at about 35 mph. The handle bars were bent a little, but it started up on the first pull and we painted the soccer field with it.

ABBY MCNEAL, CSFM
Director of Turf Management
Wake Forest Athletics

Make a good "game plan" for painting by setting the pathway to get things done with the group; this keeps everyone on the same page so they should know what comes next in the process to best be prepared in case things occur.

Have a clear understanding of the layout and/or the logo and take pictures of the logo and field measurements with you into the field to ensure that you put it in the correct location. The picture also helps to make sure that you paint the logo correctly. Field layout information also helps to make sure you have all the correct markings for that particular sport.

Make sure that you have towels and water as paint spills happen and you will need to be prepared to clean them up.

Take extra string, nails, and tape measures of varying lengths to help make sure you layout the field or logo correctly.

Take a picture of the final product to be proud and to learn from in the future (teaching tool).

Worst painting disaster I have seen is an NFL field with the arrows on the wrong side of the numbers. I won't say which one but it was about 15 years ago.

Worst painting disaster I was a part of occurred when paint was spilled onto synthetic turf and the employee flooded/washed the spill are with water. The waste water, diluted white water, washed into a local stream and was reported. We then had to provide information (MSDS and labels) to the fire department and environmental police. The employee did the proper thing by washing the spill out, just a lesson learned to know remember where things drain too. The fire department flooded the area with more water to help the situation.

BRETT TANNER, CSFM
Sports Turf Technician
University of Virginia

Use a clean and dependable painter. A good paint job starts with good equipment. Consistent cleaning and maintenance of your paint machine will help guarantee its performance when called upon. It's also good to have a backup plan as well, aerosol, 4 inch rollers, or even chalk if needed.

Understand and communicate what is being done and expectations. I try to gather everyone who will be involved during the painting process and go over the steps and the order in which we'll complete each one. I also print out diagrams of the field being painted including field measurements and colors of logos.

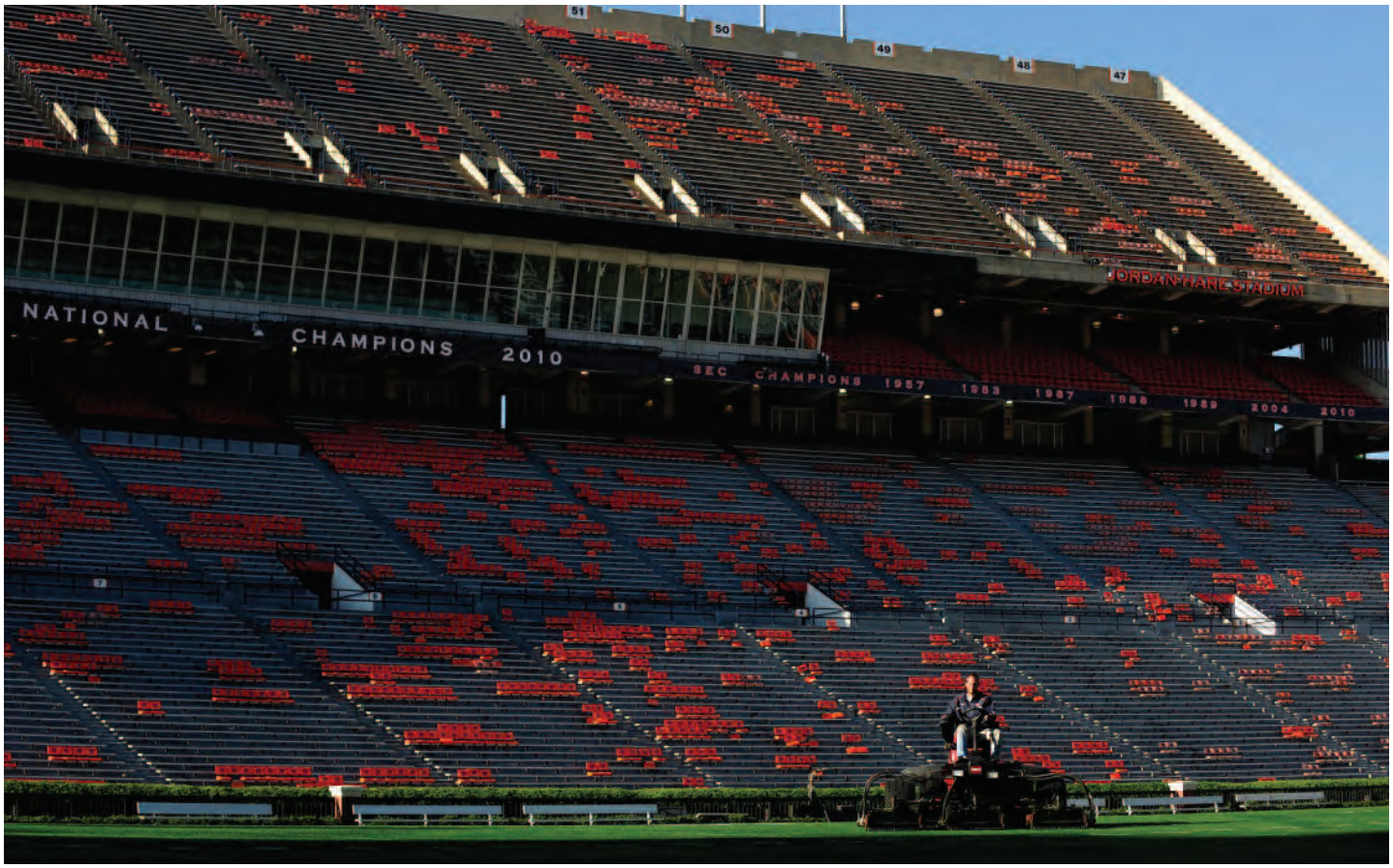
I always want to make sure we have enough time to ensure we take all the steps to provide the highest quality product possible. It also helps in the event of inclement weather, equipment problems, or reduced staffing.

I think I've been fortunate, if you're prepared and organized I feel that you can avoid most mistakes. Some of the "disasters" I have been involved with the occasional upside down 3, an arrow pointed the wrong way, or stencil burn from marking a logo in the afternoon on a hot day. You learn from those mistakes and take the appropriate steps to avoid them the next time.

KEVIN WHITE
Athletic Grounds Lead
Seattle University

1. Be prepared; make sure you have everything you need and it is ready to go before you start painting.
2. Pay attention to the radar (weather forecasts in Seattle are not always accurate!)
3. Double check the layout from the stands (or higher vantage point) just to make sure everything looks right.
4. Clean-up is just as important as setup!

My worst disaster happened a couple of years ago during our men's soccer home opener against the University of Washington. We had just purchased a new airless sprayer and wanted to use it for the first time to paint the field. Our men's and women's teams use our field for training and games, and because of scheduling we paint before each game so the lines are bright and crisp. We set up the sprayer and ran water through it the day before and thought we were good to go, but for some reason we couldn't get paint to come out of the tip on this day. We discovered we were missing the tip seal, but didn't have a spare and were running out of time. I managed to find an old aerosol sprayer and enough cans to at least put lines on the field (so I thought). Half way down one side, the cable breaks on the handle...I have 30 minutes left before the game kicks off, and I still need to paint AND wind up string. Needless to say, we now have spare everything, including a functioning aerosol sprayer and paint as a backup. ■



Gridiron maintenance challenges within the SEC

MEETING THE EVER-CHANGING MAINTENANCE NEEDS of college athletic fields must begin with a winning team of turfgrass managers. The grounds crew at Auburn University is well rounded with turfgrass management and horticulture graduates as well as former athletes who know how an athletic field should perform. The crew of seven full-time employees and six students is responsible for maintaining 15 acres of athletic fields, a 23-acre golf practice facility, and the landscaping around the athletic facilities. Directed by a graduate (BS and MS) of the Auburn Turfgrass program, Eric Kleypas, the crew fully understands the importance of football in the South, and especially in the Southeastern Conference (SEC).

With some of the best athletes in the country, delivering a safe and playable field is a must. Also it is important to keep the fields looking in excellent shape, as they are exposed to tens of thousands of live viewers and millions of eyes through TV coverage on Saturdays in the fall. And it doesn't end there: with a fierce recruiting race for the best players, it is important to keep the fields in excellent shape year-round. Add special events to the mix, and maintaining fields in the SEC can become extremely challenging.

Facilities used by the Auburn football team include natural grass at Jordan Hare Stadium, with a capacity of 87,451 fans, two natural grass practice fields, and one indoor artificial turf field. Tifway bermudagrass is the turf of choice and all fields are overseeded in the fall with perennial ryegrass to maintain playability and aesthetics throughout the winter. Depending on the time of year, mowing heights range from 5/8" to 7/8". For the majority of the summer, height of cut is at 3/4"and fields are mowed six days per week. Fertility requirements are met with a combination of slow release, polymer coated products and supplemented with quick release, soluble sources as needed. Summers are spent frequently core aerifying to alleviate compaction, remove logo paint, and slow organic matter accumulation.

▲ **MOWING** at Jordan Hare Stadium.

THE NEED FOR QUALITY TURF YEAR-ROUND

As with other schools in the SEC, recruiting has become a year-round process at Auburn, creating the need for pristine athletic fields 365 days a year. The turf

crew has been asked to transition from perennial ryegrass to bermudagrass in the spring/early summer while keeping the fields game ready for recruiting visits and summer camps.

Southern sports turf managers know and have been told by many experts that in order to maximize the health of bermudagrass, timely removal of the ryegrass in early spring is essential. Dense ryegrass stands can suppress bermudagrass growth and reduce development throughout the summer. Thus applying an herbicide is the most assured way to control the perennial ryegrass and encourage bermudagrass development. The problem with chemical removal is that we normally observe a 3 to 6 week period of low quality turf between perennial ryegrass death and bermudagrass development. Low quality turf is seen as a negative for recruiting.

The Auburn grounds crew has reached out to major league baseball groundskeepers to learn how they manage transitioning in the middle of a baseball season without using chemicals. After many conversations, the decision has been made use lower mowing heights, grooming, aerification, and soluble nitrogen to favor bermudagrass growth without a massive die-out of ryegrass. Mowing height is gradually reduced from 7/8" to 5/8". Vertical mowing occurs every other week as a groomer to remove ryegrass leaves and allow sunlight to reach the bermudagrass. Core aerification further thins the ryegrass canopy and increases sunlight into the soil surface. Light, frequent applications of soluble N supplement a slow release polymer coated urea application to favor bermudagrass growth.

