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David Pinsonneault, CSFM, CPRP, the new President of the Sports Turf Managers Association, has been described as a leader who was able to bridge a gap no one before him had; a professional who prefers to share the secrets of his own success rather than protect them in the name of self-preservation; and someone who went far beyond the standard expectations of a job to produce results that benefitted his colleagues and the profession as a whole.

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From the Sidelines

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

Texas A&M sells Kyle Field turf during renovation

hen the Texas A&M Aggies moved from the Big 12 to the Southeastern Conference in 2012 the powers that be decided it was time to enlarge venerable Kyle Field to accommodate more than 102,000 12th men on football Saturdays. The renovation plans included dropping the playing surface 8 feet and pushing it south 16 feet to add more seats.

The two-phase, 3-year project wasn't about to force the Aggies to move their home games though, not with Heisman Trophy winner Johnny "Football" Manziel running the show at quarterback.

So within hours of the end of last season's final home game, the 57,000 square feet of bermudagrass turf was pulled out in a hurry; the contractors were waiting to get their cranes and other heavy machinery inside the walls of Kyle Field to get to work.

Back in the spring of 2013, Leo Goertz, A&M's athletic fields maintenance manager, and his colleagues had thought that Aggie fans might be interested in owning a piece of history, namely some sod from Kyle Field that they could re-plant in their yard or otherwise keep growing. After receiving the go-ahead from those same powers that be, Leo and his guys figured out how much sod they would have to sell to pay for its removal and associated costs. They knew there wasn't a guarantee that the field would be in terrific condition so they ended up deciding they could get 125 pallets of viable sod from the field.

Goertz & Company decided on 110 pallets at \$400 each plus 1,000 blocks at \$20 apiece, all the while wondering how much demand there really might be. Three weeks before the last home game the announcement of Kyle Field turf for sale was made on a Sunday night; Goertz said the word went viral via Facebook and Twitter. The next morning the sale began online at 8 am, and half the pallets were sold by noon, the rest by the end of the week.

Being a fan of "Pawn Stars," Goertz figured fans might need to prove the authenticity of their piece of Aggie history, so he signed 1,500 certificates to provide such proof. "Everyone around here was accusing me of 'selling grass' and competing with drug lords," he laughed.

The sod removal began at 8:30 pm after the final home contest and was completely stripped out by 9:30 am the next morning. Goertz said it was taken to a parking lot for a day and buyers were instructed to pick up their pallet(s) by noon the next day. "There was a long line that morning; we had to have the police here to keep it organized," Goertz said. "People showed up in 18wheelers, pickup trucks and even one Escalade. We had two lines with forklifts to load everyone up with the 2,000-pound pallets.

"One guy in an 18-wheeler from Houston bought five pallets, and asked if we had any more. After everyone had picked up, we had some left over so he had the truck turn around and bought 10 more. He said he would have bought the whole field if given the chance," Goertz said. "He sent me a photo later showing how he had layed out his sod around his house.

"We also produced a grow sheet to help the buyers keep the bermudagrass growing," he says. "It includes the web address of the turf department here. We had been hammered by emails asking where to plant the grass, etc., and we wanted to provide the right information, like letting buyers know that the bermuda will go brown in winter but green back up in spring."

See photos on page 47.

Jungehusten

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President's Message

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



Make a difference in the New Year

s the calendar turned into 2014 many of us have already dealt with heavy snow and single digit temperatures. In fact, 49 out of the 50 states have recorded some amount of snowfall. These weather patterns will definitely have an effect on our athletic fields as we prepare for the spring season. In Lexington, MA our challenge is not only to have the athletic fields ready in early spring, but also the Battle Green where Patriot's Day is celebrated.

Some of us have already begun the spring season and are making a difference by providing safe, playable fields for college softball and baseball. These sports turf managers are using new techniques or tried and true practices to ensure the games go on and the athletes can enjoy and compete without worry. Some of these sports turf managers learned their new ideas or confirmed their current maintenance practices by attending the 2014 STMA Conference in San Antonio. They took advantage of the opportunity to learn from and share ideas with the great selection of speakers, great topics, great networking opportunities and a chance to visit with many commercial members. There were a large number of attendees with a full trade show floor and the site was outstanding. Attending the STMA Conference is a great way to begin the New Year and a great way to recharge and prepare for the upcoming season.

Many of us will face challenges in 2014 by dealing with reduced budgets, reduced staff, new regulations and additional use. That said, this is a resilient group of professionals. We will find a way to do things differently to still provide safe, playable fields. We will find a way to continue to be the recognized leader in the sports turf industry.

Take advantage of the opportunity to form partnerships and promote what you do, implement new maintenance practices and share equipment and knowledge. Challenge yourself this year to do one thing that will help you to make a difference for your athletic fields and for your user groups. Whether school, park and rec or pro, we can all improve upon what we do so that we enhance the experiences of those who use our facilities. Add a maintenance practice that promotes better grass growth, use a new chalk machine to put down a cleaner crisper line, rake a field that you have not been able to before or begin an overseeding program to keep up your turf density. One of the best things about this profession is that a school district sports turf manager and a pro stadium sports turf manager can talk the same language and learn from each other.

Another way to make a difference is to become involved in STMA. This is your association. You can share your ideas or take in someone else's idea. We are in the process of putting together committees for 2014. These dedicated volunteers will be working on ways to help you do your job. Your 2014 Board of Directors is also committed to making a difference for members. I would like to thank outgoing Board members Rene Asprion, Troy Smith, CSFM and Debbie Kneeshaw for their dedication in strengthening the profession. I would also like to welcome the new Board members Brad Jakubowski, Sarah Martin, CSFM and Doug Schattinger who together with the remaining Board and incredible staff will keep focused on the Strategic Plan and work diligently to enhance your member experience. This association sets itself apart from others by keeping a positive outlook and moving in a forward direction.

Continued on page 45



MADE IN MASSACHUSETTS

A modest and dedicated public servant, incoming STMA president David Pinsonneault, CSFM, CPRP, is the kind of leader the industry needs

▲ **STMA** president David Pinsonneault, CSFM, CPRP

f you were to ask those who know David

Pinsonneault, 2014 president of the Sports Turf Managers Association, about his character and leadership style, you'd hear a lot of the same descriptions and strikingly similar stories.

You'd hear examples of his modesty, generosity, diplomacy, honesty and unselfishness.

Stories would pour in that reveal Pinsonneault as a leader who was able to bridge a gap no one before him had.

A professional who prefers to share the secrets of his own success rather than protect them in the name of self-preservation.

Someone who went far beyond the standard expectations of a job to produce results that benefitted his colleagues and the profession as a whole.

But to hear Pinsonneault deliver those same accounts, his modesty would stun you. He was just in the right place at the right time, he says. His life, a series of events where preparation met opportunity.

CARVING HIS OWN PATH

Pinsonneault always knew he wanted to work outdoors, so forestry seemed like a natural choice. A New England native (and near-lifelong resident of Massachusetts), Pinsonneault selected a college with a good forestry program that wasn't too far away from home but also wasn't too close—the University of New Hampshire in Durham.

When he graduated in 1984 with a degree in forest management, job prospects unfortunately weren't so bright. He cobbled together the humble beginnings of his career with a couple of part-time, temporary jobs at a paper company in Maine and doing research for the US Forest Service.

Then a more permanent opportunity appeared when Pinsonneault and his brother started up their own lawn care business.

In the meantime, Pinsonneault had gotten married and had his first child, and after about 4 years in the lawn care business, he started looking for a job with a tad more benefits and a tad fewer hours.

In what Pinsonneault would surely call a "lucky" break, he landed a gig in 1990 working for the parks and recreation department of the community of Mansfield, MA about a half hour away from where he grew up in North Attleboro.

In this position, he quickly moved from laborer to skilled laborer to the head of the maintenance division. Someone was clearly taking note of Pinsonneault's potential. That someone was Lorilee Fish, Mansfield's parks and recreation director, who sent him to the NRPA/NC State Park Maintenance and Management School to expand on his education.

Luckily for the STMA, that program (in addition to providing education on park and turf maintenance) gave Pinsonneault his first exposure to the association through other attendees who were involved.

Education also led Pinsonneault to his next job opportunity. At a turf seminar in Providence, RI, he met Bob Ames, the parks and recreation director in South Kingston, RI. They made a good connection that paid off a couple of months later.

Ames had created a new position of parks superintendent in South Kingston and encouraged Pinsonneault to apply. After a 5-month-long process of various interviews and applications, he got the job.

Leaving a job is never easy, but Fish made it less difficult than most, said Pinsonneault.

"My boss was a big believer in education, and she was very supportive in me advancing my career, even if that meant leaving," he says.

Before he left the job in Mansfield, Pinsonneault received one of those tokens of appreciation that are small and facile yet entirely unforgettable.

Part of his job was setting up the field and lighting for night practice for the high school varsity football team. "After their practice, they called me out onto the field and presented

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me with one of their practice jerseys," he says. "That I think told me that this is the profession I want to be in."

In South Kingston, Pinsonneault had plenty of room to grow, literally and figuratively.

"Because it was a newly created position, I had an opportunity to build the department pretty much from scratch," he says. "We went from one full-time person, a couple of guys from the highway department and some seasonals to six full-time people who were able to take the department in a very positive direction."

In 2000, Pinsonneault became public grounds superintendent for the town of Lexington, MA. In this role, he manages operations of the park, forestry, streetlight and cemetery divisions in the public works department, including approximately 600 acres of land, 75 acres of athletic fields, four cemeteries, more than 3,000 streetlights and around 10,000 street trees. He also oversees 22 full-time employees.

It's a bit of a different set-up in that recreation develops the programs, staffs the programs and handles permitting, but maintenance is under the public works umbrella.

The system requires more attention to coordinate with the parks and recreation department, but Pinsonneault quickly saw the benefits.

"If I need a backhoe or to borrow two guys from another division, it's a lot easier to do," he says. "I have a lot of resources at my disposal."

FOR THE BENEFIT OF ALL

Though Pinsonneault is arguably at the top of his game professionally, he still holds a special place in his heart for his first municipal job in Mansfield, MA. It's where he first learned the ins and outs of the sports turf industry, in many cases with the aid of some helpful colleagues who would go on to become lifelong friends.

One of those helping hands came from Bob Romano, a sales rep at the Scotts Co. at the time. "I didn't know the first thing about taking soil tests, and he was very helpful in setting up a fertilizer program," Pinsonneault says.

Another colleague he credits with helping him learn the ropes at the start of his career is Eric O'Brien, a playground representative in Medway, MA. "He helped me with the overall picture, getting me to step back and see that there was more than just the turfgrass that came into play for an athletic event," he says.

Then there's Mary Owen, turfgrass extension specialist at the University of Massachusetts, Amherst, who worked with Pinsonneault to take an integrated pest management guide for golf courses and adapt it for athletic fields.

"(The golf course industry) had protocols they followed, and we needed the same thing for sports turf," Pinsonneault says.

"David identified the need (for the guide), and the New England Regional Turf Foundation board agreed," Owen says. "We put together a very insightful and dedicated team of eight sports turf managers, and David was a key player in that. This is way above and beyond what these gentlemen normally did in their work day."

Amazingly enough, that wasn't the most notable project Owen and Pinsonneault worked on together. They also played key roles in founding the New England Sports Turf Managers Association. Pinsonneault first got involved while in Mansfield and was elected to the group's board while in Rhode Island. That's where, as Owen attests, Pinsonneault bridged a disconnect between the New England chapter and the national organization.

"The New England STMA started separately from national and was very separate for a long time," she says. "It had conversations with national a few times about becoming a chapter, and we just couldn't quite come to an agreement for a number of reasons. We had tried hard for several years to work one out. It was a real conundrum.

"David picked up the ball and had very respectful, productive conversations that resulted in STMA really looking at how it crafts relationships with its chapters. It was David that finally made that connection happen between chapter and national."

That instance reflects Pinsonneault's abilities as a diplomatic leader, she says. "David doesn't get flustered. He's willing to work through problems to get to a good solution. And in that, he benefitted everybody—New England sports turf, national sports turf. He wasn't hesitant at all about taking on the challenge."

Shortly thereafter, STMA adopted that agreement for the way all chapters were affiliated.

His work to affiliate the New England chapter benefitted the industry in another way by spurring his motivation to become involved at the national level. But it was an anomaly that led Pinsonneault to his first position on the national board.

In 2006, after a rare vacant position on the board opened up, it was up the STMA president at the time, Mike Andresen, CSFM, to appoint someone to fill the position. Andresen's decision was easy.

Having attended a few New England chapter events, Andresen had seen first-hand Pinsonneault's listening skills and problem-solving abilities, as well as the respect members had for him.

"David was so tuned in with his analysis, it was very easy to see that the STMA board and membership would benefit from his personality and skill set," Andresen says. "As I asked colleagues for their feelings on appointing David, it was obvious the decision to appoint him was a no-brainer."

A NON-TRADITIONAL PATH

Pinsonneault's unorthodox journey came to a peak last month in San Antonio, where he was officially elected President of the STMA.

What are his plans for 2014? One of them involves elevating awareness and recognition of the profession.

"There's misconceptions and lack of knowledge about what we do," he says. "We want to get the word out to the public that there's a profession that takes care of their fields and keeps them safe, playable, green and ready to go."

In today's economy, Pinsonneault says the sports turf management industry is in remarkably good shape and he's positive about the future.

