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On the cover:

Meet the new president of the Sports Turf Managers Association, Allen Johnson, CSFM, fields manager for the Green Bay Packers. Interview begins on page 8.
Photo credit: Matt Becker.

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HEADLINES: SEEN, AND DESIRED

Eric Schroder
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Recently I came across a headline on the internet: "South African man 3D prints a working lawn mower in just 9 hours." Now I'm no engineer, couldn't even play one on TV and I cannot even get my mind around how 3D printers work. What if there's a plastic jam halfway through? Does the mower come out folded like an accordion?

Another headline I have seen online more than once: "Milk more dangerous than cigarettes." And much harder to light I assume. Studies show that eating a high protein diet may result in a greater chance of getting cancer vs. lower protein diets. So your chances to live for 100 years may depend on your skipping bacon cheeseburgers in favor of Greek salads, though if you eat the latter regularly you may prefer death over multiple meals of sodden veggies and olives. Either way, a smoke after your meals isn't recommended.

Remember late last year when the Ebola virus dominated the news? I saw an onscreen headline on CNN: "Ebola: The ISIS of Biological Agents?" How low can the media go in trying to attract an audience? What's next? "Have an itch?—could be Ebola!"?

Has this frightening scenario ever occurred to you? Because it has to me: "Boa constrictor slithers out of clogged toilet." You think I'm making this up, don't you? Not so; this happened in San Diego just last month. I'll be double-checking for months!

Here's one I can never resist: "People of Wal-Mart." There are 11 separate editions of photos of Wal-Mart shoppers from around the country in cyberspace. If ever a warning label was justified, this series is it. Don't view immediately after having a cheeseburger or a salad.

"Two-year-old shoots mother dead." Our all-guns-are-good-all-the-time culture begs to be satirized but it's tough to do when reality takes all the best headlines.

HEADLINES I WISH I WOULD READ

"Kardashian family returns to native Turkey." I've never seen the sex tape, never watched an episode of the TV show, and couldn't pick any of this famous for being embarrassing family members out of a lineup, but their notoriety surely proves that you can never underestimate the American public's interest in talentless fools.

"Congress taken over by patriotic adults." I estimate 20% of American voters think they and their representatives' opinions are right 100% of the time. The rest of us are stuck in the middle while (can I use "talentless fools" again?) politicians do nothing to improve our country. Ask yourself: is my guy (or gal) doing anything for me or is everything they say and do for one overriding goal—reelection? Congress is sponsored by Big Energy, Big Pharma, Big "Farm"-a, Big Insurance, Mr. Billionaire, etc. They aren't putting their names on the buildings yet but your rep and mine are beholden to their cash. Stop blaming the "other side" and realize that money (and gerrymandering) is ruining our political system.

"Spammers decide it's not worth it, get real jobs." Apparently my personal, uh, shortcomings in the manhood department are no longer of interest to the odd folks who spend their days emailing strangers by the millions in hopes of . . . I really don't know what. Now these losers are more concerned with improving my credit rating and telling me about Rachael Ray's workout routine. "Squeeze your garlic! Really squeeze it! Now let's work those fish balls!"

"Champs thank grounds crew." I do not know how often this happens; instinct tells me not much. But then again, dear readers, I do know that recognition, while long overdue, isn't what motivates you to do your best work, 24/7/365. ST

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LIFE IS A COMPETITION

Allen Johnson, CSFM.
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As a parent, one of the messages I try to instill in my son is that "Life is a competition." Almost daily you can witness acts of competition from something as small as jostling for a favorable position in a lunch buffet line (don't pretend that you haven't done that!) to something larger like seeking a promotion at work. All around us, competition lives in our daily lives. From the minute we are born we are competing for something against someone—whether it be with siblings for the attention and approval of our parents, competing for the affectionate eyes of someone you like, or fighting for financial resources. The positive thing about this competition is that it forces us to strive and reach beyond what we would be inclined to do if it didn't exist. Natural law suggests that most of us only do what is necessary. It's why animals in the wild will pick out the weakest one in the herd to attack and while some are happy to dig through civilian garbage rather than go on a hunt.