The needs of recruiting make the effort to minimize the time frame of visible grow-in necessary. If unsuccessful, the final option would be to re-sod the football fields each spring for an instant transition.

▶ **THE SHADE LINE** created by construction of indoor practice facility on outdoor practice fields.

MANAGING SHADE ISSUES

Recently, the Auburn grounds crew inherited a new challenge in turf management. Completion of an indoor football facility created instant shade issues on the outdoor fields. Building the indoor field on the south end of the football complex allows the athletes to walk straight from the weight room to the field without going outdoors. While convenient for the football team, the indoor facility is

▲ **BEAUTY SHOT** of Jordan Hare Stadium, home of the Auburn Tigers.

not so convenient for maintaining the natural grass fields located to the north and west of the building. To make things even more interesting, the practice field to the west of the indoor facility also has a tree line on the opposite side of the field creating morning shade by the building and afternoon shade by the trees.

Irrigation zones are designed so that areas of adequate sunlight can be watered differently than shaded areas. Due to the angle of the sun, shade lines extend the farthest onto the fields in the winter and result in a poor stand of bermudagrass each spring. To determine the best strategies and/or bermudagrass variety for maintaining turf in the shade, the grounds crew has turned to the Auburn University Turfgrass Program for help. Auburn graduate student, Philipe Aldahir, is working on his second year of a research project testing bermudagrass varieties under different levels of shade, traffic, and overseeding to determine the best fit for the football practice fields at Auburn.

MORE HAPPENING ON THE FIELDS

For collegiate level turfgrass managers, the saying goes that "everything you see at the professional level will eventually trickle downhill." While game days are still the first priority, college football stadiums have evolved into multi-use facilities. At Auburn, the turf crew has witnessed several additional events at Jordan Hare Stadium. The field has been the venue for concerts, graduation ceremonies, autograph sessions, a finish line for 10K and half-marathon races, movie nights, television commercials, high school playoff games, and most recently, Café Jordan Hare.

For the 2012 football season, fans were allowed to attend three Friday night gourmet dinners on the field before the Saturday home game. The setup included tables, chairs, leather couches, serving lines, bars, grills, a jazz band, and the kitchen sink. The restaurant was purposefully set up on the home team sideline to allow turf damage to be covered by the sideline tarp each Saturday. The main challenge was moving all the furniture and food without damaging the turf. The turf crew started painting the field earlier in the week so that all paint was dry by lunch for the Friday restaurant setup. Irrigation was also adjusted to prevent rutting the turf while moving furniture for the dinner. Designs have been pro-

▲ **Left: CAFÉ JORDAN HARE**, serving Friday nights before Tiger home games! **Right: CELEBRATING AUBURN'S NATIONAL CHAMPIONSHIP** in 2010.

duced to install a roadway around the field to simplify setting up for Café Jordan Hare, as well as setting up the sideline equipment on game days.

COLLABORATING WITH TURFGRASS TEACHING PROGRAM

With increased events and new challenges each year, how does the Auburn grounds crew stay ahead of the game? Well, having a turf management program right down the road doesn't hurt. As mentioned, the athletic department has partnered with the turf program to develop research projects to help answer the challenges of maintaining athletic fields. The first project was to determine the best bermudagrass variety for shade tolerance that can handle athletic traffic. Future projects may include seedhead control of the bermudagrass varieties sold as shade tolerant grasses, infield skin research, and the relationship of spring moisture on bermudagrass transition.

Over the years, networking and discussing ideas with turf p sors has developed into an extremely valuable relationship. Whether the crew is properly indentifying a turf problem, researching new products on the market, or questioning a management practice, the Auburn professors are eager to help.

The most exciting benefit of Auburn's turf management program has been working with the students. Each year, six turf students work with the grounds crew to gain experience with routine maintenance procedures, game preparations, and working special events. Students provide much appreciated help to the full-time members of the grounds crew. In return, the students are able to gain valuable experience and transfer knowledge from the classroom onto the athletic fields at Auburn.

Recently, the Auburn crew has concentrated on placing the turf students in professional level internships. Relationships established among professional level groundskeepers have benefitted both the students and the full time members of the turf crew. The goal is for Auburn turf graduates to obtain desirable jobs within the sports turf profession and, in turn, create a beneficial networking community between the Auburn University grounds crew and former students.

For the turf crew at Auburn University, each year seems to bring new challenges. Networking has become a crucial skill to prevent mistakes when special events occur on the football fields. As bizarre as some of the events appear, someone else in the sports turf profession has faced something similar and can offer valuable tips to ensure success. In today's era of recruiting, any opportunity to promote your brand must be explored. Marketing strategies to maximize the fan experience will only bring more events onto the gridirons of the SEC. Turfgrass managers must take a proactive approach and communicate effectively to meet each challenge, while never compromising the safety and playability of the playing surface. ■

Eric T. Kleypas is Director of Athletic Turfgrass, Auburn University; Philipe C. F. Aldahir, is a graduate research assistant in the Department of Agronomy and Soils.

Maintenance & performance guidelines for synthetic turf fields

RECENTLY the Synthetic Turf Council (STC) published its "Suggested Guidelines for the Maintenance of Infilled Synthetic Turf Surfaces." The STC says routine maintenance, along with periodic intense maintenance, is essential to the life and performance of infilled synthetic turf. This maintenance manual provides owners and end-users with a way to realistically evaluate the maintenance recommendations for a synthetic turf surface, based on its intended use. To access the entire document, visit www.syntheticturfcouncil.org.

The STC says there are four key areas that drive the need for objective synthetic turf maintenance guidelines:

• Maximize the appearance and longevity of your synthetic turf. Improperly maintained fields will degrade faster and compromise playing conditions.

• Ensure maximum performance and playability. Proper maintenance is essential for the performance and quality of any synthetic turf system. Through a combination of regular maintenance and performance testing, it is possible to track the synthetic sports field's performance and anticipate the end of its useful life.

• Address field usage topics and special circumstances. Factors such as age, hours of use, type of use, climate, contamination and other situations impact the performance of the synthetic turf.

• Meet your field's warranty requirements. While a maintenance regimen can support the requirements of a warranty, the details of a maintenance plan should be carefully reviewed with the field builder to assure that it complies with and does not void any provisions of the warranty.

▲ **BAG OF DEBRIS** collected from the playing surface at Lucas Oil Stadium, Indianapolis.

Address field usage topics and special circumstances. Factors such as age, hours of use, type of use, climate, contamination and other situations impact the performance of the synthetic turf.

The information provided here focuses on infilled synthetic turf systems designed for sports fields. Please note that here a "field builder" is defined as the company having primary responsibility for installing the synthetic turf sports field, either directly or indirectly through a subcontractor or distributor, and providing the overall warranty for the installation and the field materials.

A field owner should take the following approach toward maintenance:

BEFORE YOUR PURCHASE

• Understand that no synthetic turf system is "maintenance free".

• Obtain the field builder's warranty and maintenance guidelines. Ask questions to understand the implications and requirements of each throughout the useful life of the synthetic turf.

• Discuss the anticipated usage of your field with your field builder. Obtain a maintenance plan that is designed for your field and its planned usage.

• Include in your purchase specific maintenance equipment, extra infill and repair materials (extra synthetic turf, seaming tape and glue).

• For synthetic turf fields with an irrigation system, consult an irrigation specialist to ensure that the system will not cause the field to become over saturated when irrigated. Only potable water should be used for irrigation.

• Design and locate the field to avoid contamination from adjacent areas.

• Ensure player walkways to the field are clean, and install a brush mat at the en-

trance. Where necessary, cross over covers can be used for player entry onto the field.

• Consider installing paved areas around the field to prevent contamination from nearby vegetation, spectators, maintenance vehicle tires, etc.

• If possible, locate the field away from sources of airborne pollutants, flood plains, and other problematic situations.

• Ensure that all surrounding surface water is directed away from the field.

• Understand who will perform the ongoing maintenance, including repairs and infill replacement, and its cost throughout the useful life of the field. The maintenance can be performed by the field owner with its own equipment and personnel, or outsourced to either a qualified maintenance firm or the field builder. If a third-party maintenance firm is to be engaged, make sure it is pre-approved by the field builder and it agrees to maintain your desired performance criteria.

• The field builder should confirm in writing before any maintenance work is performed on the field that the ongoing maintenance program, service provider, and maintenance equipment are acceptable, comply with and will not void any warranty provisions.

ACCEPTING YOUR NEW FIELD

Field owner personnel should be trained on the synthetic turf warranty, the field builder's maintenance guidelines and these STC Maintenance Guidelines. Training should include information about the specific components and materials of the installed system, the proper use of the synthetic turf maintenance equipment you will be operating, and the steps to ensure that optimal benefits are obtained while satisfying warranty requirements.

After a period of several months of initial use of the field and rainfall, the infill material will settle into the synthetic turf. During this period, more frequent brushing may be advised by your field builder. Once settling occurs, check the infill depth for consistency around the field and to ensure it is within the field builder's guidelines.

Conduct any on-site field testing by a recognized third-party lab that may have been specified during the purchase or bid process to determine if the field meets desired performance criteria. This will help benchmark the performance characteristics of the field when it is new against test results taken throughout its useful life.

PROTECTING YOUR FIELD

• Establish signage and local rules for the use of the field to avoid field contamination and damage.

• If the field is in a flood plain, cover it when the threat of flooding exists with a specialized tarp designed to limit silt and debris from contaminating the field surface.

• Encourage coaches and players to rotate activities to different sections of the field to prevent high wear areas.

• Provide trash and litter containers on site and make sure there are enough containers to eliminate overflow.

• Route field access traffic in such a way as to minimize the tracking of mud and dirt onto the field.

• Set up drinks for players during practice breaks off of the field, if possible.

• Do not perform any maintenance or other activity that may invalidate the warranty.

• Report any field damage to the field builder immediately. Damages need to be immediately repaired to avoid an escalating problem.

• Plan to perform the maintenance recommended by your field builder. In terms of time, you should budget 1 hour of inspection and maintenance for every 10 hours of playing time.

• Ensure a maintenance and activity log is maintained. This is often required by the warranty. It is important that each and every maintenance operation, no matter how minor, be recorded in the log.