"Similar professional associations have had challenges where they've had to cut their staff and cut programs to members," he says. "We don't want to do that. We're trying to add programs."

The annual conference is one area demonstrating particular strength in the industry and organization.

"The quality of education and the trade show has grown significantly," Pinsonneault says. "Daytona was a good example of that. The people who put the program together have done an outstanding job with educational selections and networking opportunities."

Pinsonneault also plans to follow a strategic plan he helped develop for the association, which calls for focus on education, environmental programs, membership growth and conference expansion.

No one possesses more confidence in Pinsonneault's upcoming year as leader than the man who originally appointed him to the board.

"David has no ego, no hidden agenda and he will work his tail off to ensure the board is highly productive and responsible to the membership," Andresen says. "With David, we're going to get a very unselfish leader, and one that I want representing us as president, knowing he brings an understanding and work ethic to the office as strong as any that have served."

STMA CEO Kim Heck agrees. "When David speaks, his comments always have the best interests of STMA at heart. As a leader, David's honesty and integrity are front and center in everything he does," she says. "He has respect for everyone, and as a result is given respect in return. David has a unique ability to bring clarity to issues. He can look at an issue and give a 360-degree assessment of it that really helps discussions in our board meetings."

PASSION IN WORK AND PLAY

As for Pinsonneault, he'll tell you he couldn't have accomplished any of this if it weren't for his family.

He and his wife, Robin, a kindergarten teacher, raised their two children to follow in their footsteps of careers in public service. Their daughter, Noelle, 24, is a special education teacher; and son, David, 21, is studying public service and political science at Providence (RI) College.

Working for the public takes a particular passion, Pinsonneault says, and if you've got it, you're in for a rewarding career. "You've got to like what you do, but you've also got to like making a difference. It's certainly true in teaching, and it's certainly true in the sports turf world."

The rewards? Like Pinsonneault's practice jersey from a high school football team on a late night, they come unexpectedly and they're 100% worth all the work.

"The thing I like about parks and rec, you can see your results," Pinsonneault says. "You maintain the field well, you happen to see the 10year-olds out there playing a ball game, or swimming at the pool, and you know that you helped to make that happen. That's part of the job, too. That's part of the appeal."

Darcy DeVictor Boyle is a free lance writer based in Lawrence, KS.



DRONES OFFER UNIQUE PERSPECTIVE TO TURFGRASS MANAGERS

ew technology can bring a unique perspective to turf management. Unmanned aerial vehicles, or "drones," can provide valuable information to aid sports turf managers. As part of a management program, drones can save time, labor, and money.

Drones are semi-autonomous aircraft that come in a variety of shapes and sizes (see photo). Drones are capable of fully automated flight via GPS-based navigation or manual flight via radio-controlled transmission. They are available as multi-rotor helicopters and fixed-wing aircraft. Companies including Quadcopter, LLC, Lehmann Aviation, Pixobot, LLC, MicroPilot, Inc., and senseFly, Ltd. manufacture and sell drones for public use or provide drone-related services. They can be relatively small, about the size of a large pizza, to several feet in diameter or length. Drones require little technical training and do not require a pilot license for operation. They can operate in a wide range of environmental conditions. Drones can fly in hot or cold temperatures, humid or dry air, and sunny or cloudy skies. Although Federal Aviation Administration regulations currently prohibit drone flights for commercial operations, rule changes could come as early as 2015. Recently, farmers were granted permission to operate drones over their own property for personal use, in accordance with guidelines established by the Academy of Model Aeronautics.

WHAT DRONES DO

In a turf management program, drones are best used as a platform for collecting aerial imagery. Digital cameras collect visible light reflected from surfaces. Visible light is the portion of the electromagnetic spectrum "visible" to the human eye; it ranges from 400-700 nanometers (nm) in wavelength. Digital cameras record visible light information into three channels—red, blue, and green (RGB)—that make up each pixel in an image. Imagery can provide real-time information on many aspects of turf quality important to turf managers.

Images can be analyzed with computer software and used to quantify turf status through a process called digital image analysis (DIA). The DIA method is recognized for its ability



made unmanned aerial vehicle, or "drone," is shown flying over turf. Drones are used as a platform for digital image analysis, enabling quick and efficient quantification of turf quality and stress. Image by Keenan L. Amundsen.

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to objectively quantify many turf quality parameters, including percent green cover, turf color (via a dark green color index, or DGCI), fertility, chlorophyll index (i.e., "greenness"), and others. The objective nature eliminates variability associated with subjective visual ratings.

In addition to their impact on visible light reflectance, many turf stresses largely impact reflectance in the near-infrared (NIR) region of the electromagnetic spectrum. Near-infrared is the portion of radiation just beyond that visible to the human eye, ranging from 700-1300 nm in wavelength. The NIR provides the ability to "see" stressed areas otherwise invisible. Near-infrared radiation can be detected and recorded using a modified digital camera. Modification costs are relatively inexpensive, costing about the same price of a new mid-grade digital camera; pre-modified digital cameras are also commercially available.

Research at the University of Nebraska-Lincoln John Seaton Anderson (JSA) Research Facility near Mead, NE, in 2010-12 has shown RGB and NIR information in digital images can be extracted with computer software and used to quantify turf quality and stress. Two commonly used agronomic measurements include chlorophyll index (CI) and the normalized difference vegetation index (NDVI). Although computed somewhat differently, each is an objective measurement of turf "greenness," calculated by mathematical manipulations of red and NIR reflectance data. Other methods based on analogous principles involve handheld sensors. Handheld sensors are commercially available that measure visible and NIR reflectance from turf and

quantify a value. Researchers have demonstrated high correlations among multiple turfgrass quality parameters with handheld CI and NDVI, making them robust, objective measurement tools. However, no attempts have been made to correlate these sensor data with a DIA system that incorporates NIR reflectance.

A dual-camera (regular + NIR) DIA system may be a convenient, reliable, low-cost alternative to handheld sensors for collecting turf quality data. Regular and NIR-modified digital cameras used in tandem can record RGB and NIR reflectance data for each image. These data could provide CI and NDVI information, as well as percent cover, DGCI, and traditional DIA measurements.

Furthermore, by combining DIA with drone technology, efficiency of collecting turf information increases dramatically. Drones provide the ability to image large areas, common in sports turf, in short time spans. For example, entire football fields can be imaged in minutes. By comparison, collecting imagery of equivalent area by hand would take several hours. Turf affected by various stresses, including water, fertility, disease, and insect damage, could easily be detected. In addition, because drones can collect information on entire areas in one image, effects of changing sunlight and cloud conditions are eliminated, increasing accuracy.

Research conducted at UNL in 2012 investigated effectiveness of a

drone-based, dual-camera (regular + NIR) DIA system for measuring CI and NDVI compared to handheld sensors. An ongoing deficit irrigation field study established in 2009 was used. Deficit irrigation was applied via a linear gradient irrigation system, such that turf closest to the sprinkler line source received 80% evapotranspiration (well-watered) and turf farthest received no irrigation (rain-fed); plots were divided into eight equal sub-plots that differed in irrigation and replicated four times. This design provided a broad range of turf qualities for analysis. Plots were mowed twice weekly at 2.5 inches, fertilized at 3 lbs N·1000 ft-2·y-1, and received regular pre- and postemergence herbicide applications.

Aerial imagery was collected using a custom-built, GPS-controlled hexacopter equipped with a digital camera (Pixobot, LLC, Lincoln, NE). Aerial imagery of Bowie buffalograss (*Buchloe dactyloide*), 4-Season Kentucky bluegrass (*Poa pratensis*), Apple GL perennial ryegrass (*Lolium perenne*), and Spyder tall fescue (*Festuca arundinacea*) was collected on 6 days approximately every 4 weeks from early April through late September. Imagery was collected in full sun between 1200 and 1400 hr. The NIR imagery was collected immediately following regular image capture. A CI and NDVI were calculated for each image using the RGB and NIR data. The CI was calculated as (NIR / Red) – 1 and NDVI calculated as (NIR – Red)/(NIR + Red), based on equations developed by previous researchers. Traditional DGCI (which does not use NIR) values were also calculated for comparison against CI and NDVI.

Turfarees	Handheld CI vs:		Handheld NDVI vs:	
Turrgrass -	Drone-Cl	Drone-DGCI	Drone-NDVI Drone-	
Buffalograss	0.78	0.75	0.71	0.71
Kentucky bluegrass	0.87	0.80	0.80	0.79
Perennial ryegrass	0.84	0.73	0.82	0.72
Tall fescue	0.87	0.74	0.82	0.75

▲ Correlations of handheld chlorophyll index (CI) and normalized difference vegetation index (NDVI) sensors among drone-based CI, -NDVI, and -dark green color index (DGCI). (n = 184 each; all results were statistically significant at the 0.001 level)

Chlorophyll index and NDVI data were also collected using handheld sensors. The CI and NDVI were measured using a Spectrum Technologies FieldScout CM 1000 chlorophyll meter and FieldScout TCM 500 NDVI turf color meter, respectively. Scores were averages of three random measurements taken in the center of each plot. Handheld sensor data were collected the same days as aerial imagery.

Our results showed strong correlations between drone-based CI and NDVI and handheld sensor data (Table 1). On average, drone-based CI data were highly correlated (R \approx 0.84) with handheld CI values across turfgrasses. Similarly, drone-based NDVI values were highly correlated (R \approx 0.79) with handheld NDVI values across turfgrasses. The

Future implications of drones in sports turf management are ongoing. Drones could be programmed to take off, fly routine routes, and land at specified time intervals, providing automated turf data over time.

drone-CI and -NDVI values were better correlated with handheld sensors than DGCI in all but one case.

These results suggest drone-based imaging using regular and NIR-modified digital cameras can provide information equivalent to handheld sensors. This allows CI and NDVI data to be collected in a fraction of the time required for handheld collection. Though our study used water-stressed turf, many other stresses and cultural practices have been correlated with handheld CI and NDVI, suggesting other stresses can be equally detected with drone-based DIA. These results also show addition of an NIR component to DIA increases ability to measure "greenness," illustrated by the stronger correlations with handheld CI and NDVI sensors than DGCI, which does not use NIR data.

MONITORING CHANGES OVER TIME

Drones can provide additional information valuable to sports turf managers. By using drones, changes in turf can easily be monitored over time. Furthermore, using drones to create GPS-based maps can easily pinpoint areas of turf stress. This information can then be used by sports turf managers to address the problem, whether it is increasing an irrigation zone run time to alleviate localized drought stress or increasing nitrogen fertility to correct chlorotic turf. With DIA, it is possible to model and calculate corrective measures (i.e., nitrogen rate must be increased by 0.20 lbs N·1000 ft-2 to alleviate turf chlorosis) with little error and simple mathematics, minimizing waste.

Future implications of drones in sports turf management are ongoing. Drones could be programmed to take off, fly routine routes, and land at specified time intervals, providing automated turf data over time. Drones could automatically detect turf problem areas with onboard software and generate GPS-based maps on the fly. If networked wirelessly to irrigation controllers, drones could trigger site-specific irrigation events to correct for localized dry spots detected during flight in real time. Drones also can be used to gather information other than imagery. Thermal-infrared imaging or infrared thermometers can measure turf canopy temperatures, which can indicate water stress. At UNL, preliminary work has begun on engineering drones for weed-control technology. The goal is to program drones to automatically seek, detect, and spray weeds with onboard herbicides. By providing a birds-eye view of turf, drones can quickly and efficiency gather useful information regarding turf status that can aid in management. Through DIA, drones can provide quantitative information about turf in a timely and efficient manner. Turf parameters such as "greenness" (via CI and NDVI), color, percent green cover, and various stresses can be detected quickly and easily. The information from drones can lead to better-informed decisions. Thus, drones offer many advantages to sports turf managers that ultimately save time, reduce labor, and lower costs. ■

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Make use of preemergence herbicides this spring

ummer annual weeds such as crabgrass and goosegrass commonly invade athletic field turf. The stress of foot traffic from athletic competition can leave athletic field turf susceptible to annual weed invasion (Figure 1). Crabgrass and goosegrass complete their life cycle in one year, germinating from seed in spring, growing throughout summer, and setting seed in fall. Summer annual weeds invading athletic fields need to be controlled in order to maximize field quality and safety.

An effective means for controlling summer annual weeds is the use of preemergence (PRE) herbicides in spring. A list of preemergence herbicides labeled for use on warm- and cool-season turfgrasses commonly found on athletic fields is presented in **Table 1**.

Weed control programs centered on the use of PRE herbicides offer many benefits to athletic field managers compared to eradicating these weeds with postemergence (POST) herbicides after they become established. For example:

• Athletic field managers have more herbicide options to control summer annual weeds PRE than POST.

• PRE programs are often more economical than POST programs that can require numerous sequential applications.

• Several PRE herbicides are available on fertilizer carriers allowing for granular applications to be made instead of liquid sprays.

Active Ingredient	Trade Name†	Formulations‡,¶	Labeled Species
prodiamine	Barricade	FL, WG	Bermudagrass Seashore Paspalum Tall Fescue Kentucky Bluegrass Perennial Ryegrass
dithiopyr	Dimension	EW, WP	Bermudagrass Seashore Paspalum Tall Fescue Kentucky Bluegrass Perennial Ryegrass
prodiamine + sulfentrazone	Echelon	SC	Bermudagrass Seashore Paspalum Tall Fescue Kentucky Bluegrass Perennial Ryegrass
pendimethalin	Pendulum	FL, G, EC	Bermudagrass Seashore Paspalum Tall Fescue Kentucky Bluegrass Perennial Ryegrass
pendimethalin + dimethenamid-P	FreeHand	G	Bermudagrass Seashore Paspalum
oxadiazon	Ronstar	G, FL, WSP	Dormant Bermudagrass (FL, WSP only) Bermudagrass (G only) Seashore Paspalum (G only) Tall Fescue (G only) Kentucky Bluegrass (G only) Perennial Ryegrass (G only)
indaziflam	Specticle	WSP, FL, G	Bermudagrass

† Active ingredients may be available under multiple trade names. Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the University of Tennessee Institute of Agriculture. The omission of a particular trade name is not intended to reflect adversely, or to show bias against, any product or trade name not mentioned.

 \ddagger FL = flowable; WG = water dispersible granular; EW = concentrated emulsion; WP = wettable powder; WSP = water soluble powder; SC = soluble concentrate; G = granular (not on fertilizer).

¶ Many preemergence herbicides are sold on granular fertilizer carriers. Be sure to follow label instructions to ensure that the correct rates of active ingredient and nutrients are supplied to turf when using these materials.

▲ **Table 1.** List of herbicide active ingredients labeled for preemergence (PRE) control of annual grassy weeds in warm- and cool-season turfgrasses commonly used on athletic fields.

• Likelihood for undesirable turf injury with PRE herbicides is low compared to applying POST products to remove established weeds such as crabgrass and goosegrass.

THINGS TO REMEMBER WHEN USING PREs

#1- Application Timing: Be sure to apply PRE herbicides before weeds have emerged from soil (i.e., before they are visi-

John Mascaro's Photo Quiz

John Mascaro is President of Turf-Tec International

Can you identify this sports turf problem?

Problem: Cement pad on sideline **Turfgrass area:** College football practice field **Location:** Columbus, OH **Grass Variety:** Perennial ryegrass and Kentucky bluegrass

Answer to John Mascaro's Photo Quiz on Page 33



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ble). These herbicides do not prevent weed seed germination; rather they prevent germinated seedlings from developing into mature plants. Considering that the timeframe between weed seed germination and weed emergence can be quite short, it is often recommended that PRE herbicides be applied once soil temperatures are favorable for crabgrass seed germination. Athletic field



▲ Left: Figure 1. Effect of simulated traffic on weed encroachment into hybrid bermudagrass in Knoxville, TN during 2013. Right: Figure 2. Effect of PRE herbicide treatments in spring on hybrid bermudagrass cover after being subjected to simulated traffic events in fall in Knoxville, TN in 2012 and 2013. Data were combined to present the effects of single and sequential application regimes at the rates tested in both years. Standard error bars presented as a means of statistical comparison.

managers should make their first PRE herbicide application as soon as soil temperatures (at approximately 2 inches) measure \geq 55°F for a minimum of 3 days in spring.

Researchers studied how the blooming of 74 different ornamental plants in spring corresponded with the emergence of crabgrass in turf. They concluded that blooming of border forsythias is a helpful indicator of when to apply PRE herbicides for crabgrass control. Border forsythias produces distinctive yellow blooms at soil temperatures similar to those that facilitate crabgrass seed germination and emergence. Thus, athletic field managers should be sure to apply PRE herbicides before forsythia plants have completed flowering each spring.

#2- Irrigation: A key to effectively controlling weeds with PRE herbicides is to water them into the soil after application. Most labels require that 0.25 to 0.50 inches of irrigation or rainfall be applied within 24 to 48 hours after application. These her-

Crabgrass plant's developmental stages



▲ Forsythia is in full bloom. The yellow petal drop has not started. *Photos and figure courtesy of Jeff Borger, Penn State*

▲ **Forsythia** yellow pedal drop has begun. About this time crabgrass will start to germinate.

▲ A visual representation of the preemergence herbicide concentrations in the top ¼ inch of the soil profile following an application in the spring of the year. bicides are absorbed by germinating weed seedlings in the soil, so moving them into the rootzone is critical. Failure to irrigate after application can also lead to material being lost due to volatilization. On fields without irrigation, try to time PRE herbicide applications around a period of rainfall.

#3- Split Applications: Split (also referred to as "sequential") application programs of PRE herbicides tend to provide more consistent control of summer annual weeds throughout a growing season, particularly in southern climates. These programs typically apply the total amount of active ingredient for the season in two equal rate applications spaced 8 to 10 weeks apart. A single herbicide application in spring for PRE control of crabgrass will slowly be broken down by soil microbial activity over the course of a summer often leading to crabgrass breakthrough by fall. Split application programs delivering active ingredient two times throughout a season tend to provide a longer period of control. Additionally, split application programs will control species germinating later in the year than crabgrass (e.g., goosegrass, etc.).

NO EFFECTS ON TRAFFIC TOLERANCE

Research has been conducted at the University of Tennessee Center for Athletic Field Safety (Knoxville, TN) evaluating the effects of four preemergence herbicides on Tifway hybrid bermudagrass traffic tolerance and recovery. Over the course of a 2-year study, no differences in smooth crabgrass control were detected among herbicide treatments after being subjected to athletic field traffic in spring; control measured 95 to 99% by 5 months after application. Additionally, these PRE herbicide applications for smooth crabgrass control had no effect on Tifway hybrid bermudagrass traffic tolerance to spring traffic.

Follow-up research at the University of Tennessee Center for Athletic Field Safety investigated the effects of PRE herbicide applications in spring on hybrid bermudagrass tolerance to traffic during the fall of the year. Similar to the initial study, PRE herbicide applications for summer annual weed control in spring had no effect on hybrid bermudagrass traffic tolerance in fall (**Figure 2**).

CONCLUSIONS

Numerous PRE herbicides are available for controlling annual grassy weeds on athletic fields. Always refer to the product label for specific information on proper use, tank-mixing compatibility and turfgrass tolerance. Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the University of Tennessee Institute of Agriculture. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science website at www.tennesseeturfgrass weeds.org.

J.T. Brosnan, G.K. Breeden, J.C. Sorochan, and A.W. Thoms University of Tennessee

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From high school to the big leagues: **ZOYSIAGRASS FOR SPORTS TURF**

▲ Dan Bergstrom of the Houston Astros in action last season. Photo courtesy of Houston Astros.

t Rangers Ballpark in Arlington,

TX home of the Texas Rangers, Dennis Klein, Director of Major League Baseball grounds, says he "would recommend zoysia." For several seasons, even during Word Series Games, the Rangers infield was grassed with Zeon Zoysia,

and then Y2 Zoysia, both developed by Bladerunner Farms in Poteet, TX.

"It did great," Klein says. "Zoysia is a little slower to establish than bermudagrass, and slower for the seams to lock together, but once it's in there and established it's really hard to hurt. We put it in in June and wouldn't replace a piece of grass on it until after the season. We went through a couple of World Series with it. The cutout at first and third base, and in front of the pitchers mound, you could beat balls into it and it wouldn't divot. It's really tough grass."

Klein says the Rangers installed the zoysiagrass infield at the request of the pitching coach. "We had been putting zoysia every year on the infield grass because we were able to maintain it at a taller height of cut to slow the ball down. The pitching coach wanted it tall and the zoysia ofinstalling the power cords runs across that hill. Concerts are a tough week for that hill and it stands up. We've been really happy with the zoysiagrass in that role," he says. "There was one time at a concert, a forklift fork was shoved into the hill and tore the grass. We replaced the divot and it healed back over the winter. I wouldn't expect to grow warm season grass in the winter but even some November damage healed."



▲ Opening Night at Minute Maid Park in Houston, March 31, 2013. Photo courtesy of Houston Astros.

fered varieties with more of an upright growing pattern, and a finer bladed type of turf that could handle the heat. That's why we went with it," Klein says.

This past season, the infield was grassed with 419 Tifway

bermudagrass, at the request of the infielder players who wanted a shorter height of cut and a faster ball roll on the infield. "The infielders like it fast. The pitchers like it slow. This year we had a better earned run average with it fast as opposed to when I had it taller to help the pitcher," Klein says. "Sometimes coaches over-read these things. In my eyes, both teams have to play on it. You either have players or you don't have players."



▲ The sloping, grassed hill in centerfield at Minute Maid Park in Houston features L1F zoysiagrass. Photo courtesy of Houston Astros.

At Minute Maid Park, home of the Houston Astros, Dan Bergstrom, senior director of major league field operations, says "I'm really excited about the new zoysiagrasses."

Although the field at the park is mainly grassed in seashore paspalum, Bergstrom has tested Zorro Zoysia, Zeon Zoysia and L1F Zoysiagrass in certain areas. Right now, on Tal's Hill, the slope at the rear of the outfield that is in deep shade for most of August and September, Bergstrom maintains 2,500 square feet of L1F Zoysia.

> "We put L1F on the hill and it has been absolutely gorgeous. It's got the esthetics we're looking for. We're able to mow it down tight under 3/4-inch. It's a beautiful color. It's a *matrella* with a super fine texture. It's wear tolerant. It's been bulletproof," Bergstrom says.

Tal's Hill gets different, more aggressive wear than the rest of the field.

"When a player makes a play on that hill, he gets there at full speed and stops at full speed, when he is chasing the ball to that hill. Every team that comes in does prac-

tice on the hill. The visiting center fielder will run up all over it for a half hour before batting practice," Bergstrom says.

"Our stadium tours go past the hill; it gets a lot of foot traffic. It's also the area immediately behind our stage for major concerts. All of our power cords, and all the traffic related to

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▲ South San Antonio High School's ball field grassed in Zeon Zoysia. Photos courtesy of Richard Mendez.

Zoysia has also been used on baseball fields at the high school level. Richard Mendez was the sports turf manager at South San Antonio High School in San Antonio when the field was renovated in October 2010. The original plan was to grass with bermudagrass but once he saw Zeon Zoysia, Mendez changed his mind. "It blew me away," Mendez says. "The feel of the grass, how when a ground ball is hit it slows the ball down because it is so thick, that was a good thing for our infielders, for the ball to slow down."

The base paths, infield, and outfield were all grassed with Zeon. Mendez says he noticed a difference in maintenance requirements almost immediately.

"I cut down my watering by 33%, if not more. This grass just needs less water," Mendez says. "I didn't have to run the sprinklers, especially during the tournament nights, so we didn't have to come to a wet field in the morning. For us it was a big plus, to be game ready a lot sooner for the morning game."

He also used less fertilizer on the zoysia than on the field when it was bermudagrass.

"We didn't have to fertilize but maybe a pound of nitrogen a year. That cut back our budget quite a bit. Our athletic director was pretty pleased about that, that we didn't have to buy as much fertilizer as we did with bermudagrass to keep it green," Mendez says.

He also no longer had to overseed the field.

"Maintenance costs were cut down in the fall and the spring because you didn't have to overseed anymore. The reason to overseed is to keep the body of the grass. Bermudagrass loses the body, zoysia does not. I wanted to paint it but we didn't. My test was that it would need to be green by the time our annual tournament came along in the second week of March. We had a green baseball field by then," he says.

Mendez says he sees a place for zoysia on sports fields.

"I think zoysia is going to be the grass of the future for sports fields because of the low cost of maintenance, especially in high schools, because school budgets are cut. If we can have less maintenance costs we can put that money into education," Mendez says.

Coach Donaldo Perez of Somerset High School in Somerset, TX guided his baseball team to the playoffs that were held at South San Antonio's field grassed with Zeon Zoysia. Perez says that both he and his players noted an improved difference on the zoysiagrass field.

"The grass at South San is so tight-knit. The ground balls to our players were so sound, a lot sounder than most fields. They were pure

ground balls toward you. The field plays real smooth," Perez says. "The grass makes a difference in how the ball is played. I felt that that field really was a really good field to play on. We had some true hops. There are other fields that you play on that are not the same. This was really player friendly, ground ball friendly."

Charles Harris is president of Buy Sod, Inc., a licensed producer and installer of Zeon Zoysia in Pinehurst, NC and a member of the The Turfgrass Group's Zeon production network. Harris says he's grassed two high school baseball/softball fields with Zeon Zoysia in North Carolina so far.

"Zeon is very fine-bladed and esthetically, it's a great turf. The ball rolls across it very well. It's very dense," Harris says. Using zoysia on the fields he's installed, he says, has pro-

duced "positive feedback

Although zoysia is a very dense turf and can withstand a lot of wear, "once damaged, it doesn't have as quick a recovery as bermudagrass," Harris says.

duced "positive feedback. They've been very happy with the result of what we've put in."

Harris says the key is for sports turf managers to be aware that maintenance requirements on a zoysiagrass field are different than on a bermudagrass field. "I think it's just people getting used to growing zoysia. You can't grow it like a bermuda-

grass. It doesn't need the same amount of nitrogen feed. It's a little slower growing so the maintenance practices are different. It's a learning curve as they get into it," Harris says.

Although zoysia is a very dense turf and can withstand a lot of wear, "once damaged, it doesn't have as quick a recovery as bermudagrass," Harris says. "So the question is, how will it recover? What is the threshold for the number of events it can withstand? In many ways, it's better for maintenance and esthetics, but what we have to consider is, is it the right fit for the facility? I think it needs to be experimented with more and used more. It's certainly is a very good turf for sports turf. It could definitely work very well."