Please ask your field builder for a form, but in general, the following information should be logged: type of Activity during week; estimated number of hours used during week; average number of participants per hour; type of maintenance activity performed; remarks/notes; and signature of maintenance supervisor

ONGOING ROUTINE MAINTENANCE

• The basic components of effective, routine maintenance are to:

• Conduct inspections and perform minor repairs to avoid playing hazards.

• Keep the playing surface clean and free of debris and contaminants.

• Check and maintain proper infill levels to provide a consistent surface.

• Brush the surface to preserve appearance, keep grass fibers upright, and maintain even infill levels, making sure to use only approved bristles that will not overly abrade the fibers.

• Maintain a maintenance and activity log.

A maintenance person should walk the field daily and conduct more detailed inspections according to your field builder's recommended schedule. To avoid permanent damage to your synthetic turf or safety hazards, check regularly for and address such critical items as foreign debris, low infill levels, open seams, etc. Pay special attention to the most heavily used areas, such as midfield, goal mouths, corner kick areas, etc. Add new infill or redistribute migrated infill, where necessary, to the recommended depth. Look for foreign debris or contamination.

Check seams and joints where panels or any field markings are joined together. Open joints can create a tripping hazard and should be immediately repaired. An open joint of 12 inches in length or less may not be an indication of seam failure. Discuss with your field builder in advance for self repair techniques and if self-repairs are recommended. Note that open joints of greater than 12 inches in length should be reported to and reviewed with your field builder. Note any deteriorating grass fiber or infill conditions, visual or excess wear concerns, drainage concerns, performance concerns, etc. and report them to your field builder.

KEEP THE PLAYING SURFACE CLEAN

• Remove all waste items regularly. Sweepers can assist in this process. Every loose foreign object, no matter how small, can damage your field by abrading the grass fibers and/or contaminating the infill.

• Remove airborne contaminants, such as leaves and other debris. If allowed to remain on the surface for any length of time,

they will migrate into the system, inhibiting drainage and causing infill compaction. Consider covering the field with pre-approved tarp when it is not in use.

• Remove organic material, including animal waste, as soon as possible to impede the growth of algae, weed or moss growth. Leafy trees should not be located next to a field, if possible. Brushing will help deter organic growth, as will the use of approved fungicides and anti-bacterial treatments.

• Don't allow food, sodas, chewing gum, sunflower seeds, chewing tobacco, smoking, etc. on the field.

• Do not use cleaning chemicals containing alcohol or acetone solvents. Chemicals should not be used without consulting with your field builder. Take care to avoid spilling any petroleum-based liquids including fuel onto the surface.

MAINTAIN PROPER INFILL LEVELS

The proper amount of infill is vital to the performance of the field. Infill also protects the grass fibers from damage, and helps keep them upright. Ask your field builder for the recommended infill levels. Be aware that:

• High use areas are prone to greater infill displacement.

• Brushing, drag mats, and proper rakes can help redistribute infill evenly.

• Infill may accumulate at the edges of a field. If so, clean the material prior to brushing back into the main field.

• Replacement infill should meet the field builder's specifications.

• Using an infill depth gauge or a nail and tape measure on a grid pattern is the preferred way to measure infill depth and consistency.

GROOM THE SURFACE

Regular brushing is an important function that must not be overlooked or neglected. Brushing helps to maintain uniform infill levels, keep the grass fibers upright, remove debris, and improve the field appearance.

Conversely, the flattening of grass fibers can create a possible acceleration of wear as well as reduced field performance. While grooming, inspect the field for unsafe conditions. Use a static brush for general infill leveling and to stand up the grass fibers. A mechanical sweeper or other specialty synthetic turf cleaning equipment should be used to remove surface debris. Do not use maintenance equipment before receiving proper use and safety training. Use only equipment and vehicles that are approved by the field builder. Use only synthetic fiber bristles of recommended stiffness. Do not use metal or wire bristles. Do not use 6-wheel vehicles.

Using an average all-purpose vehicle, brushing a standard sized multi-purpose field takes about an hour. The vehicle speed should be low and sharp turns must be avoided. It is most effective to brush the surface when it is dry. The high-wear areas will require additional attention as these zones will obviously have the most disrupted infill and pile flattening due to the intensity of play.

The surface should be brushed in a number of directions, alternating the direction in consecutive activities, but generally in the direction of the individual panels to avoid crossing over the main seams. On different days, start at different locations so as to alternate the brushing direction for each panel.

The optimum brush height setting will depend on the model and type of equipment. Do not set the brush so low that it digs into the turf pile or backing. Too low a setting can damage the turf, the seams and disturb the infill. Ask your field builder for the recommended grooming frequency. In general, the frequency will be related to the intensity of use; however, excessive brushing can cause fiber damage which over time will compromise the field's performance characteristics and longevity.

COMPREHENSIVE MAINTENANCE: SEMI-ANNUAL TO ANNUAL

Over a period of time, the following situations may arise which will require the need for more comprehensive maintenance: grass fibers become significantly bent, creased and flat; the playing surface becomes hard and compacted. While common to infilled systems, this impacts the players and also can create drainage issues. Dirt, debris and metal accumulate on or within the system despite routine maintenance. Seams become loose or panels shift creating a safety hazard. Infill levels become uneven, particularly in high wear areas, such as in front of soccer goals. This will impact player biomechanics and surface consistency, and will provide inadequate support of the grass fibers. When these situations or other concerns arise, contact the field builder and/or a third-party maintenance contractor approved by the field builder.

Comprehensive maintenance generally includes the use of specialty maintenance equipment by trained maintenance professionals. Depending upon the situation, the following actions may be performed:

Professional field inspection and corrective action. Assess the field surface, especially heavy wear areas, identify weak or loose seams and inlays, and repair the damage. Sport performance testing may also be desirable.

Decompaction of infill. Infill decompaction is important for improving shock absorption and synthetic turf drainage. Use only equipment specially designed to decompact and create loft in infilled synthetic turf systems.

Redistribution and leveling of the infill. Measure infill depth on a grid pattern, and add and level infill as needed to return the surface to the field builder's specifications.

Deep Cleaning. Use special equipment

that combines mechanical brushing, suction, and an infill return system to remove surface debris and embedded contaminants.

Metal removal. Use a magnet attached to your maintenance equipment to remove ferrous metal objects from the field.

Weed and pest treatment. Treat with herbicides or pesticides, as required.

Partial removal and reinstallation of infill material. Remove the infill, as necessary, to get rid of embedded foreign matter that has contaminated the infill system, relieve grass fibers that may be trapped in the infill, or improve drainage.

FIELD REJUVENATION—AS NEEDED MAINTENANCE

As fields mature, the accumulation of unwanted or foreign contaminants is inevitable, especially deep within the infill layer. Events, such as flooding or dust storms, may introduce extreme levels of contamination.

This may cause surface hardening and water permeability issues, and compromise field performance. When a field begins to show signs of deep compaction, such as g-max readings that exceed desired levels or significant drainage issues, full field rejuvenation may be desired. These maintenance services are performed using specialized field rejuvenation equipment and personnel and may include: removal of the vast majority of dirty and contaminated infill; untangling matted and compacted fibers; a combination of re-installation of new infill and/or the cleaning of the original infill; and removal of dust, debris and application of a disinfectant to treat for bacteria, if the original infill will be processed and cleaned.

SPECIAL CIRCUMSTANCES—AS NEEDED MAINTENANCE

While not intended as a complete list, the Synthetic Turf Council wishes to provide guidance on certain special circumstances which may require solutions on an "as needed" basis.

Field Markings: Temporary paints can be used if formulated specifically for synthetic turf. Ideally, paint should be applied only to the turf fibers, and not into the infill; although this will not be possible if infill levels are too high. Remove and reapply paint after a maximum of four applications to avoid hard-to-remove build-up.

Service companies with specialized equipment are available that can paint and remove lines, logos, end zones, graphics, etc. Permanent lines, logos, etc. can age differently than the playing field turf. They may harden or shrink at different rates that will affect Gmax. Special grooming or other techniques may be required.

Heavy Rain: If significant ponding occurs after heavy rainfall, it may be an indication of a variety of factors, such as clogged or damaged underground drain pipes or discharge outlets, base unevenness, debris in the infill, or infill surface tension. For infill surface tension, a field builder approved surfactant or laundry fabric softener can be used to break the surface tension allowing the turf to drain. After heavy rainfall, it is advisable to check the infill levels in case of migration with the field slope.

Snow and Ice: Generally snow and ice should be left to melt and drain off the system without assistance. At times, however, it is necessary to remove snow or ice to make the field playable for a scheduled event. The working principle for removing snow is to do so as near to game time as possible. This reduces the likelihood of new snow build-up and will reduce the risk of ice from cold winds whipping across a damp, newly cleared surface. Because ice and wet snow removal is particularly difficult, it is important that you take measures to prevent the build-up of ice and wet snow. Use only pneumatic tires on equipment used for the removal of snow and ice. If a snow plow is used, make sure the blade is guarded with PVC pipe and corner elbows or rubber tips, and the height is adjusted to leave ¼-½" inch of snow on the surface. This is to avoid surface damage. The remaining snow should be left to melt in the sunlight as brushing the remaining snow may also remove the infill. Avoid using a tarp on the field during freezing weather.

Tarps, unless vinyl or poly-coated, can freeze to the surface, and will be very difficult to remove.

In some cases it may be necessary to use a weighted lawn roller over the field to break up ice. The broken ice can then be swept off the field. Generally, if the sun is out and the ice or frost is not excessive, it tends to melt rapidly, especially when players are on the field.

Static Electricity: Surfactants like liquid laundry fabric softeners can reduce static electricity.

Stain Removal: Most stains can be removed easily with a solution of hot, but not boiling, water and a field builder's approved household detergent. Brush the stain with a stiff bristle brush, scrub the area with soap and water, rinse with clean water, and pat dry.

Equipment Leaks or Spills: Prevent leaks or spills by checking equipment and its components thoroughly before use on turf; do not fill fuels, oils, fluids while equipment is on the field. Wipe any excess grease from any/all fittings. Petroleum-based spills can damage the synthetic turf. Use only the newer biodegradable fluids, if available for your equipment. Don't use petroleum-based fluids. Check with the equipment manufacturer to verify the biodegradable fluid is compatible with the equipment and its warranty. If a leak occurs when using petroleum-based fluids it is important to minimize the damage by stopping and capturing as much fluid as possible. If it gets on the turf, use spill leak towels to soak up the majority of the fluid. Vacuum out the infill in the affected area, use a solution of household dishwashing liquid and water to break down and clean any remaining fluid from the turf. Once the turf is clean, you will need to install new infill.