Kevin Morris is the Executive Director of the National Turfgrass Evaluation Program based in Beltsville, MD. Morris worked at NTEP for 15 years with the late Jack Murray, the legendary USDA turf breeder who is credited with bringing many of the zoysiagrass accessions from Southeast Asia into the United States, including, among others, the turf that eventually became Zeon Zoysia.

Morris says NTEP recently completed a 5-year trial on zoysiagrass and the program has plans to launch a new zoysia trial this summer that includes some 35 unique entries. So far, most of the testing NTEP has done on zoysia has been for home lawns and golf use. The program has yet to conduct a wear tolerance test specific to sports field use.

Still, Morris says, "zoysia holds a lot of promise." He notes that although there are real distinctions between cultivars, zoysia, in general "does have better winter hardiness than bermudagrass." The grass can also survive in lower pH soils. "The whole pH and low maintenance aspects are where it has advantages over bermudagrass or the cool season grasses," Morris says.

Brian Schwartz, Ph.D., is a zoysiagrass and bermudagrass breeder at the University of Georgia. "Zoysia has a stronger leaf ... it doesn't wear a path as easily. It's a lower fertility input grass. So, from a benefit for the end user, they'll spend less on management and it maintains density. That's very important to an athletic field, that it maintains density with less input. If you fertilize bermudagrass with the same level of N, it would be alive but not as dense. I could see it working. That's why I think it would be a positive. There's better color retention into the fall. In the fall it doesn't change to the dormant color without a real freeze. Bermudagrass starts turning dormant, not only with cooler temps but with shorter day lengths. So, a lot of the zoysias need a freeze to turn them dormant. Some of them will be growing and recovering from a traffic event in the fall when there's football. So, that's a positive," Schwartz says.

"On the negative side, once the leaf in the canopy does get worn, it will have a harder time recovering as fast as bermudagrass," Schwartz says.

He says that he'd like to see more research on zoysiagrass for sports turf use. "I would love to see a football or soccer field grassed with 50 yards in zoysia and 50 yards in bermudagrass. That would be the coolest thing in the world for me. It would receive the same amount of wear and we would see which one would hold up. That's never going to happen, but it would answer 90% of our questions on one or two fields," Schwartz says.

"I just think there's a yearlong benefit of having zoysiagrass on a sports field like baseball or softball, where you're not worrying about wearing it out. For lower yearlong nitrogen rates, and less yearlong watering, you can keep the density so high and uniform with less inputs. Especially on a municipal level where you may ignore a field for a period of time, zoysiagrass could be ignored and you could get it back very quickly. At the lower input level, it could be very successful and beneficial for folks who can't keep up with the mowing rates and nitrogen rates that a high end bermudagrass would need," Schwartz says. "Add in some shade issues with stadiums, you have a fit for zoysiagrass for a lower requirement for light. Zeon would make a beautiful fit for stadiums because of shade."

Stacie Zinn Roberts is an award-winning writer and president of What's Your Avocado?, a writing and marketing firm based in Mount Vernon, WA





▲ Field #1: Sherri Parker Lee Stadium on the campus of the University of Tennessee, Knoxville. Photo courtesy of Darren Seybold. ▲ Field #2: Husky Softball Stadium on the campus of the University of Washington in Seattle. Photo courtesy of Tyler Clay.

Advice on maintaining softball infield skins

S *portsTurf* asked the following turf managers who maintain softball diamonds a few questions on how they make their skins better.

• Tyler Clay, University of Washington

• Herb Combs, CSFM, Athletic Field Supervisor, Intercollegiate Athletics, The Pennsylvania State University

• Jason DeMink, CSFM, University of Michigan

• Eric Harshman, Assistant Sports Turf Manager, University of Kentucky

• Tracy Schneweis, Sports Turf Manager, America Softball Association Hall of Fame Complex

• Darren Seybold, Director of Athletic Surfaces, University of Tennessee

What combination of clay products, amendments, moisture and maintenance routine do you use to keep the pitcher's circle in top condition?

Seybold: The infield consists of a high density red clay material that helps us produce a firm but not hard surface that can absorb a lot of water but not lose its ability to produce a quality footing, as well as smooth ball/surface interaction. Our team in the past has been built around the concept of speed and therefore the coaching staff wanted a "hard" surface. This material allows the agronomy staff to have enough water in the profile to provide the infielders with a tremendous fielding surface as well as accommodating the teams need to have a fast surface for their hitters to slap hit and steal bases.



Leaving your finished clay work a fraction of an inch below the rubber will promote less digging, and limit the opportunity for the surrounding surfaces to build-up. —*Tyler Clay*

DeMink: We patch daily and apply conditioner as needed. The only amendment we use is a natural clay enhanced with polymer.

Combs: We use mound clay for our pitching mound and cover it with a thin layer of amendment. The mound is repaired daily and watered as needed. To help maintain the overall quality and moisture of the mound we tarp when it is not in use.

Harshman: I water the infield (pitchers circle included) at least three times a day, if not more or less depending on weather conditions. I try to water the infield first thing in the morning. The first watering of the day consists of a heavy soaking, making sure the entire playing surface is well saturated evenly throughout. I then follow up with a water cycle before or shortly after lunch, cutting back on the amount of water from the first cycle of the day but still making sure to water evenly throughout the entire playing surface. The final water cycle is done right before practice or before a game. This cycle is done quickly, applying the least amount of water for the day. If done correctly the playing surface will keep a consistent moisture level for the entire practice/game.

Our infield mix consists of a high density red clay. All maintenance repairs to the infield (pitching lane, batters box etc.) are done with this same clay.

Our infield conditioner helps in maintaining proper and consistent moisture management. Like most infield conditioners this product breaks down over time and I apply fresh, new material when necessary and try to remove whenever possible.

There is no difference in my maintenance practices for the pitcher's circle. All maintenance practices for my clay surface are treated the same way for 100% consistency.

Clay: The upkeep of our clay surfaces (pitcher's circle, home plate and bullpens) consists of daily maintenance and repair of any holes which have resulted from practice or play. Our primary amendment used is a finer granule when compared to a basic



▲ Field #3: American Softball Association's Hall of Fame Stadium, Oklahoma City. *Photo courtesy of Tracy Schneweis*. ▲ Field #4: Beard Field at Nittany Lion Softball Park, University Park, PA. *Photo courtesy of Paul Curtis*. ▲ Field #5: Wilpon Softball Complex: Alumni Field on the campus of the University of Michigan. *Photo courtesy of Jason DeMink*.

amendment. We have found that the coverage and resiliency of the finer granule product is much better than the other products, ultimately countering the additional cost of that product.

Our maintenance routine is the most important component of keeping our clay surfaces safe, firm and resilient, especially with the prevalence of wet conditions in the Pacific Northwest Region. Our clay routine is as follows:

Scarify "action" area; going several directions to break down any high points and loose material.

Pull/brush back using a small broom, any loose material in and surrounding the said hole(s).

Once surface is "bare," we use a small hand sprayer (pump action) to wet the "bare" area.

You will not always need to wet the bare area; there is no need to saturate the surface.

Add the clay product to the hole first, avoid tapering off into the less disrupted and bare surfaces, avoiding this will help prevent the slow build up which commonly occurs. The deeper the hole, the more important it is to add the clay in layers to promote a solid bond and rid the clay of any pockets which may have formed. While layering, a quick mist of water before adding the next layer will promote a solid bond.

When tamping the clay material, use a firm downward action to initially pack the clay into the hole. Inspect layer tamped and add material as necessary. Regardless, finish tamp the surface, overlapping each tamp to produce a smooth surface.

It is important to not build your clay up to "flush" with the pitching rubber or home plate because when adding your finishing amendments such as Turface, you will be adding a layer which will bring the soil above the rubber. Leaving your finished clay work a fraction of an inch below the rubber will promote less digging, and limit the opportunity for the surrounding surfaces to build-up.

Once the clay has been thoroughly tamped, based on observed moisture in the clay, it may be necessary to apply a light coat of water before scarifying over the work to knock down any high spots, loose material, etc... will aide in the bonding of the top layer.

Using a rake, pull any loose material and debris to the center of the circle, dragging it over the clay work you have just completed, the dust and finer particles will work well as a "mortar" to fill any small cracks and openings in the packed clay. Remove the debris and material collected.

Finish groom/rake the circle.

Based on weather conditions and soil moisture, water as needed and tarp once moisture levels appear adequate.

Tarping is the other critical element of clay maintenance. This very tedious process will help surface hold-up better leading to less disruption and quicker maintenance turnaround.

Schneweis: Because I was new to the position (I started in April of 2013) and to the area, this past playing season was more of an experiment. Coming from a baseball background, I was also new to softball. We tried several types of mound clays and conditioners to see



what one(s) worked best for our fields. I wanted to test them all throughout the spring and summer and see which clay held up the best in the conditions we have here in Oklahoma. I also wanted to see which conditioners worked the best for the different types of clay we were trying.

Most of our events are youth tournaments that start on Friday and end on Sunday. During these events we re-pack all the clay on Monday. We have four fields here and all four receive the same attention on Monday. We don't do much, if anything to the pitching circles again until Thursday. On Thursday morning, we start managing the moisture again and adding water/conditioners as necessary. Friday morning we check all the areas to make sure they are safe and ready for the games, which typically start around 10. Friday night after the last game we re-pack all the clay and have them ready for Saturday morning. Saturday's games usually start at 8:30, so we try and get everything done the night before. After the last game on Saturday, we repack the circles again and have them ready for Sunday's games, which usually start at 8:30. If during the days any of the circles become unsafe with large holes, we will repack in between games. During the College World Series and the World Cup, we re-pack the circle between every game.

How do you keep the rest of the infield skin safe, firm and resilient?

Schneweis: Moisture control is the most important, and challenging, part of maintaining our fields. On a typical Saturday, when we are hosting a tournament, the games run from 8:30 am until 11:00 pm, or later. Games usually last an hour and a half and we have 10 minutes, at the most, to do all of our work: drag, chalk lines/batters boxes, etc. So trying to keep water on them in July in Oklahoma when it's 100 degrees is nearly impossible. We have irrigation heads behind the pitching circles that do a pretty good job of getting some water out, but usually we don't have enough time to do more than just settle the dust down. We try and keep a layer of conditioner (about ½ inch) on top of the fields to help hold some moisture in.

Obviously, weather conditions determine what we can, or need, to do for moisture. If there is no rain forecasted, we will start putting water on the dirt on Wednesday. We soak them all on Wednesday afternoon. We then monitor the fields all day Thursday and add water if necessary. Our goal is to have moisture throughout the profile by the time we leave the complex Thursday night. Friday morning we will check them all and determine if more water needs to be added.

During the day on Thursday, we also try and nail drag and roll the fields. This doesn't always happen; sometimes because of time constraints and sometimes because they don't need it. Rolling the fields with a ½-ton roller has allowed us to be able to seal off the top and hold some of the moisture in. It also "tightens" up the dirt, so it doesn't get as chewed up during play.

Combs: We maintain our infield skin daily with your standard infield maintenance equipment to ensure the safest surface possible. We manage our firmness with moisture and rolling the infield skin with a roller. We cover our infield skin with an amendment layer.

DeMink: We nail drag our skin daily; it helps fill in all those cleat marks. We also use a rain groomer on a Workman vehicle to level any high or low spots around first and second bases. If needed, we will roll the infield skin with a 1-ton roller. And we chain drag and use big brooms daily. Also we will broom twice during games to keep playing surface level and safe during games.

Seybold: The amendment that is currently being used helps retain moisture as well as provide a medium to slide and play the game. The surface is nail dragged at 1/8 inch to try to mitigate as many cleat marks as possible and a 1-ton roller is used sporadically during the season to aid in tightening the top quarter inch of material that is disturbed from the barrage of practice and games.

Clay: Our skin surface is evolved into a complex hybrid mix of several products over the past several years. Our last renovation included the addition of 30 yards of 70:30 (clay:sand) mix. This material was tilled into the existing ag-lime and then graded respectively. Moisture and continual maintenance are the two most important factors to keeping our skinned surfaces resilient. The use of amendments allows us to control our moisture levels, as well as keep the field firm and playable through the winter months. Once a low-spot is identified, address the issue as soon as possible and begin adding material to it. Based on soil composition and condition, tilling of the existing surface before, or during addition of material may be required. This will prevent the scope of your off-season renovations, as well as keep your surface safe and playable. It is a good idea to save and store some extra material for the maintenance of your skin surface throughout the playing season.

Following activity, based on the field conditions, spike or nail drag the skin to break down any chunks, a major disruption. If conditions permit, follow spike/nail drag with a matt/chain drag, allowing skin material to move and redistribute itself into low-spots much more efficiently. When dragging is completed, we remove any debris and foreign materials gathered by our drag mat. Once satisfied with the turnover, soak your skin surface to promote any re-bonding. Allow adequate time for material to settle before next activity. Additional fine tuning will be required around bases and one rake width around the surrounding edge of the skin.

Using a vehicle with worn or bald tread tires will act as a roller and allow the compacting of any loose material. To get optimal firmness and bonding, use a 1-ton ride on roller to compacts any loose material. Follow the process, Drag-Water-Roll-Repeat. Common spots we check are the lead-off/running lanes by all three bases and all position spots. The most observed traffic areas decrease respectively as you move from first base to third around the infield. Sticking to our maintenance program, as well as avoiding activity when conditions are wet and soft, allow us to maintain a resilient surface with a level grade.