Gasoline and diesel: Don't fill equipment while it is on the turf. Do not overfill. Newer equipment has an overflow tube that drains directly under the equipment and onto the ground. Use a catch pan while filling to prevent accidental spillage. Use

grease sparingly and wipe any excess off of all fittings, bearings, chains, etc.

REMOVING FOREIGN OBJECTS AND CONTAMINANTS

Chewing gum can best be removed by using either ice or an aerosol to freeze the gum, which can then be chipped or broken off the turf fibers. If gum has been smeared across fibers, peanut butter will soften and breakdown the gum so that it can be wiped off.

Sunflower seeds, peanut shells, pistachio shells, etc. should be removed as soon as possible by using a hand held or back pack blower. To minimize or eliminate the movement of infill, do not point nozzle directly into the turf. Use minimal throttle to decrease the volume of air.

Metal objects should be picked up by a magnet that is attached to grooming and brushing equipment.

Moss, mold, or algae may appear in underutilized areas of the synthetic turf, particularly if it is in shade and damp. Specialty products are available to treat these organisms and fungi; consult your field builder. If moss, mold, or algae are allowed to harvest and spread, the field may need to be rejuvenated.

Weeds are easily removed by hand if the infestation has not become too excessive. Treatments are also available.

USE CONSIDERATIONS

It is very important for a field owner to understand that certain activities, use and other circumstances may impact the field quality, wear and tear, appearance, warranty and performance of a synthetic turf field. If any doubt exists, the field builder should be consulted. The following are some of the suggested considerations for the field owner:

• Make sure in advance any maintenance equipment, personnel, techniques, repairs and materials comply with the field builder's specifications and warranty.

• Verify that the design, synthetic turf system and maintenance specifications will result in the desired performance outcomes prior to selecting your provider.

• Monitor the performance of your field throughout its useful life with periodic field testing and frequent inspections.

• The following may damage the synthetic turf: accidents, vandalism, spiked shoes, animals, wire brushes, fires, fireworks, floods, chemical reactions, acts of God, the use of dry cleaning fluids or improper cleaning methods, high pressure sprays exceeding 500 psi, storage of heavy materials on the field; non-approved infill materials, and non-approved artificial lights.

• Certain activities may damage the synthetic turf such as bicycle traffic, track and field events, golf activities, concerts, etc. Special events and activities should be reviewed with the field builder before the event occurs to ensure that damage is not done. You should also consider consulting with a company that sells field protection.

• The quality of the sub-base will directly affect the appearance and performance of the synthetic turf system. Select a base contractor only after carefully checking synthetic turf experience and capabilities. Significant importance should be assigned to grade, stone quality, drainage, etc. If the base is compromised, then the surface will be compromised.

• Footwear. Suitable footwear should always be used. Metal spikes should be prohibited and cleats are preferred. Flat-soled rubber shoes greatly intensify the wear and tear on the synthetic turf.

• Use patterns. It is very important to spread the field use to various locations on the field to prevent uneven or accelerated wear in certain areas.

• Vehicles. Do not park vehicles on the field, especially in the heat of the day, or leave vehicles on a wet or hot field for long periods of time. Engine exhausts should not be faced down toward the playing field, and a hot muffler or exhaust pipe should not touch the surface. Use lighter vehicles with LGP (Low Ground Pressure) tires with round edges to prevent rutting. Do not use cleated or traction tires. Heavy vehicles (over 300 pounds) should have a maximum tire pressure of 35 psi. Make wide, not sharp, turfs, and only when the vehicle is in motion. All vehicles should move at slow speeds. All vehicles should move at a slow speed. Avoid abrupt and sudden braking, as well as sudden acceleration or spinning of the wheels, especially on wet surfaces. Consult the equipment manufacturer to learn load limits. All vehicles must be checked before use on the field to determine if they are leaking oil or gas. If so, they should be repaired before entry onto the field.

• Concentrated heavy use protection. Stage or other set-ups for special events or activities, such as graduations, are normal. Proper field protection of the synthetic turf must be provided to prevent damaging it. Use plywood, interlocking plastic panels or similar weight distributing materials under all chairs and tables; consult the field builder or a field protection company. Use field protection that does not have a dimensional profile, e.g., corrugation, because the profile will transfer onto the turf and require heavy grooming to remove. It is imperative that no anchoring spikes, posts or footing be driven into the turf. Once the field protection is removed, the area should be groomed and swept with a magnet to remove any misplaced or dropped nails, screws, etc.

• Helicopter landings may be necessary to remove an injured player, for example; the rotor wash will likely cause infill to be displaced. As soon as possible evaluate the area and groom or brush as needed.

• Protect the synthetic turf as needed with approved tarps when nearby renovations, e.g., running track recoats or installations, cleaning or painting of bleachers, construction or repairs to lighting, renovations of adjacent natural turf fields, etc., may cause harm to the synthetic turf. Contact the field builder for a protection recommendation. Improper plastic protection will cause heat damage.

• Prevent heavy equipment from accessing the field or, if necessary, cover the field with appropriate protection to distribute the weight of the equipment.

DISCLAIMER

Due to the unique situation of each synthetic turf installation, other considerations may arise that are not addressed by these guidelines. Such considerations should not be ignored or minimized, but should be addressed by your field builder or industry specialists. This document does not in any way, imply, suggest or guarantee that a warranty, environmental, or performance issue could not arise if these guidelines are followed. These voluntary guidelines are not standards, and are not to be used as the basis for warranty or other claims. ■

JOHN MASCARO'S PHOTO QUIZ

Answers from page 17

I COULD NOT RESIST having a snow photo in July! This stadium field has lines of melted snow from end to end but the real problem is not the melted snow, it's the fact that some of it is not melted. When the director of maintenance arrived at this facility, there were several problems that were apparent and some were not as apparent. When this snowfall was observed on the field from the upper deck, the director of maintenance noticed that the electric undersoil heating system was not working correctly. The club previously thought that poor management was responsible for uneven discoloration of the grass. As it turned out, portions of the field were not being heated during cold weather these areas would turn off color while the areas where the filed heating was working properly remained green. It turned out that the electric heating cables buried about 8 inches deep had been damaged at some point, causing all of these problems. To correct the problem, the entire pitch and construction profile will be replaced in summer 2013. The heating system will also be replaced with water based pipes and a boiler system. ■

Photo submitted by Phil Sharples, Director of Maintenance, Eastern Europe for SIS (Support in Sport) based in Istanbul, Turkey.

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

Mobile Weed Manual: *A New Resource for Turf and Ornamentals*

HERBICIDE SELECTION is an important step in effectively managing weeds throughout the landscape. Individuals caring for ornamental plants as well as warm- or cool-season turfgrasses can face unique challenges in selecting herbicides for weed control. Weeds that persist in ornamental areas are often different from those found in turfgrass stands. Additionally, desirable ornamental plants found throughout the landscape can be quite diverse and thus exhibit variable tolerance to herbicide applications. Lastly, many herbicide products labeled for use in turfgrass are not labeled for use in ornamentals and vice-versa. All of these factors make the process of herbicide selection in turf and ornamentals quite challenging.

Figure 1 - Mobile Weed Manual (http://www.mobileweedmanual.com) is a new turf and ornamental weed control resource.

WHAT IS MOBILE WEED MANUAL?

The University of Tennessee Turf & Ornamental Weed Science Team has developed a new resource to help green industry professionals meet this challenge. Mobile Weed Manual is a new mobile website (www.mobileweedmanual.com; see Figure 1) to assist practitioners selecting herbicides for use in both turfgrass and ornamental areas. The site contains weed control efficacy data and turfgrass and ornamental tolerance information for over 2,300 different species, as well as labels for nearly 100 different herbicides; all of which are optimized to be easily accessible from the palm of one's hand.

HOW DOES MOBILE WEED MANUAL WORK?

Mobile Weed Manual is a mobile website that will work on any mobile device (i.e., smartphone, tablet, etc.) regardless of manufacturer or operating system. The site will also function on a desktop or laptop computer; however, it was designed for use on devices with touchscreen capability.

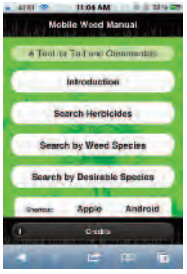


Figure 2 - Mobile Weed Manual provides three options for selecting herbicides.

Mobile Weed Manual offers users three means of selecting herbicides for weed control (Figure 2):

Search by Herbicide. This option is designed for individuals curious about what products are labeled for preemergence (PRE) or postemergence (POST) weed control in either turfgrass or ornamentals, regardless of species. How could this be useful? Select PRE herbicides for turf and the site will populate a list of all active ingredients labeled for PRE weed control in turf. Interested in POST weed control in ornamentals? This function will populate a list of all products labeled for such use.

Search by Desirable Species. This option is designed for individuals curious to know what herbicides are labeled for PRE and POST weed control in or around the specific turf/ornamental species that they manage. For example, this option would allow a lawn care professional to view a list of all the herbicides labeled for PRE weed control in tall fescue turf or determine products labeled for POST weed control in a species of *Liriope*. The opportunities are endless.

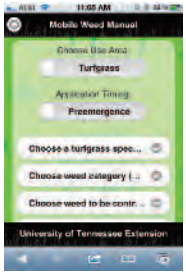


Figure 3 - Search by Weed Species function of Mobile Weed Manual

Search by Weed Species. This is the most powerful function of Mobile Weed Manual. This function allows user to select herbicides to control a specific weed growing in a particular species of turf or ornamental planting.

The steps are simple (Figure 3):

- Select a use area (i.e., turf or ornamentals)
- Select a type of application (i.e., PRE, POST)
- Select the desirable species (i.e., the type of turf or ornamental planting in which weed control is needed)
- Select the weed type
- Select the specific weed to be controlled.

These steps serve as filters to narrow down the 100 different herbicides and 2300 different plant species to best fit the situation of interest. All of these filters must be completed for the site to function properly and provide correct herbicide recommendations. Users will be alerted in the event they omit required information.