What are your short and long term solutions to lip build-up?

Schneweis: Short term, we blow out the lips every Monday. Some weeks we use a backpack blower, others we use a 1-inch hose and wash them out. Once a month we try and "hard rake" them out. We take

a normal garden rake and go at a 45 degree angle and forcefully rake out the edges. We go back and forth a couple of times, one side to the other. It's amazing how much thatch, conditioner, etc., that we remove by doing this. We then rake the "trash" up into a pile and remove it from the field.

Long term is tough for me to say at this point. I would guess we will just re-sod the lips if they ever become unsafe.

DeMink: Lip prevention is done daily with push brooms, backpack blowers, and leaf rakes. Weekly I like to use a hose to blow it out with water. And, if needed, sod replacement.

Harshman: Short term, after daily practices, or normal usage: I come in and leaf rake all lip/transition areas pulling back material onto the infield that has found its way into the turf. After finishing up with leaf raking I use a backpack blower and get the material that has tried to imbed itself deep into the profile.

Long term: After heavy use: (camps, tournaments and weekend series) I will perform the same practices mentioned in the short term. In addition to that I will blow out all lip/transition areas with a water hose that is hooked up to a quick connect water source.

This process in my general maintenance is a delicate procedure. I make sure that the water pressure isn't full blast causing more harm

than good to the lip/transition areas. If your pressure is too high you have the potential of blowing out large chunks of your infield requiring you to come back in and make the necessary repairs to the clay infield playing surface. I regulate my water pressure making sure I gradually make small circular stokes along the grass edge blowing out all debris and material are free from working itself deep within the profile. By performing these practices I limit the amount of buildup over time that would eventually create an uneven transition between the clay infield and turf areas.

Seybold: The lips are "washed" out on all off days of all loose clay and conditioner that is worked in to the edge of the grass and during practice days or game days a backpack blower is used to remove as much conditioner as possible without damaging the grass to dirt interface on the edges. During the summer a roll of sod from the ring around the back of the skin is removed and replaced with new "fresh" sod to insure a clean edge is ready to go for the season.

Combs: We try and maintain our edges daily by sweeping or raking them after every use to minimize build-up. We edge the grass frequently to try and maintain a crisp edge. Our long-term solutions would be to flush the edges with a hose to try and flush out any infield material, if the edges are really bad we would just resod.

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DURABLE SOD FOR IN-SEASON REPLACEMENT

s I write this article, we are in the middle of NFL playoff season, my favorite time of the year. Not so much because of all the quality play and intense rivalries unfolding on the gridiron, but more to check out how the fields are holding up in the middle of winter, and at the end of a long, extended season. Yes I know, words of a true "turf rotor head." During the replays, I am checking out what type of traction the sod provided while everyone else is looking to see if the players' feet were in bounds.

Being in the sports turf industry for more than 20 years, I can begin to appreciate some of the many challenges the professional sports field managers face. We all naturally look to the pro groundskeepers for ideas on what's new, what's proven, and what's possible. We have seen the evolution of many products and practices at the professional level that eventually trickle down to college and amateur sports.

▼ Sod grown on plastic by Carolina Green Corp.'s sod farm in North Carolina.



The damaged stadium field was replaced following the concert and ready for immediate play (to view time-lapse video of field replacement log into

http://www.cgcfields.com/CarolinaGreenWebcam.asp and click on UVA Stadium Turf Replacement).

One area of advancement has been with in-season sod replacement. We see it on almost every natural grass NFL playoff game and college bowl game field this year. Either down the center of the field, or often the entire surface is replaced in a matter of a couple days with 1.5-2-inch thick sod that can withstand immediate play. Some replacements may look better than others, and field managers are great at masking the transitions, but all replacements have the same intent. Provide sure and consistent footing under a wide range of weather conditions. Sounds easy enough, especially with an NFL or bowl game budget, but what about for your high school field? Well, the industry trickle down is happening and here is the story.

THE HISTORY

The invention of big roll sod harvesters in 1991 was a big step in being able to provide thick, stable sod from farm to field. Slab and small roll versions were available before then, but a 42-inch or larger width roll really helped reduce the number of seams and allowed a more mechanized installation. Some of the problems include finding a good sod source and a farm willing to harvest thick cut. It is hard to convince a sod grower to change his cutting depth and truck off their most valuable resource (topsoil) in order to provide a field manager with heavy thick sod. Also, sod must be very mature and tightly knitted to hold together in a thick cut application, so planning a year in advance is necessary to secure a source.

Once the sod arrives at the field, there can be other problems. The thicker the sod is harvested at the farm, the bumpier it feels on the field. Also, if the farm native soil has high clay content, and you place over a drainage system, vertical drainage can be negated. When it does rain, the result can be a muddy, unstable surface. So the challenge became to develop a sod with a smooth uniform thickness, dense root system, a vertically draining root zone, and withstand 300-pound guys digging in with their cleats.

ENTER SOD GROWN ON PLASTIC (SOP)

I am actually not sure who came up with the idea of growing sod on plastic. It sounded crazy to me at first when I heard of a company in Georgia growing bentgrass on plastic for golf greens. The product was about ½-inch thick and basically looked like a grass floor mat. From there I heard of versions of sod grown on plastic being used for some NFL teams as opposed to traditional thick cut, but supplies were scarce, if non-existent.

In 2009 my athletic field construction company, Carolina Green Corp., was asked by The University of Virginia to provide a full field replacement following an in-season U2 concert. The damaged stadium field was replaced following the concert and ready for immediate play (to view time-lapse video of field replacement log into http://www.cgcfields.com/CarolinaGreenWebcam.asp and click on UVA Stadium Turf Replacement).

We opted to partner with a sod farm to produce that field, and from there developed Game-On! Grass, a sand-base bermuda sod system designed for immediate play situations. Since then the product, grown at our farm in NC, has been used for in-season turf replacements by Philadelphia Eagles, Washington Redskins, Tennessee Titans, University of Tennessee, University of Kentucky, University of South Carolina, Florida State University, and the University of North Carolina.

Most of these clients are able to plan for their sod needs months in advance, therefore much of the Game-On! Grass is reserved and grown under contract. In addition to those orders, we try to speculate on emergency needs and keep product on hand for smaller orders that pop up such as soccer goal mouths, position areas and in front of mound on baseball, lacrosse creases, and anywhere there is need to keep the games going. So the market is growing, and the result is that much more product is available for venues other than the NFL stadiums.

THE ROOT BOUND EFFECT

The basic principal in sod grown on plastic is exhibited in a potbound plant. When you pull the plant out of a container after it has been there too long, all you see is a mass of roots that can hardly be broken. The same thing happens with mature sod grown on plastic. The roots have nowhere to go and as a result form a dense mat. Topdressing is used to build the sod layer up to desired thickness. With our product we aim for 1.5-inch thickness which provides approximately 17 pounds per square foot total weight. One important characteristic of is that we use sand-base sod as an initial base, and then add topdressing sand typical for sand-base construction, therefore producing a sod that vertically drains and can be left in the field profile without impeding vertical drainage or contaminating the profile.

In growing this market we have had to overcome the perception that sod on plastic was a product that would have to be removed and replaced with regular cut sod after the "emergency" was over. Since most installations were in the fall/winter months, questions were raised if the grass would survive and root into the field the following year once the bermuda breaks dormancy. This was probably the experience with early thick cut products with heavy soils and much less total root mass. What we have found in all cases is that Game-On! Grass is the best grass on campus the following spring. It is thicker, greener, and quicker to break dormancy, and usually makes the grass beside it look inferior. The ability to control the rootzone profile of seems to be the difference both short term and long term with performance and survivability. In fact, a mid-field replacement in football practice field situation can usually be effective for an entire year cycle, making the additional cost more justifiable. We also have license agreements with patented protected grasses so we can provide a specific bermuda variety of Game-On! Grass to customers if requested.

COMPARE COSTS

No doubt SOP is more expensive than regular cut or thick cut sod, possibly anywhere from 2 to three times the cost. Freight costs are three times that of traditional sod due to SOP weighing at least three times that of traditional sod. The material and labor inputs at the farm are intense. Imagine growing anything on plastic in the summer with 1.5" soil layer. Not much margin for error, and no holiday time. So does that make it just an NFL product?

Here are some cost justifications I hear from customers. It keeps the field open year round for practice and play. In a situation where there is no additional space or no down time in the program, they can remain open with a few hour delay with SOP. They already



Kromer manufactures a complete line of athletic field maintenance equipment

have significant investment in a facility with lights, parking, bathrooms and such, so why not use the facility to maximum potential? It is the same argument used for considering synthetic turf. The alternative is build additional fields, go synthetic, provide fewer programs, all of which cost money. I would suggest compare cost of a new synthetic field annually over an 8-year replacement schedule compared to annual replacement with SOP down the center of the field along with additional goal mouth and lacrosse crease SOP replacement. Then ask your players what surface they would prefer to play on throughout the year.

This is not an answer to all situations, just a consideration. But having an alternative resource for intense-use natural grass field with minimal down time is a tool every field manager needs in the bag. The key to incorporating SOP into a turf management program is to plan ahead and secure a source. The supply of sod grown on plastic is limited, but we have seen several new vendors in the marketplace. Several of our clients have already ordered our product for fall/winter of 2014. We currently ship the product 12-15 hours from our farm, and are looking at possible satellite locations. So just coordinating trucking can sometimes be the biggest challenge. You also need a good prep and install plan for handling the turf. The equipment is similar to traditional sod replacement, but the added weight to move and manipulate the product creates an additional challenge. Removing turf from a field a few days before a big game involves a significant level of trust in the sod supplier and in the installer. For smaller jobs such as goal mouths, installing SOP in-house is a good option. Just remember if you are bringing in 1.5 inch, you need to remove 1.5 inch. That is a lot of soil.

BREAK OUT THE WAR PAINT— UNIQUE APPLICATIONS

In December 2011, WFI Stadium Inc. (FedEx Field) was faced with the task of logo replacement between games when they hosted the annual Army Navy Game less than 24 hours before Washington hosted the Patriots. The solution? Paint the



▲ The sod for an NFL game was pre-painted before being cut, transported and then installed.



▲ **Replacing** the turf at the University of Virginia's David A. Harrison III Field at Scott Stadium.

sod before its harvested. This had to be an historic first in the field replacement industry. The sod for the NFL game was prepainted before being cut, transported and then installed. Before the install, the grounds crew came to Carolina Green's sod farm in Indian Trail, NC to paint the midfield logo and end zones game. The sod was harvested, each roll numbered and logged, then transported to FedEx Field to await install. Management elected to only replace the in-field logos between the games and leave the Army-Navy end zones in tact as a tribute to the armed services. After the NFL game the end zones were replaced with the prepainted sod as well.

The "overnight success" of the WFI-Carolina Green field replacement industry milestone at FedEx Field was reasonably assured because the key sod grown on plastic component had already been field tested by the Philadelphia Eagles and declared a winner. Over the past 3 years the Eagles have used the product to replace just the sod between the hash marks and end zones of Lincoln Financial Field. Tony Leonard, the Eagles' director of grounds, reports, "The sod on plastic grown by Carolina Green provides us with a solid and stable playing surface in the middle of our field. We had to get through six games in November and this was the best choice for us to match up our existing bermuda grass."

Carolina Green Corp. is a North Carolina-based Certified Field Builder. They operate two Bermuda grass sod farms and employ 35 full-time employees and travel throughout the south & eastern United States constructing and renovating natural and synthetic athletic fields for professional, college, high school and recreation level use. The company can be viewed on the web at www.cgcfields.com. Chad Price, CSFM, CFB can be reached at 866-753-1707 or cprice@cgcfields.com.

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▲ North Myrtle Beach Park and Sport Complex. Photo courtesy of Ashley Wilkinson.

GRAND STRAND EXPANDS SPORTS TOURISM MARKET

or years vacationers have flocked to the Myrtle Beach area for family fun on the beach and on the golf course. Now, the Grand Strand has found a new market to attract visitors: sports tourism. While the Myrtle Beach area has seen the golf market level off, the sports tourism market has grown and city managers and business developers up and down the coast have taken notice. A marked expansion of athletic complexes along the 60+ miles of the Grand Strand has taken place over the past several years.

Among baseball enthusiasts it is no secret that Myrtle Beach is home to The Ripken Experience, a top-notch baseball facility with numerous synthetic fields. For years The Ripken Experience has attracted a large number of tourists in the travel baseball market and the facility continues to expand and improve. Another large scale investment has been undertaken by the city of Myrtle Beach. In recent years the city has added an impressive array of both natural and synthetic fields, highlighted by the outstanding baseball and multi-use facility at the Market Common, a high-end shopping and dining venue development. But perhaps the most aggressive expansion into



In April 2014, the city of North Myrtle Beach will open *a new 162-acre sports field park* to attract an even larger segment of the sports tourism market. The North Myrtle Beach Park and Sports Complex will include eight regulation size soccer fields that have been constructed for multiple field configurations. Four softball fields and two baseball fields are included in the site which is all planted in Tifway 419 bermudagrass.