The site will then populate a list of herbicides labeled to control the weed selected. Herbicides are color coded according to the level of control that can be expected by an application made according to label directions (Figure 4). These rankings are based on the results of research trials conducted at the University of Tennessee. It is important to note that it is impossible to research the efficacy of every herbicide for control of every weed that could possibly invade a landscape. Thus, herbicides coded gray are labeled for control of the weed selected but have not been evaluated in research trials at the University of Tennessee. Within each color code, herbicides appear in alphabetical order by trade name.

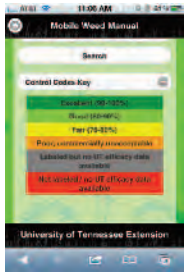


Figure 4 - Color-coding of herbicides corresponds to expected levels of control

Figure 5 - List of herbicides populated from a Mobile Weed Manual search.

Figure 6 - Additional information on a particular herbicide

Users can select a particular product from the list to access additional information about how to best use this herbicide for weed management (Figure 5). Mobile Weed Manual will populate a page that provides users information on the full

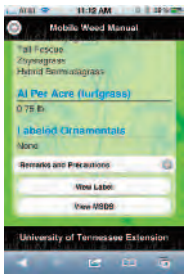


Figure 7 - Links to herbicide label and MSDS information

array of turf and ornamental species listed on the product label, suggested application rates, and remarks and precautions to adhere to before applying the product (Figure 6). Lastly, this page will contain links to each product's label and material safety data sheet (Figure 7). It is always the herbicide applicator's responsibility, by law, to read and follow all current label directions for the specific herbicide being used.

HOW TO ACCESS MOBILE WEED MANUAL

Simply visit www.mobileweedmanual.com using the internet browser on any mobile device. It is recommended that individuals bookmark the site and create a shortcut to it on their home screen (Figure 8). There are directions on the Mobile Weed Manual home page to guide users through this simple process. Creating a shortcut on the home screen will facilitate faster access to Mobile Weed Manual content in the future.

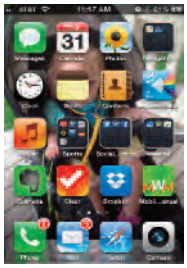


Figure 8 - Mobile Weed Manual shortcut on the bottom right-hand side of the home screen on an iPhone.

At the current time Mobile Weed Manual is a free resource. Should users find value in the content provided, they can donate funding (in an amount of their choosing) to support continued development of this new weed control resource. Donations can be made by selecting the "Support" button on the Mobile Weed Manual main page (Figure 9).

The University of Tennessee Turf & Ornamental Weed Science Team hopes that Mobile Weed Manual becomes a valuable tool for all green industry professionals managing weeds. The site will be updated continually to expand the database of turf, ornamental, and weed species information, as well as to include information on new herbicides entering the marketplace.

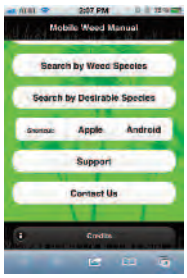
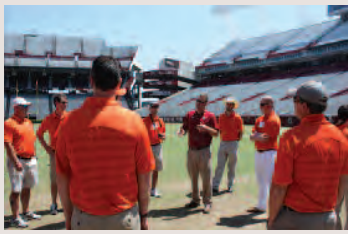


Figure 9 - Support link for users interested in donating funding to support continued development of Mobile Weed Manual.

Since debuting online in May 2013, the site has been used by individuals managing turf and ornamentals in all 50 United States and 44 countries worldwide. Our hope is that Mobile Weed Manual use expands even further in the future.

Please send any questions, concerns, or comments on Mobile Weed Manual to info@mobileweedmanual.com. Also be sure to stay in touch with the University of Tennessee Turf & Ornamental Weed Science Team at http://tennesseeturfgrassweeds.org ■

FUTURE TURF MANAGERS EVENT PREPARES STUDENTS FOR SUCCESSFUL FUTURE



▲ **Top: ABBY MCNEAL**, CSFM, Director of Turf Management at Wake Forest University, gives the group an overview of the STMA and shares some advice about ongoing training and player expectations.

Bottom: CLARK COX, CSFM, University of South Carolina Sports Turf Manager, shares his experiences and challenges of managing turfgrass in the transition zone.

Last month Jacobsen hosted more than 20 college seniors from top turfgrass programs around the world as part of its annual Future Turf Managers event.

The annual event gives students a unique opportunity to experience professional turfgrass management at the highest level. During the 3-day event, students visit with top sports field managers and golf course superintendents, hear leading-edge presentations from top universities and get an insider's look at Jacobsen's turf maintenance equipment.

Attendees must be recommended by directors or professors at turfgrass programs. Students were selected from more than 20 colleges and universities, including Penn State University, Texas A&M University, Mississippi State University, Iowa State University and North Dakota State University. The group also included an international student from Myerscough College in Lancashire, England.

Jacobsen University hosted several educational sessions, which included a presentation from Abby McNeal, CSFM, Director of Turf Management at Wake Forest University. McNeal gave the group an overview of the Sports Turf Managers Association and shared some advice about ongoing training and player expectations.

"I've always been told not to be afraid to take the ground balls," said McNeal. "Take basic courses to keep your skills sharp like fertilizer calculation or machine calibration. It's amazing how much you forget over the years.

"Joe DiMaggio once said that every game there could be a kid who's seeing him for the first or last time and he owed it to them to give his best," McNeal told the group. "It's the same with our profession: every game you prepare for is the most important of the season, whether its Pop Warner football or an NFL playoff game."

The group also heard from Dr. Jim Brosnan of the University of Tennessee, who gave a presentation on herbicide resistance. Research has shown that herbicide resistance is being perpetuated by turf managers who use the same modes of action, year after year.

"Some of the guys I talk to out there are using the same herbicides in the same way for years," Brosnan told the group. "And they wonder why their grass is resistant to herbicide. The key is rotating your modes of action to avoid resistance."

One of the highlights of the week included a visit to the University of South Carolina (USC), home of the back-to-back College World Series champions in NCAA Division I men's baseball. USC Sports Turf Manager Clark Cox gave students an exclusive look behind-the-scenes at the school's state-of-the-art sports complex. Cox also shared his experiences and challenges of managing turfgrass in the transition zone.

Reflecting on the event, students said their experiences will better prepare them for their job search and future careers.

"This event made me more confident about finding a job and better prepared for the work that lies ahead," said Robert Glenn, graduating senior at Mississippi State University. "Plus, the fact that I have contacts at two upper echelon sports facilities extends my networking reach even further."

It was also encouraging is how positive the recent graduates are about job opportunities.

"I'm not really worried about getting a job," said Derek Christensen, graduating senior at North Dakota State University. "The last 3 years, all the turfgrass graduates from our school found jobs right away. I think this week has put me in a great mindset to begin my job search." ■

Graco launches new FieldLazer S90 field marking machine

Graco Inc.'s FieldLazer S90 is the industry's first battery-powered, high-pressure airless sports field marking machine. It is an affordable, easy-to-use striping solution with proven Graco FieldLazer spray technology that reduces paint costs by up to 75%. The field marker delivers professional, bright, long-lasting lines for up to 10 soccer fields or one football field on a full charge, powered by a 12V battery. The spray technology coats both sides of the grass blade (and not the ground) in a single pass with undiluted paint. Just pour in paint and press the button to start. The removable, Tilt-N-Pour 6-gallon paint hopper minimizes refills and is easy to fill, remove and clean. The FieldLazer S90 marking system is compact and portable with an adjustable handlebar for comfortable spraying at all heights and for easy transport and storage.

Graco FieldLazer

Pioneer Athletics

Pioneer Athletics developed the world's first No-VOC athletic field marking paints for natural grass. Recognized by the United States EPA's "Design for the Environment" program for using environmentally preferable chemistry, Brite Stripe Ultra-Friendly, Game Day Ultra-Friendly, and StarLine Ultra-Friendly provide turf managers, coaches, and parents three options to mark playing surfaces with white and blue paint without compromising environmental concerns. Pioneer's Ultra-Friendly paints are also available in No-VOC red, orange, yellow, and black and are pending EPA DfE recognition.

Pioneer Athletics

Temp-Stripe athletic field marking paint

Removable synthetic turf marking paint that applies like normal field paints. Our exclusive formula was designed and developed for temporary use on synthetic turf fields in which numbers, lines, logos and boundaries require a quick change over following an event. Temp-Stripe is available in all team colors. Removal is accomplished with light to moderate water pressure and scrubbing or with help from our Port-A-Scrub paint removal machine. No costly chemical solutions needed. Because the colors are organic in nature and biodegradable, it is environmentally friendly, low VOC and completely safe on turf, uniforms and players.

It's the original Temporary Athletic Field Paint!

Whitlam Paint

Custom field logos

Give your field a professional look with a custom field logo. World Class field stencils are computer-designed and cut to provide the highest quality field graphics at an economical cost. Because we manufacture both the stencils and field paints, we can supply the entire field graphics package with just one phone call. World Class Field Stencils are perfect for painting letters, team logos and corporate sponsor logos on any turf areas. Last minute? No problem. Most stencils can be delivered within 2 weeks.

World Class Paints

Streamliner Dryline marker

The Streamliner is simply the best dryline marker in the business. With its variable flow control, Field Testing has proven the Streamliner is the best for the quality of the chalk line while using less chalk than its competition. A heavy-duty steel frame, pneumatic tires, rugged molded plastic hopper, flexible brush agitator, accurate string-line guides, and a one-button retractable handle for easy storage set the Streamliner apart. Available in 2-, 3-, and 4-wheel models. Perform two jobs with one machine when striping your fields by adding the optional Beacon Double Play Aerosol Attachment to allow you to stripe fields with chalk or paint quickly and with no mess! The Double Play Aerosol attachment grips to the base of the handle and allows for up and down adjustment to ensure proper line width.

Beacon Athletics

TempLine natural grass turf marking paint

TempLine Natural Grass Paint delivers excellent performance with less environmental damage and waste. TempLine is easy to mix and apply, with superior brightness, opacity, play durability and weather resistance. Each box makes from 5 to 14 gallons of paint. You decide how much paint to make with each box, depending on your line brightness requirements. Besides ease of preparation, application and great marking performance, TempLine formulation and packaging means no Volatile Organic Compounds (VOCs) released into the air, less solid waste to dispose of, less required storage space and lower shipping cost. One pallet of 96 boxes provides from 480 to 1,344 gallons of paint, the equivalent of three pallets of 5-gallon pails.

Eco Chemical

NewRider 1700 HPA

The NewRider 1700 HPA by Newstripe is the economical ride-on high pressure airless striping machine for marking athletic fields. The NewRider 1700 HPA is designed to quickly spray straighter, brighter looking lines and the 25 gallon paint tank will stripe numerous fields without having to be refilled. Additionally, the fully adjustable spray pump on the NewRider 1700 HPA saves money by spraying 'just the turf' and 'not the dirt' with any paint. The on-board purge tank eliminates clogging of spray tips and makes clean-up a snap. The NewRider 1700 HPA also features a hydrostatic drive and a 10.5 hp Briggs and Stratton OHC engine with electric start, and removable gun with 25' hose for stencils.

Newstripe, Inc.

Tru Mark 15 Plus multipurpose sandbag

It is our multipurpose sandbag product line, specifically the 15 Plus Sandbag for canopy ballast and other uses to hold vertical leg structures in place with minimal footprint yet maximum ballast. Features include: 15 Pound Plus durable double sandbag construction for longevity and maintenance free use; no staking with Velcro strap to keep sandbag in vertical position with maximum ballast and minimal footprint; designed for ballast filling by customer with desired material in a separate bag insert—so spillage for indoor use; and 6-inch nylon carrying handle for quick and easy setup and relocation, Velcro closure for securing ballast material.

Tru Mark Athletic Field Marker

Kromer can customize your machine

Use up to 50% less paint and get the job done 30% faster with Kromer. We manufacture a complete line athletic field maintenance equipment allowing you to paint, mark, and groom on natural as well as synthetic fields with ease. Choose the model that's right for you or let us customize one to meet your needs. Kromer's Field Commander tractor along with its hydraulically actuated field grooming and painting attachments will make creating a safe, playable and aesthetically pleasing field a manageable task. Get up to $4,000 off your purchase with Kromer's Saving Bonanza going on now - call or click for more details. You provide the field, we provide the solutions!

Kromer Products

Game Time Stripe-It aerosol paint

Louisville Slugger Game Time Stripe-It aerosol cans have uniform coverage with quick drying results, crisp lines, and are perfect for marking all athletic fields. The paint is water-based, and eco-friendly. It is safe for all turf fields, and can even be used on damp turf. It has a long shelf life. The spray nozzle is uniquely designed to sit out of the way of your finger, resulting in no more paint on your fingertips. The can fits in most competitors' aerosol machines. The paint is available in white or 11 different colors, and colors are also available in 5 gallon buckets. Made in the USA! Game Time Sports Systems also carries the application equipment.

Game Time Sports Systems

New PUMP-N-GO spray liner

A great new alternative to aerosol painting of athletic field lines, the PUMP-N-GO is a lot quicker to use and delivers a more vivid line. This lightweight paint liner has a 2-gallon tank capacity, so there's no need to stop and shake cans repeatedly; just PUMP IT UP and you're ready to paint a few hundred feet. The PUMP-N-GO uses our #4030 EZ paint which is ready-to-use and is offered by the case with four 1-gallon bottles. This economical system is great for schools or parks with a few fields….or can be used for 'touching-up" fields at larger multi-field complexes.

Markers, Inc.

Line Racer

With almost two decades of experience manufacturing electric line marking equipment, Fleet's latest addition to its range is the Line Racer. A compact battery-powered unit that has all the convenience of the aerosol can type machine but delivers big sprayer performance. Line Racer is a striping system that uses Ultimate Line, a sealed, 1-gallon jug of paint that plugs cleanly into the machine and allows you to paint a complete soccer field with the flick of a switch. With a two jug capacity and enough battery power for several fields, you can produce quality lines in half the time without the need to shake cans or deal with the disposal issues of partially used cans.

Fleet US

Jacobsen launches new AR522 contour rotary mower

Jacobsen has launched the new AR522 contour rotary, a mower with superior climbing and ground-following capabilities. The new mower is an update of the previous Jacobsen AR-522 and is designed to maintain intermediate golf roughs; green and tee surrounds; and sports and recreation fields. The new AR522 five-gang rotary mower is equipped with SureTrac four-wheel drive traction and weight transfer control, allowing it to glide over ground contours and climb hills with ease. The SureTrac system automatically transfers power where needed to provide superior performance on hills. The AR522 also features an advanced weight transfer system that allows for balancing of the machine's weight between the traction unit and decks for optimal traction and ground following in varying terrains.

Jacobsen

2013 Gator heavy-duty XUV models

John Deere introduces its 2013 Heavy-Duty Crossover Utility Vehicle (XUV) lineup. Featuring the all-new, fastest, most powerful four-seat Gator available, plus updates to current models. Outdoor enthusiasts sharing the trail or work site can now transport friends, family and gear in the all-new, heavy-duty XUV 825i S4. The latest addition to the Gator family provides the durability and versatility owners expect around their property or off-road destination. To allow for extra passengers or needed cargo space, the XUV 825i S4 provides an innovative, convertible rear seat cargo space. Two additional passengers can be transported in the rear seat area that includes a large under-seat storage compartment. And when more cargo room is needed, the rear seat folds down in just seconds providing a flat platform with tie-down points that can hold an additional 400 pounds of payload.

John Deere

Jack Trice Stadium, Iowa State University

- **Level of Submission:** College
- **Category of Submission:** Football
- **Head Sports Turf Manager:** Tim VanLoo
- **Title:** Athletic Field Manager
- **Education:** Master's Degree in Turfgrass
- **Experience:** Spartan Stadium, 2004-2007 (graduate assistant); Northwestern University, 2007-2010 (athletic field manager); 2010-present at Iowa State as athletic field manager
- **Other crew to recognize:** Josh Lenz, Kevin Hansen, Adam Gregerson, Ethan Dykstra, Joel Rieker, Zach Simons, Josh Meyn, and Colton Metzger.
- **Original construction:** 1996
- **Turfgrass variety:** Many different varieties of Kentucky bluegrass
- **Overseed:** We seed in the spring and throughout the football season in the fall. The field gets a total of 1000 lbs of Kentucky bluegrass seed throughout the year.
- **Drainage:** Traditional herringbone

CHALLENGES

Our biggest asset is also our biggest struggle; let me explain. I am the only full-time employee dedicated toward the athletic fields and athletics grounds. We fill the void in manpower with students. These are all turfgrass students working through the University's Horticulture Department. We rely heavily on them "buying in" and "taking ownership." I would be lying if I told you that they all did, but most do. This is my third season at ISU and every year we have had different personnel. Different personnel each year makes "getting in a routine" impossible, but it does allow for many "teaching moments." Throughout the summer I had five guys working for the athletic department on the fields and common areas. In the fall we bump up to eight students because they are limited to 20hrs/week due to state law. The crew this year has been in-

▼ **FROM LEFT TO RIGHT:** Blake Nelson, Tim VanLoo, Kevin Hansen, Adam Gregersen, Josh Lenz, and Colton Metzger.

strumental in the success that our fields have been having, especially Jack Trice Field.

This year's weather has proved to be the most difficult of my career. We have had one of the worst droughts on record coupled with very high temperatures. Our irrigation has been working overtime since June and has not been able to stop. The disease pressure was low, but dealing with daytime temperatures near 100 degrees for multiple weeks was something I had not experienced. Our cool season turf was stressed from June through August with above average temperatures.

The crew and I did as much as we could to keep the grass cool and moist. Closely monitoring moisture levels with a Spectrum TDR Fieldscout was instrumental in helping us keep a good moisture level without overwatering. We would check moisture levels each afternoon to help us set up the irrigation for the next morning. We also would compare what the ET data that our weather station would calculate. Between those two tools we were able to keep adequate moisture levels without overwatering.

With the above average temperatures root growth was of high concern. We continued to aerify and top-dress throughout the summer. We hollow tined four different times from April through July affecting about 23% of the surface area in total for the year. Since August we have needle tined five times. We were just trying to ensure that the plant could respire as much as it could in the temperatures that it was trying to survive in. I think that staying aggressive with the aerifier proved to be crucial in sustaining root growth throughout the hot summer.

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

VanLoo: I use many channels of communication: text, email, phone, and face to face. The type of communication depends on the situation and coach. I have found that face to face or phone call is the best when situations are uncertain and many scenarios can play out. Emails are the best for me when schedules and specific needs are being asked for in advance. Text can work for this, but I always fear forgetting about it, when it's in my inbox I won't forget.

The few times where emotions can get high, I feel it's very important to speak face to face. You and the coach or staff person are less likely to say something that can be taken the wrong way if it's in person. Reading emotion from people is very important, and face to face discussions are the only way to be accurate.

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

VanLoo: My specific job responsibilities are and not limited to: Jack Trice Stadium, Johnny Majors Practice Field, Two-a-Days Practice Fields, Bergstrom Indoor Facility, Cyclone Sports Complex (Softball, Soccer, and Track), Cross Country Course, and all the landscaping and grass that surrounds our athletic facilities. About 55 acres total, only 15 acres irrigated.

The most enjoyable part of my job is the students. My entire staff is made up of Iowa State turfgrass students. Working with students on the application of classroom principles and helping to prepare them to become future turf managers is the goal. I rely on them to do every part of what it takes to prepare our fields. There is a lot of freedom to manage each other and find tasks that needs to be done. Sure, there are many mistakes made, but learning from mistakes is sometimes the best education. I had the privilege of having many great mentors as I learned the industry; my hope is to return that to the students that I have been given the opportunity to work with.

The least favorite part of the job would probably be paper work and University processes. I know it's a necessity, but that doesn't mean I have to like it!

ST: How did you get started in turf management? What was your first sports turf-related job?

VanLoo: I got started in the turf industry in high school. I started working for a driving range and maintained a practice putting green. After high school I started working for a country club.

My first sports-related turf job was growing in Spartan Stadium field while an undergraduate at Michigan State University. We grew it in modules offsite and moved them in the following year. That first summer I helped water and maintain the seeded Kentucky bluegrass field. That project hooked me into sports turf management.

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

VanLoo: Balancing work and personal life is a constant give and take. I have been blessed with a very supportive wife who understands that certain times of the year demand much of my time at work. Without her support I could not be successful in this career. When times slow down I do my best to make sure my family knows they are my number one priority.