John Mascaro's Photo Quiz

John Mascaro is President of Turf-Tec International

Answers from page 17

The cement pad on The Ohio State University's football practice field sideline is not actually a problem, but a solution to a problem. When these outdoor practice fields were renovated, one artificial practice field and two natural grass practice fields were constructed and two observation towers were built on each side of the artificial field. Once the team started to practice, the coach favored the natural grass surface and because the tower for filming and observation was located next to only one of the natural grass fields, that field was being over used and started to show signs of wear. To combat the wear problem, the Sports Turf Manager had four cement pads installed at the 50 yard lines and the end zones of the remaining natural grass field and covered them with artificial turf. He then purchased three movable scissor lifts and placed them on the pads to allow filming. Now with two natural grass fields and everyone, including the turf, is happy.

Thanks to Brian Gimbel, Athletic Grounds Supervisor at The Ohio State University in Columbus, for allowing me to take this photo.



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.



the sports tourism market has come from the city of North Myrtle Beach.

In April 2014, the city of North Myrtle Beach will open a new 162-acre sports field park to attract an even larger segment of the sports tourism market. The North Myrtle Beach Park and Sports Complex will include eight regulation size soccer fields that have been constructed for multiple field configurations. Four softball fields and two baseball fields are included in the site which is all planted in Tifway 419 bermudagrass. The softball fields have 225-foot outfields while the baseball fields stretch to 330 feet at the lines and 380 feet in center field. With the use of adjustable fencing the softball and baseball fields can accommodate almost any event played on a diamond.

While the new park will highlight sporting events, the attraction won't stop there. Twenty acres of lakes are included and will have water activities. Other amenities including playgrounds, an amphitheater, two dog parks, walking trails, and a well-manicured open field area for festivals have also been included. "We tried to create a sports complex within a park setting," said Jim Grainger, Public Grounds Superintendent for the city of North Myrtle Beach. But the park goes further than that. An effort to protect the local eco-system was integral to the construction process. Besides saving important local trees and plants for native habitat the park grounds are self-supporting from an irrigation standpoint. The ability to recapture the water that will be used reinforces the parks concept that sports tourism and turfgrass management can be an environmental partner.

The biggest winner in the construction of the new park will be the local economy. John Bullard, Director of Parks and Recreation for North Myrtle Beach, envisions a bright future for the park. "The park could have a \$15-\$18 million dollar economic impact for our area," he said. This could be, pardon the pun, a home run for the Grand Strand. The city of North Myrtle Beach began planning for the park several years ago and created general obligation bonds in the amount of \$15 million to establish the creation of the park. It's easy to see how quickly this investment could pay off.

Matt Gibbons, Superintendent of Sports Tourism, has been marketing the new park and says the response has been tremendous. "We knew we had to do more than 40 events in the new park annually. We thought we would do 60, but we are already at 70 events for the first year and we don't open till April!"

It's obvious that North Myrtle Beach will see the new park fill a need in the marketplace. Matt continued, "The park will have its grand opening by hosting the World Cup of Quidditch." Quidditch, a game made popular by Harry Potter films, has evolved into a huge sport, especially at the university club sport level. Matt shared that more than 80 teams and potentially thousands of spectators are expected at the grand opening World Cup event, only adding to the multiuse agenda of the park.

All this investment up and down the coast serves to increase the sports tourism market that continues to grow. So what's next for the Grand Strand? Has the area filled the void or even saturated it? Not yet according to Steven Rabon of S and R Turf and Irrigation, the contractor who built the sports fields at the new park. "We built 17 new fields around the Grand Strand in 2013 and are scheduled to build seven more nearby in North Carolina in 2014," Steven said. Perhaps the Myrtle Beach area will have to change its marketing strategy from the golf capital of America to the "Sports Tourism Capital of America." Only time will tell.

Ashley Wilkinson is a professor of golf and sports turf management at Horry-Georgetown Technical College in Myrtle Beach, SC.





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hile horses are, naturally, the focus of Thoroughbred racing fans, it is the ground beneath them that is the focus, if not obsession, of track executives. After all, it is the quality, fairness and consistency of a racetrack's surfaces that can make the difference between popularity and scorn, profit and loss, or even life and death.

For starters, owners and trainers want to race their horses over surfaces—be they turf, dirt or synthetic, the three main types in North America—that minimize the risk of injury. If a racetrack wants to attract the top horses in training, which translates into increased betting, they need to have perfectly groomed and manicured ovals. There are typically so many tracks running on any given day that horse owners have the luxury of choosing the ones that are kindest to their pricey investments.

Meanwhile, these racing surfaces need to withstand the pounding of weather as well as the pounding of hooves. If a turf course takes 2 inches of rain overnight, will it be dry enough to run across the next day without ruining it for weeks after? If there are thousands of divots in the grass from one race, will the maintenance team be able to have them filled before the next one? Gamblers prefer betting on turf races, so every time a contest scheduled for the grass course can't be run on its intended surface it can cost a major racetrack tens of thousands of dollars.

Consistency is also key. Handicappers insist on surfaces that give every horse a fair chance of winning, regardless of whether the horse is a "pacesetter" or a "closer." Surfaces that aren't cared for diligently are more likely to develop a "bias," which is racing parlance for a consistency that favors one style over another. If the soil is more packed together on the inside of a track, horses racing along the rail will have a distinct advantage because it will take them less effort to skip across it. Similarly, a turf course with too much water in it can favor the closers, horses who do their best running in the late stages of a race, as the early leaders will use up precious energy digging into the sodden ground. Anytime gamblers notice a significant bias at a track, they will wager less money because they perceive the races as unfair.

Safety is still another reason why high quality surfaces go hand-in-hand with good track management. If any of your material is too hard it can endanger the lives of horses and riders. The 1,200-pound horse running 40 miles per hour is more likely to break a leg if it is pounding its hooves on a dry course that plays like asphalt. Meanwhile, for the jockey that falls off, the "give" in a surface can mean the difference between career-ending paralysis and minor bruising.

It is with all of this in mind that the National Thoroughbred Racing Association, the membership-based trade organization with offices in New York City and Lexington, KY, has supported the Track Superintendents' and Arena Managers' Field Day since its inception in 2001.

"We started the track superintendent meetings to learn from one another, as well as share information about new techniques and technologies being used by other tracks," said George Mc-Dermott, former track superintendent at Lone Star Park, a pre-



the races as unfair.

mier Thoroughbred and American Quarter Horse racing venue in the heart of Dallas-Fort Worth that hosted the Breeders' Cup World Thoroughbred Championships in 2004.

Twelve years later, what started as a modest gathering has turned into an essential conference for track maintenance professionals. The 2013 Field Day, hosted in August at the Del Mar Thoroughbred Club near San Diego, attracted a record 120 registrants from six countries and US territories for workshops and presentations on the latest technologies affecting track maintenance. Participants earn credit for the Safety Training and Continuing Education component of the NTRA's Safety and Integrity Alliance Code of Standards, an industry initiative that assures best practices are in place at the nation's most recognizable racetracks.

"The 'track super' meeting has had great support by tracks in North America and we're now attracting managers from Dubai, Europe and Asia," said Roy Smith, track superintendent at Parx Racing near Philadelphia and a founder of the Field Day. "All are interested in the same goal: making the surfaces safe for the horses and humans, as well as providing the betting public the assurance of a level playing field for all competitors."

The gathering is especially important because racetrack maintenance is a specialty that, despite the billions of dollars that depend on it, can't be gleaned from a text book.

"You don't learn how to manage a dirt, turf or synthetic course in school," said Javier Barajas, track superintendent for both the Dubai Racing Club in the United Arab Emirates and Canterbury Park near the Twin Cities of Minneapolis and St. Paul, MN. "It's very much a hands-on learning experience and I've been glad to assist and teach others what works for me."

The significance of Field Day was reinforced earlier this year with

the addition of the event's first title sponsor in John Deere. At what is now known as Track Superintendents' and Arena Managers' Field Day Presented by John Deere, the tractor giant benefits from increased exposure in front of decision-makers who spend millions on coddling their terra firma, while track superintendents receive NTRA member discounts on equipment that can make a direct and significant impact to their bottom line.

Additional Field Day sponsors include Stabilizer Solutions, Toro, Hunter Industries, Valvoline, MD Barnmaster, Horsemen's Track & Equipment, AGCO's Challenger and Massey, Arbico Organics, Larcom & Mitchell, Equine Savings, Global Barrier Systems, and Duralock, Ltd.

"There is no comparable gathering for people invested in building and maintaining safe and fair track surfaces," said Bryan Pettigrew, senior vice president of NTRA, who spearheads the industry association's support of the Field Day. "Participation continues to grow, which just shows you that people are waking up to the importance of good track maintenance."

For information on the 2014 Track Superintendents' and Arena Managers' Field Day Presented by John Deere, contact Heather Brown at hbrown@ntra.com or 866-678-4289.



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TOOLS & EQUIPMENT

Check-up on equipment maintenance:

interview with Erik Sides of the Equipment & Engine Training Council

Editor's note: Erik Sides is the executive director of the Equipment & Engine Training Council, York, SC, eetc@eetc.org.



SportsTurf: What are the three most important routine (daily or monthly) maintenance tasks turf managers should do with their mowers?

Sides: Really simple here; each manufacturer usually has a daily/monthly/yearly check list of maintenance items to check. If we set aside some time to check these items as indicated by the manufacturer maintenance check list we could prevent a lot of headaches in the future.

Check fluid levels as suggested by manufacturer. Example: checking fluid levels as required would help us identify if the unit is leaking/using oil early on. A lot of times a leak or issue internally starts out small and gradually gets worse with more use. If we identify the loss of fluid early on it can save headaches and budget dollars.

Check for loose/worn/damaged components/parts/hardware. Example: This really becomes important on hydraulic driven mowers, chaffed/nicked or kinked hydraulic hoses. Generally these damaged hoses will burst when mowing the ball field or prize area causing damage to the turf.

Operator awareness/training. Although this is not on the maintenance checklist, having a well trained operator that stays alert of the unit and his or her surroundings is well worth the time and investment. Operators should be trained on proper operation but also about the warning indicator lamps/alarms and gauges. An alert operator trained what to do in case of an alarm or indicator light can prevent altogether or lessen the damage that may occur. All manufacturers have an Operator Manual that details operation procedures and details what alarms and warning indicators are and what to do when is activated. If you do not have the manual search the manufacturer's website and download the manual. Develop a training program to cover each type of unit you have in your fleet. This can save not only maintenance budget but also has the liability risk to it as well.

ST: Is there something turf managers can do a few times annually that will increase life and performance of mowers?

Sides: Follow recommend fluid change intervals as per the manufacturer recommendations; if you pay close attention you may see a little statement that says (In Extreme/Dusty working conditions change fluids at XXX). Extreme working conditions could be high ambient temperatures (xx) degrees, or under a heavy load for long periods of time, etc. If the fluids operate in extreme temperatures they will need to be changed more often.

The air intake system is another one that may be overlooked. Look for loose/damaged air intake hoses/clamps/housing and change the filter at least once a year if not more. Follow manufacturers' recommended change intervals. Do not blow the air filter off with compressed air or bang up against something to clean. This will damage the filter medium and or damage the seals, replacing the filter is always best. Do not remove the filter/cover to check filter condition if equipped with a filter condition indicator. This keeps the possibility of dirt being introduced into the unit. Engines and dirt do not mix well and is expensive when it does happen.

One other item to be sure of is when washing the unit, **it should be shut off**. I have seen bent piston rods where water was sucked in while engine was running.

ST: How large of an operation, like a college or school district, do you think can support having an in-house mechanic?

Sides: That's hard to say because of so many variables but looking at the annual maintenance budget and what is out-sourced vs. what is done in house would be a good start in making that decision. If you have had to replace complete units because of poor maintenance then this may be also be a deciding factor.

Some dealers do offer a yearly maintenance service program that can be used for smaller fleets but someone still needs to have the ability to perform the daily maintenance checks and setups suggested by the manufacturer.

ST: What's your advice for keeping smaller equipment like trimmers running their best?

Sides: Keeping the filter clean and the fuel quality. Ethanol in fuel has shortened the shelf life of gasoline. When moisture develops over time issues with small equipment take place causing idling issues, weak performance or no start conditions. This then becomes quite expensive for repair if not caught early.

Keep the fuel treated with a quality fuel stabilizer like Ethanol Shield year round. This will protect the fuel system from stale fuel as well as protect it from the harmful effects of ethanol.

ST: In your experience what are the most costly mistakes people make when it comes to equipment maintenance?

Sides: 1. Not having a plan (maintenance checklist). 2. Not following through (routine, routine, routine). 3. Not keeping accurate records (tracking parts used, hours when serviced etc.) 4. Not following proper procedures (can lead to more expense or liability exposure).

TURFTIME EQUIPMENT ADDS PRO-AERATORS TO ITS PRODUCT LINE

These commercial grade aerators offer affordable pricing for schools, landscapers and estate owners. With rugged steel construction and greaseable bushings on a 1" diameter shaft, the Pro-Aerator comes in widths of 42", 63", 84" and 105" and is operated behind 18-30 HP tractors. Coring spoons reach up to 4" depth depending of soil conditions. Independently mounted spoon wheels allow easier turning and minimize turf damage.