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

VanLoo: Any changes this year will be a reaction to the weather. I am a creature of habit so I don't like to stray very far from what has worked before, but Mother Nature usually forces me to change something. In my three seasons at Iowa State I have been through a record-breaking flood and a record-breaking drought. I am hoping for a statistically "normal year" this year.

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

VanLoo: The sustainable practices that we have adopted focus on water conservation and precise pesticide applications. We use ET and TDR soil moisture sensors to determine irrigation schedules. I like proof in numbers to back my decision to water. For the precise pesticide applications we use a GPS equipped sprayer. The single nozzle control doesn't allow any overlap. This ensures accuracy of application and doesn't allow for over application anywhere. Agriculture has been using this technology for many years, proving its reliability.

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

VanLoo: This is hard to say. I don't imagine its gets any easier! College sports are a growing business with more and more demands on all who are involved. I like change, so I am excited about the future and what it holds for me. ■

STMA in San Antonio: association's offerings taking shape for 2014 Conference

AS REFERENCED IN A RECENT STMA NEWS ONLINE ARTICLE, STMA's 2014 conference will be held in one of the country's most vibrant up-and-coming cultural centers: San Antonio, TX. Home to the historic Alamo and world-renowned River Walk, this unique community offers a wealth of sights and sounds for all to enjoy. The Grand Hyatt Hotel, the conference host hotel, is connected to the Henry B. Gonzalez Convention Center (site of the education and trade show) and STMA has negotiated a special $165 room rate for attendees. More conference details can be found at stma.org, so don't forget to register and keep checking back for more updates!

A stop in San Antonio would not be complete without a visit to the world-famous River Walk, which opened a new 1.3 mile extension since STMA was there in 2007. In 2010, *Travel + Leisure* magazine named it one of "America's Coolest River Walks" saying, "This granddaddy of river walks charms with 4 miles of cypress-lined cobble-and-flagstone paths along both sides of the narrow San Antonio River. Locals and visitors cool off on the horseshoe-shaped loop downtown, meandering past trendy shops and stopping at hot spots like Boudro's for guacamole prepared tableside." A number of varied shopping and cultural events abound; the downtown area surrounds the convention center and the Alamo is directly adjacent.

And, with STMA's Call for Presentations behind us—and having reached a record number of submissions in the process—the content for 2014's conference in San Antonio is rapidly coming into focus. As with the 2013 conference in Daytona Beach, 11 distinct educational tracks will be highlighted with a good number of sessions supporting each. These tracks include **turfgrass management, pest control, water/drainage/irrigation, design/construction/renovation, synthetic fields, facility management, baseball/softball, professional development, environmental issues/sustainability, research, technology, and international sports/facility management**.

To give you a hint of the topics to be featured in San Antonio, we're highlighting just a few of the sessions to illustrate the depth and breadth of what's in store for attendees during STMA's 25th Annual Conference & Exhibition!

"Evaluation and Preparation of Fields for Heavy Use"

Presenters: Dr. Grady Miller

Description: Working with schools and Park & Recreation units, I continually see overused fields. The questions are almost always, 1) what are the most important practices? 2) What can I do when they start to wear? 3) How much use can my field take? I've developed a presentation and handout material to help them answer these issues.

Objectives:

1. After seeing examples, attendees should have a better understanding of problems they may face with high use fields.

2. Attendees should have a better understanding of how to access their field conditions.

3. Attendees will be given informational tools they can use to find answers in field management.

Title: "What Are Your Weeds Telling You?"

Presenter(s): Jim Brosnan, PhD & Gerald Henry, PhD

Description:

Weeds are often indicative of other agronomic problems within warm- and cool-season athletic fields including issues pertaining to soil compaction and nutrient management that can reduce field safety and playability. This presentation will not only teach attendees the importance of indicator weeds (i.e., weeds that indicate an agronomic issue) within a field, but also emphasize the integration of cultural and chemical practices for weed management programs on athletic fields. Attendees will learn why implementing these weed management programs is a critical step towards maximizing athletic field safety and playability. Programs presented will be based on research findings surrounding the use of cultural practices such as aerification and fertilization as well as the use of both old and new herbicide technologies available to athletic field managers. Particular emphasis will be placed on annual bluegrass control given its importance to both warm- and cool-season athletic field managers at all levels of play.

Objectives:

After attending this presentation, attendees will:

1. Be able to identify indicator weeds of warm- and cool-season athletic fields

2. Understand agronomic problems associated with the presence of indicator weeds in their turf

3. Learn how to build integrated weed management programs using both cultural and chemical practices

4. Understand the importance of controlling weeds with these programs for the purpose of maximizing athletic field safety and playability

5. Be aware of new technologies for managing weeds of warm- and cool-season turf athletic fields; particularly annual bluegrass

On Wednesday during the conference, STMA will be featuring a full day track dedicated to pest control so people can receive their pesticide recertification credits. One of the featured sessions in the pest track:

Title: Advanced Turf Disease Management: Maximizing Pesticide Applications to Improve Product Performance

Presenter(s): Mike Fidanza, PhD

Description:

I would be willing to deliver this presentation as a follow-up to my Post-Conference 'turf disease' seminar from the 2013 STMA Conference. This could be an 'Advanced Turf Disease' post-conference seminar. In this presentation, I would focus on product application delivery (i.e., spray nozzle selection, water volume, many other factors) to improve fungicide and other plant protection/plant health product applications to sports turf.

Objectives:

After attending this session, participants will be able to:

1. Properly select nozzle type and size for improving pesticide applications to sports turf

2. Select the best water-carrier volume to maximize pesticide performance

3. Understand the importance of fungicide selection and mode of activity to improve/maximize pesticide performance.

On Thursday during the conference, there will be three courses dedicated to student advancement in the industry. There are also two "STMA" courses with one dedicated to the CSFM exam and one dedicated to FOY winners.

Friday morning will feature a number of workshops, one of which is detailed below:

Title: "Turfgrass Mathematics 101: The calculations every turf manager should know"

Presenter: Barry Stewart, PhD

Description:

Many athletic field managers are unsure of their math skills. This workshop will cover common calculations that athletic field managers need to know how to do in the course of their jobs. Determination of area, applicator calibration, and product per area calculations will be highlighted. There are several apps for smart phones for these calculations and with the widespread availability of broadband internet and WiFi connectivity these are now even useful in the field, but without a knowledge base of what numbers to expect these apps can be problematic if they are relied on too heavily.

Objectives:

1. After attending this session the participant will be able to determine how much product to apply to a given area.

2. After attending this session the participant will be able to calibrate wet and dry applicators.

3. After attending this session the participants will become familiar with Smartphone apps that help solve these problems but have a working knowledge of the mathematics behind the Apps to know if the App is giving you garbage.

Also on Friday, there will be four innovative sessions featured on the trade show floor that will focus on emerging technology in the industry. ■

Membership Application

SportsTurf MANAGERS ASSOCIATION

Experts on the Field, Partners in the Game.

Fax to: (785) 843-2977

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

Name _____ Title _____

Employer/ Facility _____

❑ Business ❑ Home

Address _____

City _____ State _____ Zip _____

Home phone _____ Work phone _____ Cell phone _____

Fax _____ Email _____

Signature _____

Direct Supervisor Name _____

Membership Category:

❑ Sports Turf Manager $110

❑ Sports Turf Manager Associate* (Additional member(s) from the same facility) $75

Please select the primary facility type where you are employed:

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

❑ Academic $95

❑ Student (verification of enrollment) $25

❑ Commercial $295

❑ Commercial Associate* (Additional member(s) from the same commercial company) $75

❑ Affiliate (Person who is indirectly or on a part-time basis, involved in the maintenance/management of sports fields) $50

❑ Chapter Dues (contact headquarters for amount)
Chapter name) _____ $_____

❑ Contribution To SAFE Foundation (research, education and scholarship): $_____

Total Amount Enclosed: $_____

"I know I am a better sports turf manager because of this association. As sports turf managers, we take the challenge seriously to make our fields the best possible for the next game. The resources I have access to through STMA helps me do it."

— Bob Campbell, CSFM
Higher Education
Membership Segment

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 manager 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**

STMA.org provides many resources

THE STMA WEBSITE, www.STMA.org, has numerous educational resources available to members and non-members.

Public

Access to various educational resources is available to anyone under the Knowledge Center tab on the STMA website. Even if you are not an STMA member, you can access valuable information that will assist in the safety and playability of your athletic surfaces. Topics available in the Knowledge Center include:

• Conference Education – access the educational materials presented at our Annual Conference and Exhibition for the past 3 years. Materials include PowerPoint presentations, notes, handouts, and relevant articles.

• Turfgrasses – resources that help you manage both cool and warm season turfgrasses successfully

• Construction/Renovation – provides tips on how to construct, reconstruct, renovate, and maintain your sports fields and facilities

• Health & Safety – resources that promote safe practices in the workplace ranging from back injury prevention, to chemical safety, to motor vehicle safety.

• Recordkeeping – everything you need to maintain detailed records for your shop, grounds, equipment, and staff. This includes field maintenance resources, equipment records, budget resources, and employee records.

• Environmental Stewardship – resources that address environmental stewardship for athletic facilities and athletic fields. This includes Integrate Pest Management (IPM) and organic management practices. Water conservation resources are also provided.

• Cultural Practices – access information on fertilization, irrigation, and drainage.

• Sports Field Dimensions – receive step by step instructions on how to accurately measure and paint all of your athletic fields

• Multimedia – here you can access education sessions that were recorded at the 2010, 2011, 2012, and 2013 annual conferences. In addition, STMA- and University- produced podcasts and webinars cover various turfgrass management topics including fertilization, heat stress, cold temperature injury, and more.

• Turfgrass Insects, Weeds, and Diseases – contains information for identifying and controlling turfgrass pests

• Synthetic Fields – resources include research articles and publications that cover benefits, drawbacks, and management of synthetic turf fields

• Guias en Espanol – a page dedicated to Spanish speaking sports turf managers, which allows access to field management bulletins translated to Spanish.

• University Turf Sites & Turfgrass Faculty and University Publications - links to information, research, and people from higher education institutions across the country.

Members Only

Much of the information on the Members Only side mirrors the public side. However, STMA members are allowed access to in-depth research and technical bulletins. Resources can be accessed by logging in as an STMA member and accessing any of the categories under the Knowledge Center.