EP MINERALS LAUNCHES GAME CHANGER BASEBALL INFIELD CONDITIONER

EP Minerals, LLC announced the launch of Game Changer, a new clay conditioner designed specifically for baseball infields. Game Changer features patent pending KT3 surface technology, formulated to keep baseball infields moist, not muddy, while controlling dust and reducing water usage. When combined with the infusion of a proprietary blend of non-ionic surface treatment, Game Changer uses the absorptive properties of calcined clay as a conditioner to allow more water penetration. The product provides increased moisture retention even in extreme heat, lower water applications, and great dust control. That means reduced water costs and less maintenance, all with better playing conditions. EP Minerals has developed four versions of Game Changer for different infield uses: Game Changer with KT3 Technology, Game Changer Regular Conditioner, Game Changer Mound Clay, and Game Changer Drying Agent. **EP Minerals**

NEW INDOOR "TERF"

ECORE International's Terf provides cushion underfoot, has sound isolating advantages, and adds a significant environmental story that does not exist with any other turf product. Terf was designed with an athlete's body in mind. Of particular importance is force reduction, which measures and evaluates a flooring system's ability to reduce impact, especially to the lower extremities. Terf is designated for indoor use only and meets specifications for competitive field hockey, lacrosse, and soccer fields. It is spike-resistant and ideal for heavy indoor sports training, including use with football pulling sleds and speed schools that promote speed, power, strength, flexibility, and endurance training. Terf is manufactured by fusion-bonding a nylon wear layer to ECORE's recycled rubber underlayment.

ECORE International

MARLINS PARK CONVERTS TO PLATINUM TE PASPALUM

When the Miami Marlins take the field this spring, the new Marlins Park stadium will feature a complete field conversion to Platinum TETM Paspalum turfgrass. Platinum TE meets specific performance needs of the team and of the retractable roof, warm season stadium, as well as addressing environmental priorities, such as predictability and reduced water and nitrogen usage. "Everything changes when you factor in a retractable roof," said Chad Mulholland, director of grounds for the Miami Marlins. "Field temperatures can reach over 100 degrees during the day and drop to as low as 72 when we close the roof on game days. But even more challenging is the shade. There are days when some areas of the field get no sun at all." **Turf Ecosystems**

MEAN GREEN CLEANER & DEGREASER

With a blend of biodegradable detergents, Mean Green Industrial Strength Cleaner & Degreaser quickly cuts through grease and grime, speeding maintenance, repair and rebuild projects. This proven product contains 40% more cleaning ingredients to dissolve grease and grime more quickly than other cleaners. With 30% more solvents and 20% more surfactants, even the most stubborn stains are quickly removed from various industrial surfaces - including metal parts and housings, painted surfaces, vehicle interiors and exteriors, shop interiors and concrete flooring. Mean Green has doubled the amount of chelating agent. It is ideal for use with pressure washers. **CR Brands**, Inc.

NEW PRO LEAGUE CHAMPION BROWN FROM TURFACE

Turface Athletics introduces Pro League Champion Brown, the fourth color to its lineup of infield conditioners. Like all Pro League products, Champion Brown features smaller, uniform particles designed to ensure the ultimate fielding and sliding surface to keep skinned infields safe and playable. Moisture management is critical in keeping skinned infields playable. All Pro League conditioners absorb their weight in water to prevent puddles on the infield and stave off rainouts. That absorbed moisture will later release to prevent a hard, cracked field when it's dry. In addition to Champion Brown, Pro League conditioners come in Natural, Red and Heritage Red colors. Turface

Turf Time Equipment











TOOLS & EQUIPMENT

GRIGG BROS INTRODUCES RHIZONIFY, SOIL SPECIALTY PRODUCT

Introducing Rhizonify, a new technologically advanced, value-added formulation from Grigg Brothers designed to facilitate the interaction of turfgrass roots with water, nutrients, and sugars in the rhizosphere to improve rooting, enhance plant energy status, and promote turfgrass vigor in challenging soil conditions or during environmental stress. Applications of Rhizonify enhance and replenish plant and soil carbohydrates in the rhizosphere to successfully overcome limitations encountered during many conditions turfgrass managers face. Placement and solubility of the carbohydrate and nutrient contained in Rhizonify determine its efficacy.

Grigg Brothers











JACOBSEN LAUNCHES CONTOUR ROTARY MOWER

Jacobsen has launched the new AR722T contour rotary mower, designed to maintain sports and recreation fields. The AR722T features a 65.2 hp Kubota turbo-charged diesel that delivers performance and blade speed in the most challenging terrain without slowing down. The new AR722T is equipped with the SureTrac parallel-cross-series traction system, which provides superior performance on hills. The AR722T's advanced weight transfer system allows for balancing of the machine's weight between the traction unit and decks for optimal traction and ground following in varying terrains. The AR722T is also equipped with Jacobsen's exclusive TrimTek decks that feature a downdraft blade for superior mulching capabilities.

Jacobsen

NEW CUSHMAN HAULER PRO UTILITY VEHICLES

Cushman introduces a fully electric Cushman Hauler PRO with a 72-volt AC drivetrain that provides the range and power once exclusive to gas-powered machines in a silent, zero-emissions vehicle. Cushman vehicles are manufactured by the E-Z-GO Division of Textron Inc. The new Hauler PRO features a 72-volt AC electric drivetrain, upgraded from more traditional 48-volt systems, that offers up to 50 fully-loaded miles of range between charges. The patented AC Drive technology also ensures that the Hauler PRO maintains consistent power and performance from the first pre-dawn chores to the last light of dusk, without the noisy drone of a gas engine.

SAPIP-IRT WIRELESS IR LEAF TEMP SYSTEM

The new SapIP-IRT wireless infrared temperature system from Dynamax, Inc. is the latest development in IR leaf temperature sensing for use in irrigation scheduling and plant stress detection. This new system allows for small IRT nodes to be distributed up to 500 meters (1600 ft) apart throughout a field, and data to be collected with a single wireless modem. Data is then displayed and graphed on a website where data files can also be downloaded to your PC. Plant stress models are used to determine if, and when, your crops need irrigation, and flags are used when irrigation is required.

Dynamax, Inc.

FMC INTRODUCES TRIPLE CROWN T&O INSECTICIDE

A multiple action insecticide providing fast-acting, long-lasting broad-spectrum control of more than 30 above- and below-ground turf and ornamental pests, Triple Crown® T&O insecticide is now available from FMC Professional Solutions. Triple Crown is a three-way combination of FMC bifenthrin, FMC zeta-cypermethrin and imidacloprid, offering multiple modes of action on key pests including ants, fire ants, grubs (masked chafer, European chafer, and Japanese beetle), chinch bugs, annual bluegrass weevils, ticks, mites, billbugs, mole crickets, and more. Research among university specialists in various parts of the country has shown that Triple Crown delivers fast results against damaging annual bluegrass weevil and billbug adults, chinch bugs, mole crickets and many other insects. **FMC Professional Solutions**

SISIS TO LAUNCH TWO NEW MACHINES

SISIS will be introducing this year the Rotorake 600HD pedestrian de-thatcher and the Rotorake TM1000 tractor mounted de-thatcher which now features a new interchangeable reel system. Along with the two new machines, which are being launched into the US market for the first time, will be the highly popular Veemo MK2 heavy duty tractor mounted de-thatcher, Auto Rotorake MK5 self-propelled heavy duty de-thatcher and Multislit 1200 tractor mounted deep slitter. The Rotorake 600HD is a heavy duty pedestrian de-thatcher and linear aerator which can be used for regular, routine use at a shallow setting or a deeper setting. The SISIS Rotorake TM1000 is a tractor mounted unit which is now available with five quick release interchangeable reels to aid the removal and control of thatch and help reduce standing surface water by improving water infiltration. **SISIS**

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BEACON TARP CART WITH TARP PIN HOLDERS

This cart is a great addition to your grounds crew. Designed to store and transport up to four area tarps and your field weights or tarp pins. Conveniently keep rolled up tarps and pins together for easy transport and storage. Perfect for stowing area rain tarps, weighted tarps, infield protectors, sideline turf protectors, track protectors and growth covers. The cart may be manually pushed along in wheelbarrow fashion or towed by a utility vehicle **Beacon Athletics**

SWEEPER CUTS MAINTENANCE TIME ON SYNTHETICS

The 3-three-wheel Broce Turf Boss sweeper can groom a typical turf field in a single pass, with full 8' brush contact, reducing field maintenance time by up to two-thirds. Its reversible brush rotation, included as standard equipment, can double productivity by allowing the operator to sweep in both directions without turning around. Turf Boss sweeper's hydraulics are engineered to deliver more power to the brush, which enables full brush-turf contact for faster field maintenance. To combat overheating issues on turf fields, its radiator is designed to operate in 140°F ambient temperatures. It is the only sweeper of its kind to incorporate a hydraulic oil cooler as standard equipment. Comes standard with turf-specific 12-inch wide tires that tread lightly on turf.

Broce Manufacturing Co.

SELF-PRIMING CENTRIFUGAL PUMPS

Griswold Pump Company says that its H Series high head self-priming centrifugal pumps have been designed with key features and options that make them ideally suited for a wide variety of water applications, including turf irrigation where greater flows and higher heads are needed. Unlike standard end suction centrifugal pumps, the H Series is able to maintain its prime even when check valves or foot valves have failed. Since the suction line on the H Series is located higher on the pump housing than conventional centrifugal pumps, it keeps the impeller and mechanical seal covered with water at all times eliminating the need to re-prime the pump and protects the seal from running dry resulting in costly replacements. **Griswold Pump Company**

KATANA HERBICIDE EARLY ORDER AND BUNDLE BONUS PROGRAM

Professional sports turf managers can get a head start on next year's maintenance plans while conserving valuable budgets with an early order incentive and product bundle bonus program, available from PBI-Gordon Corporation, for its Katana Turf Herbicide. The program includes different opportunities to save: Katana Incentive, with a minimum purchase of eight bottles or two cases of Katana, you can receive a \$100-per-case rebate. Katana is packaged with four 3-ounce bottles per case (receive \$100 per case with each additional case after minimum is met). Also Bundle Bonus Rebate, add 10 gallons of SpeedZone and/or SpeedZone Southern to each case of Katana ordered and earn an additional \$2.50 per gallon rebate on the SpeedZone products. Early delivery bonus also available.

BAYER CROPSCIENCE INTRODUCES SPECTICLE PLUS FERTILIZER

Environmental Science, a division of Bayer CropScience LP, has launched Specticle plus Fertilizer, an herbicide that provides warm-season turf managers up to 8 months of residual control at low use rates. The characteristics of Specticle deliver excellent weed prevention and fertility. Specticle plus Fertilizer is available in two different concentrations and a variety of fertilizer blends to provide for increased flexibility that meets the needs of warm-season turfgrass professionals. Specticle is a unique class of chemistry that offers an environmentally responsible solution and helps address weed resistance. Specticle plus Fertilizer delivers extended residual pre-emergent control of more than 75 broadleaf and grassy weeds, including annual bluegrass, goosegrass, crabgrass and annual sedge. The easy-to-use Specticle plus Fertilizer helps streamline turf management practices and simplify application. **Bayer**

GET RID OF GEESE

Canada Goose deterrent company Away With Geese has a new product: the Sports Cage. The Sports Cage protects the Sports Unit, a unit designed to avert theft in public spaces, from vandalism. The two together get rid of Canada Geese from any public area, while also averting theft and vandalism of the unit. All Away With Geese products feature a solar-powered light that is scarcely noticeable to humans but is very disruptive to the sleep of the geese, causing them to find another habitat after just a few restless nights. Like all Away With Geese units, they are maintenance free; once placed and secured, they require no upkeep and are guaranteed to rid the area of Canada Geese. **Away With Geese**















FLORIDA ATAATAA ATAATAA UNITED STATES OF THE SOLUTION OF THE SOLUTION OF THE STATES OF

Located in south Florida, FAU is a premier location to host collegiate invitational tournaments including the 2012 Sunbelt Conference Championship tournament and upcoming 2014 Conference USA Championship tournament. With our conference games, invitational tournaments, fall softball games and fall Lady Gator Softball Tournament the field hosts 80-100 games a year. In addition to FAU daily practices, the field is also used for two winter softball camps and as a practice facility for the Phoenix travel softball team.



- Level of Submission: College
- Category of Submission: Softball
- Head Sports Turf Manager: Ken Czerniak
- Title: Sports Turf Manager
- Education: High School
- Experience: Worked 10 years at the Texas Rangers spring training facility in Port Charlotte, FL

starting as a laborer and working to the assistant field supervisor. In 2003 became the head sports turf manager for sports field management taking over the supervision of 30 acres at Florida Atlantic University.

- Full-time staff: Phillip Bathalon, Casey Myers, and Micah Bennett
- Original construction: 1999
- Turfgrass variety: Celebration bermudagrass
- Overseed: Double Eagle Blend perennial ryegrass seeded at 7 pounds per thousand with an extra 200 pounds to spot seed position spots and sidelines during the months of January and February.

WHY STMA SHOULD CONSIDER YOUR FIELD A WINNER?

This softball field is home of the Florida Atlantic University (FAU) Owls and maintained by sports field management with a crew of four. Spring at FAU is a challenge with competing schedules of NCAA Division I baseball and softball programs. Located in south Florida, FAU is a premier location to host collegiate invitational tournaments including the 2012 Sunbelt Conference Championship tournament and upcoming 2014 Conference USA Championship tournament. With our conference games, invitational tournaments, fall softball games and fall Lady Gator Softball Tournament the field hosts 80-100 games a year. In addition to FAU daily practices, the field is also used for two winter softball camps and as a practice facility for the Phoenix travel softball team.