• Construction/Renovation – in addition to what is available to the public, information on constructing field slope and proper rootzone, as well as selecting the correct turfgrass is available.

• Cultural Practices – information on fertilization includes an analysis of plant responses to nutrient applications and bulletins that address soil tests, nitrogen sources, and fertilizer calibration. Information on irrigation provides sports turf managers further explanation about rootzones, water tables, and irrigation systems. Information on drainage includes drainage systems and dealing with flooding events.

• Environmental Stewardship – resources include various ways to implement environmental initiatives at your facility including recycling, water efficiency, stormwater management, transportation, lighting, and more. Initiatives for athletic fields include turfgrass species selection, cultural practices, and integrated pest management. Water conservation resources are also available including STMA bulletins on "Field Management During a Drought" and "Effective Water Use".

• Health and Safety – Athlete safety is a priority for sports turf managers. Therefore, STMA provides resources to help members understand how to maintain safe playing surfaces. Bulletins such as "Thatch Management" and "Strategies for Managing Heavily-Used Fields"

Construction & Renovation Bulletins

Check out the following technical bulletins available to members only to assist with construction and renovation processes:

- 8 Steps to an Easy Field Facelift
- Football Practice Techniques that Help Minimize Field Wear
- Strategies for Managing Heavily-Used Fields
- Thatch Management
- Sprigging Bermudagrass
- Understanding Soil Tests
- Flooding on Sports Fields
- Snow Removal
- Football/Soccer Safety and Maintenance Checklist
- Baseball/Softball Safety and Maintenance Checklist
- The STMA Collection of ASTM Standards for Athletic Fields
- A Guide to Synthetic and Natural Turfgrass for Sports Fields - Selection, Construction and Maintenance Considerations
- Advisory Bulletin 1: Determining the Right Sports Field for Your Athletes
- Advisory Bulletin 2: Suggested Equipment List
- Advisory Bulletin 3: In-House; Architect-Bid-Contractor; Design-Build; Owner's Representative... What works best for building your sports field?
- Advisory Bulletin 4: The Fundamentals of Project Management
- Advisory Bulletin 5: 'Lessons Learned': Peer Advice on the Management of Synthetic Sports Fields
- Natural Grass Athletic Fields for High Schools
- Natural Grass Athletic Fields for High Schools PowerPoint
- Defending Your "Turf" - Play Offense

are available in addition to field safety and maintenance checklists.

• Multimedia – members can access the Mound Building and Home Plate Maintenance and Infield Maintenance Instructional videos.

• Professional Development - If you are looking for a job, resources that help you write a cover letter and resume and ace an interview are available. If already employed, bulletins on communication, leadership, and workplace issues are also available.

• Synthetic Fields – In addition to what is available on the public side, members can access additional advisory bulletins that give recommendations for equipment, project management, and more.

• Turfgrasses – more in-depth information is available for sports turf managers to determine which type of turfgrass will best meet the needs of athletes and perform the best on the field.

• STMA Educational Bulletins – STMA members can access bulletins that cover a wide range of turfgrass management topics including seasonal field maintenance calendars for cool season, warm season, and transition zone regions, field management, environmental stewardship, safety, synthetic fields, professional development, construction and renovation, and business practices. ■

SAFE Foundation expands Board

THE FOUNDATION FOR SAFER ATHLETIC FIELDS FOR EVERYONE (SAFE), STMA's Charity, has expanded its Board to 12 people. In 2012, SAFE had nine board members. "The expanded board adds new depth of experience to better help us pursue our key goals this year," said Chairman of the Board of Trustees Cathy Bradley. "Our focus in 2013 is to increase community outreach efforts as well as to continue to pursue our fundraising goals."

Past fundraising efforts include the events held in conjunction with the STMA conference, such as the auctions, raffles, casino night and a golf tournament. For the first time, SAFE is developing an interactive community educational component. "Providing maintenance staff, coaches, volunteers and parent groups with education on how to care for their field is a very important component of ensuring player safety," said Bradley. The educational outreach is planned for the San Antonio area around the STMA national conference in January.

In addition to Chairman Bradley, who is also the Executive Director of the Baseball Tomorrow Fund, SAFE Officers include:

Vice-Chair Allen Johnson, CSFM, Fields Manager, Green Bay Packers

Secretary Steve Wightman, Retired Sports Turf Manager

Treasurer Doug Schattinger, President, Pioneer Manufacturing

Trustees

Jon Butler, Executive Director, Pop Warner Little Scholars

Ken Curry, Vice President, Covermaster, Inc.

David B. Houseknecht, Sr. VP of Administration/CFO, Little League International

Debra Kneeshaw, Lead Park Technician, City of Portland Parks & Recreation

Gil Landry, Jr., Ph.D., Professor/Turfgrass Management, University of Georgia-Griffin Campus

Chad Price, CSFM, CFB, President, Carolina Green Corp.

Paula Sliefert, Sr. Marketing Manager, The Toro Company

Jay Warnick, CSFM, Athletic Fields Manager, University of Portland

The SAFE Executive Director is also the CEO of STMA, Kim Heck. ■

STMA Affiliated Chapters Contact Information

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

Colorado Sports Turf Managers Association: www.cstma.org

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

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

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

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

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

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

Illinois Chapter STMA: www.ILSTMA.org.

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

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

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

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

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

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

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

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

Nebraska Sports Turf Managers Association: sphillips4@unlnotes.unl.edu

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

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

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

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

Northern California STMA: www.norcalstma.org.

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

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

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

Ozarks STMA: www.ozarksstma.org.

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

Southern California Chapter: www.socalstma.com.

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

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

Texas Sports Turf Managers Association: www.txstma.org

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

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

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P ❑ Park
H ❑ Other (please specify)_____

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

A ❑ EXECUTIVE/ADMINISTRATOR — President, Owner, Partner, Director, General Manager, Chairman of the Board, Purchasing Agent, Athletic Director

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C ❑ GOVERNMENT OFFICIAL — Government Commissioner, Agent, Other Government Official

D ❑ SPECIALIST — Architect, Designer, Consultant, Agronomist, Horticulturist, Certified Specialist

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Q&A

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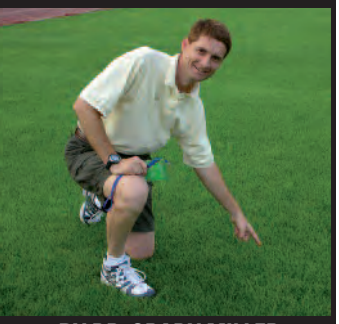

BY DR. GRADY MILLER
Professor, North Carolina State University

Questions?
Send them to Grady Miller at North Carolina State University, Box 7620, Raleigh, NC 27695-7620, or email grady_miller@ncsu.edu

Or, send your question to David Minner at Iowa State University, 106 Horticulture Hall, Ames, IA 50011 or email dminner@iastate.edu.

I am a parent of a student-athlete and volunteer with our local high school in preparing their baseball field. I have an agriculture background but it does not include turfgrass except for what I have picked up the past few years while working on the field. The school has decided that it is finally time for a major renovation to address the field's significant drainage problem and the poor infield grass. Do you do this type of work and can you give us an estimate of what it would cost?
North Carolina

It is not unusual to get these types of questions from schools several times a year. The questions almost always have the same elements—concerned volunteer, functional problems with a field, and financial constraints. The problems with the field have often been tolerated for years and a tipping point has finally been reached. That point is often reached after the "volunteer" has heavily lobbied the school administration for a change and they are given a go-ahead to investigate. Then I get an e-mail or phone call, hoping the University can jump-start the process.

From the broad "need help" perspective, these are generally long-term matters that are not easily addressed with a simple response. My experience from an extension specialist perspective has been that political, emotional, and financial influences combine to make these matters complex. Often the school is not fully prepared for how much it may cost to properly renovate their field, so the project may never pass the fact-finding stage. Then all the dynamics of the people involve with planning and approving, plus back-door politics that can doom a project.

My initial role is to bring a group together that can get their arms around the entire project, not just one facet. I usually provide a list of Certified Field Builders that work in their area. In North Carolina we have some great ones, so this is an easy step for me. I am happy to work with a school in their discussions with a builder if they want an unbiased intermediary to help them with terminology or processes. With adequate funding up front and good weather during renovation, these projects often end with happy customers.

I will assist as much as possible to educate people to try and minimize the influence of politics, while staying out of the price aspects. My contribution often includes agronomic information for items such as grassing specifications, grow-in programs, maintenance calendars, etc., that can be useful in pre-bid or post-construction.

Recently, I visited a high school football field at the request of a volunteer. I met with a volunteer, several coaches, the athletic director, and a county operations representative. I could feel the tension among them in the pre-inspection meeting. After a field assessment, I left and promised I would get back with them within a couple of days. The field was in horrible shape.

That afternoon I called a field builder and was bouncing a few scenarios past him without mentioning any school names. He immediately called out the name of the school field I had visited. He said that he had been to that field four or five times over the past several years and they could never seem to get all the needed pieces together to get the field re-built. His visits spanned several coaches and athletic administrators, but with the same county representative. Guess who was not on board! And to some extent that can be understandable. The worse shape the field is in, the more work it needs, may translate to greater cost. Someone has to pay for the work and no group seems to have much extra money in their budget.

The previous example is a good reminder why enthusiastic volunteers and eager coaches are not always enough to push through a successful field renovation. School boards and county officials also have to see the need for renovation before they are prepared to see them done correctly. I emphasize "correctly" because nothing is worse than visiting a 1- to 3-year old field that was constructed so poorly that it needs to be bulldozed and started new.

This was the case in one of the fields I visited last year. I was asked to come out to this new school and inspect their baseball field, especially the clay base paths and warning track. The coach told me that his players picked up so much infield clay on their cleats running bases that they were 6 inches taller by the time they reach 2nd base. A local individual had sold them a clay-based soil he said was suitable for a ballfield skinned area. The school had not budgeted for the needed clay replacement.

So the answer to the question is not so simple. I do that type of work, but I do not do it the way they probably imagined. I think my extension colleagues across the US would respond similarly. We want all parties to envision and accept the entire process and what it means to the school and the participants that use the field. Then we want to help them find the best people to accomplish the renovation. I do not price out projects. But I have found field builders to be generous people that are willing to work with varying budgets. In the end, we all just want better fields. ■

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