Before the 2013 season, the infield was considered hard and caused balls to bounce high. The hard infield was a result of brick dust topdressing as it

FAU Softball Stadium

tends to not hold water. A softer infield was wanted to produce more ground balls. FAU coaches and administrators verbalized their concerns regarding the infield including the poor drainage associated with it. However to produce immediate results the field would have to be renovated, a project the budget could not support. Maintenance to minimize this problem involved multiple daily watering that became very inefficient for the crew. This year our crew made a positive impact as our challenge was to address this long-standing issue.

In order to mitigate the hard infield we softened the home plate area out to where ground balls would be hit. Our strategy was to add quick dry as it retains moisture, thereby creating the desired softer surface. Once the quick dry was incorporated we were able to dramatically shorten our watering regime.

A result of hosting 79 games in two months is that position spots become a real concern. Multiple strategies were incorporated from the previous year to minimize damage done to these spots. Specifically we raised our height of cut and stretched out mowing days to keep the grass blade longer. We also aer-

ified the field twice during the season to control compaction.

Our crew was able to take a problematic hard infield and with creative practices make a softer infield that was better for the coaches and players. With unpredictable weather we were able to maintain a quality safe playable field throughout the season.

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

Czerniak: I believe face to face is the best way to communicate, but most of the time communication is done by email or by phone. I try to speak with coaches and administrators on a weekly basis to see if anything has deviated from the previously provided schedules. My assistants speak to the coaches daily just to touch base. The tip I would give is to talk to every coach and listen to their concerns and ask them if there is anything you can do to benefit them and help make things better.

ST: What are your specific responsibilities?

Czerniak: As the Sports Turf Manager at FAU for Sports Field Management, my responsibilities include maintaining 29 acres of bermudagrass, one synthetic field, and overseeing the day to day operations of all our fields. The operations include but are not limited to the mowing schedules, painting schedules and fertilization program. The scheduling helps provide direction to my five employees (Phil Bathalon, Casey Myers, Micah Bennett, Tyler Cornish, and Danny Bradley), and allow us to complete our work at a professional level.

ST: What tasks do you find most enjoyable?

Czerniak: Creating and mowing patterns is most enjoyable to me. While burning patterns in for periods of time helps with the aesthetics, I also rotate my patterns. Rotating patterns prevents ruts from the mower which helps with both safety and playability.

Equipment List

- Toro Reel Master 5510
- Graco Line Lazer 3400
- McLane (edger)
- Kubota M5040 (tractor)
- Wiedenmann Super 500 (vertical mowing machine)
- Toro ProCore 864
- Toro Workman HD
- Toro GreensMaster 3100 with vertical mowing reels
- Kubota LA211 (front end loader)
- John Deere 1200A (infield drag)
- Stihl BR550 (blower)
- Tycrop (topdresser)
- Toro Low Profile 175 (spray rig)
- GreensGroomer (turf brush)
- Lesco backpack sprayer
- Scotts Turf Builder Classic (drop spreader)
- Lesco Commercial Plus (rotary spreader)
- GEHL 6635 SXT (front end loader)
- Volvo DD14 (5 ton roller rental)
- Ryan (sod cutter)

ST: What task is your least favorite and why?

Czerniak: My least favorite task has to be pulling the tarp for softball and baseball and then getting the field back in a safe and playable condition. Our small staff at games makes these situations more stressful and challenging. Due to the heavy rains in south Florida, we have our fair share downpours throughout the year.

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

Czerniak: My father was a golf course superintendent and my love for baseball influenced me toward this career. I was lucky to have a spring training home in Port Charlotte with the Texas Rangers. One day I was playing golf with Tom Burns and Tom Vida, the

sports turf managers with the Rangers, and asked if they needed help. I started as a laborer in 1993 and worked my up to assistant sports turf manager in 2000. I was very lucky to have them both take me under their wing and share their knowledge and past experiences. They both helped shape me into who I am today. I started at FAU in 2004 and I'm still here today.

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

Czerniak: Our practices include nail dragging, dragging, and watering. We also re-level position spots and the lead off areas around the bases with infield clay. On a regular basis, we assess our conditioner coverage and correct it if needed by adding or removing material. We are consistently maintaining the pitching circle and home plate area to achieve our professional standard.

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

Czerniak: We are continuing the strategy started last year of incorporating calcined clay by recycling the clay from our recent baseball field renovation. We will be raising our bullpens and laser grading our infield to prevent runoff water from sitting in those areas. We will also move four heads to help get better coverage over the entire field. We will be putting up barriers along parts of our warning track to prevent any material from washing away.

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

Czerniak: With an increase in pesticide and fertilization application laws, there will be more training required to apply such products. Also, as our field usage and the number of events increase each year, cultural practices and time management will become much more important.

STMA in action



CSFM program nearly eclipses record

In 2013, the STMA Certified Sports Field Managers (CSFM) Program added 19 members to its rolls. This is the second highest number of members certified in one year. In 2010, there were 22 members who attained this designation, which is the highest in the program's history. The CSFM program began in 2000, and it currently has 169 certified members.

The program was established to validate the experience and qualifications of a sports turf manager. Those seeking certification must attain 40 points before being able to take the exam. Points are gained through a combination of formal education and work experience. The four-part exam covers agronomics, sports specific management, pest management and administration. Those testing may elect to take the test at the annual STMA conference or at a location and time convenient to them by using a proctor. Continuing education and service to the industry are also required to maintain the CSFM designation.

Consider adding value to your employer and to your personal marketability by becoming certified. CSFMs also are paid more. On average, a CSFM makes \$7,500 annually more than a non-certified member.

To find out more about the certification program and what it can do for you, go to www.STMA.org, and click on Certification under the Professionalism Tab.

Congratulations to the Class of 2013! Weston Appelfeller, CSFM, Columbus Crew James Bergdoll, CSFM, City of Elizabethtown Jeff Bosworth, CSFM, Drake University Noel Brusius, CSFM, Waukegan Park District Jason Demink, CSFM, University of Michigan Athletic Department Michael Flowers, CSFM, Championship Turf Services James Gish, CSFM, Brigham Young University Shane Hohlbein, CSFM, Precision Turf LLC Chris Hohnstrater, CSFM, The Principia School Michael Hrivnak, CSFM, Town of Cary David Iannicello, CSFM, Sodexo Campus Services at Hobart & William Smith College Shane Johnson, CSFM, City of Clinton Parks & Rec Ryan McCaughey, CSFM, The Pennsylvania State University Kevin Mercer, CSFM, Vassar College Allen Reed, CSFM, FC Dallas Kyle Slaton, CSFM, Georgia State University Robert Standing, CSFM, Carolina Green Corp. Brett Tanner, CSFM, DePauw University Scott Thompson, CSFM, Duke University

Continued from page 7

I will leave you with this story about a group of people who made a difference. I am fortunate to work in Lexington, where more than 200 years ago an unlikely collection of farmers, shopkeepers and tradesmen decided to make a difference and take a stand. Little did they know that it would lead to independence and a new country. Although what we do is not on the same scale, we do make a difference in the lives of the people using our facilities. By providing well-maintained, safe, aesthetically pleasing athletic fields we show our commitment for the betterment of others.

Let's work together to make a difference in the sports turf industry and make 2014 a great year.

Deltime et



Membership Application



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

New Members*

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

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

Person who referred you:

Facility name:

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

Name		litle		
Employer/ Facility				
Business	Home			
Address				
City		State	Zip	
Home phone	Work	Се	911	
Fax	Er	nail		
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:	
O Professional Sports O Higher Education O Schools K-12 O Parks and Recreation	
C Academic	\$95
Student (verification of enrollment)	\$25
Commercial	\$295
Commercial Associate* (Additional member(s) from the same commercial company)	\$75
Affiliate (Person who is indirectly or on a part-time basis, involved in the	
maintenance/management of sports fields)	\$50
Retired	\$50
Chapter Dues (contact headquarters for amount) Chapter name)	\$
Contribution To SAFE Foundation (research, education and scholarship):	\$
Total Amount Enclosed:	\$
Payment Method:	
Check Doney Order Purchase Order #:	
Credit Card: 🗆 Mastercard 📮 Visa 📮 American Express 📮 Discover	
Name on Card	
Card #: Exp. Date:	

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

Signature:

STMA in action

Goertz at Texas A&M sells Kyle Field turf



▲ At left is Leo Goertz, Texas A&M's athletic fields maintenance manager, being interviewed about selling the old turf from Kyle Field.



▲ Above Left: Venerable Kyle Field is being enlarged to accommodate more than 102,000 "12th men" on football Saturdays. The renovation plans include dropping the playing surface 8 feet and pushing it south 16 feet to add more seats. Above Right: Goertz & Company decided on 110 pallets at \$400 each plus 1,000 blocks at \$20 apiece, all the while wondering how much demand there really might be.



▲ Above Left: Almost hurts to look at the field during renovation process! Above Right: One Aggies fan bought enough turf to surround his house; the white marks are left over hash mark paint.

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@unInotes.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.sc-stma.org.

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

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BY DR. DAVID MINNER

Professor, Iowa State University

Questions?

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Or. send vour auestion to Grady Miller at North Carolina State University, Box 7620, Raleigh, NC 27695-7620, or email grady_miller@ncsu.edu.



Too wet, too dry, too bad?

We have a variety of athletic fields including native soil fields, sand-based fields, and some that have been sand topdressed over native soil for several years. I have started using some wetting agents to help manage dry spots and we are experiencing some benefits. I'm hearing about using them to improve drainage also. How can this be and could you explain how a wetting agent can help when it is too dry and too wet?

Joe Wagner, Iowa City Parks and Recreation

I can usually shoot from the hip on most of my sports turf topics but I'm glad I took the time to research Mr. Wagner's question because newer products have been developed with specific benefits to manage water. The late USGA agronomist Stan Zontek put together a comprehensive review article on wetting agents in 2012 that is really helpful and applies for sports turf managers. In general wetting agents are compounds that help water to spread across or penetrate into the surface of a solid by reducing the surface tension (surfactant) of the water. Soap is a common wetting agent that acts as a surfactant to reduce the surface tension of water allowing it to easily disperse and spread as we wash our hands.

First, ask yourself am I dealing with an anionic or non-anionic wetting agent? Anionic wetting agents have a negative charge and can cause dispersion of clay particles that negatively impacts fine-textured native soils by allowing them to pack tighter. This older type of chemistry was developed in the 1950's and commercially available blends are available as AquaAid, Naiad, Penterra, and Prevade.

Nonionic surfactants can be broken down into two general groups. Those also developed in the 1950's POE-Polyoxyethylene (some examples include E-ZWet, FloThru, Injector, PenMaxx, Surfcide, Wet-Sol, LescoWet), and a newer group of nonionic compounds developed in the 1990's called block co-polymer compounds. The anionic and nonionic products developed in the 1950's were developed to remedy localized dry spot but they were subject to phytotoxicity depending on the application rate and turfgrass species.

Block co-polymer surfactants are the most commonly used class of wetting agents applied today. They are safer to use on fine turf, reduce water repellency of soil and thatch, and have the unique feature of improving soil water content and plant-available water. Two categories exist in block co-polymer technology. Straight block co-polymers that enhance water movement in the soil and can be helpful in leaching programs include: Brilliance, Capacity, Cascade Plus, Conduit 90, Hydro-Wet, LescoFlo Ultra, Remain, and Sixteen90. Reverse block co-polymers enhance moisture retention in chronically dry soils and are sometimes called "retention-type surfactants." Introduced in 1995 they include: Primer Select, Magnus, ReLoad, Rely II, Respond 3, Retain, TriCure AD, and TriCure Micro.

Blends of the "straight and reverse" block co-polymers have been developed to capture the best of both worlds; correct dry spots and enhance water movement. Commercially available products include Aqueduct, Resurge, and ReWet. Turf managers are always trying to field mix wetting agent/soil surfactant products to achieve rewetting, moisture retention, and moving excess water through the soil profile and this is what leads directly to answer Joe's question. Yes, the technology of wetting agents has advanced in such a way that blended or mixed products use similar water tension forces to reduce hydrophobicity (water repelling) and dry spots while at the same time allowing for better water penetration and movement through soils.

Alkyl Polyglucoside surfactants are another category of water managing products that uses a sugar molecule reacted with a fatty acid to reduce water repellency. Their claim to fame targets improved water availability and enhanced irrigation efficiency. Mixed with straight block co-polymers these products are available as Dispatch Injectable and Sprayable, TournamentReady.

Just when you thought it was safe to come out, here is another twist on these designer compounds. By replacing -OH groups with -CH3 it creates thinner films of water that attach to the soil particle in a way that keeps it from completely drying out. The film of water allows for faster rewetting and quick penetration into the ground. Obviously this helps with dry spot, but it also helps by reducing puddles from a brief shower. This modified methyl capped block co-polymer is commercially available as Revolution.

Okay, I don't want to know any more about wetting agents. After researching it I know the newer products won't burn my grass, will allow water to penetrate the soil faster, and may improve turf quality through preventing extremely dry or wet conditions. I'm gonna give it a shot but I will keep in mind that while these rather chic components do help manage water they do not turn a slow draining puddly native soil situation into a rapid draining sand base system; it does not make your drainage go from less than an inch an hour to more than 6 inches per hour. They are not substitutions for proper soil mixtures, drainage, and irrigation systems. Using the right combination of wetting agents/surfactants can help you reduce dry spot, use water more efficiently, and at the same time remove excess water from the surface of a playing field. These are all good reasons to try a wetting agent on fields that are too often too wet or too dry.

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