Within our own industry competition is alive and well. Not only are our athletes competing on the playing surfaces that we maintain, but the surfaces themselves are competing with one another. The professionals who represent a singular type of surface are definitely in competition with each other. Who can blame them? It is a natural consequence. In this spirit of competition, there will be no shortage of outlandish claims for and against each type of surface with the goal of persuading consumers. However in the long term, the truth will always be revealed, and the consumers will ultimately choose what's best for their situation.

Travel back a few decades to playing surfaces of yesteryear, and you will be amazed how those surfaces have improved, both natural grass fields and synthetic surfaces. The very existence of the other forces each group to improve and become better, and we have. Natural grass fields have improved cultivars, improved construction methods, and improved the process of midseason resodding. One only has to step on the synthetic surface of the past to realize the improvement of the new generation.

Many of our members have just returned from our Annual Conference. It is here that we should embrace this competition like professionals. We should be discussing why one surface is better than the other, debating the drawbacks of each, and always asking ourselves how we can improve. We should not shy away from the competition because it forces us as an industry to keep improving. We should also practice our professionalism in these debates.

As the caretakers of these surfaces, sports field managers also must commit themselves to improving their management techniques. I trust that many of you have been rejuvenated by going to Conference and have come back with fresh, new ideas to make you a better sports turf managers. "Life is a competition"; it's no different in our industry and it's a good thing. ST

LEADER OF "THE PACK"

ALLEN JOHNSON, CSFM, WILL BRING TO STMA THE SAME STRONG WORK ETHIC, INTELLIGENCE AND PROFESSIONALISM HE HAS SHOWN AT GREEN BAY'S LAMBEAU FIELD

BY **LYNN GROOMS**

Within a few hours of seeing Allen Johnson literally run between jobs, Steve Hutchison knew the guy was special. Eighteen years later, he feels the same way as Johnson, now fields manager for the Green Bay Packers at Lambeau Field, takes the office of 2015 STMA president. "Allen is quick to grasp the big picture and cuts to the chase. He's hardworking, intelligent and not afraid to get on with the task at hand," Hutchison says.

The two men met in 1997 when Hutchison's company, Tee to Green, had been charged with renovating Lambeau Field. Needing temporary construction workers, Tee to Green had posted a job notice with a

local employment agency. Working for a health insurance company in Green Bay at the time and miserable sitting at a cubicle day after day, Johnson regularly visited a local employment agency over his lunch hour. After reading the posting, "See Steve in the construction trailer in the Lambeau Field parking lot," his life was about to change.

Johnson and Hutchison immediately hit it off, having both served in the military. During the height of the Cold War, Hutchison had been a member of a select team of US Marines charged with protecting Secretary of State John Foster Dulles in Europe. Johnson fought in Iraq during Operation Desert Storm with a US Army artillery unit. "Military service instills discipline to complete a job. Sometimes completing that job is literally a life or death decision," Hutchison says.

ACCUSTOMED TO HARD WORK

Working hard at an early age on his family's dairy farm also helped to build Johnson's character. The Johnsons managed about two dozen milk cows and 50 young stock. They did not have automatic barn cleaning equipment when Allen was a boy. Johnson recalls loading manure on a wheelbarrow, transporting it to a wagon rack and then pulling the rack with a tractor to the fields to shovel it off for the second time. He also remembers working many a windy, snowy sub-zero day on the farm located 2 hours north of Green Bay in Michigan's Upper Peninsula. That experience made him mentally strong. Today when he works long days under adverse conditions at Lambeau's "Frozen Tundra," Johnson says "nothing will be as hard as those early days as a boy."

Johnson joined the Army immediately after graduating from high school. He returned home 4 years later and attended Northern Michigan University (NMU) where he received a Bachelor's degree in Public Administration. Before graduating, he served as an intern at the Government National Mortgage Association (Ginnie Mae) in Washington, DC. After graduating from NMU, however, Johnson had difficulty finding a job in his field. That is when he began working at the insurance company.

Being able to work outside rather than inside a cubicle was one of the reasons that Johnson left his insurance job. The ability to put his knowledge of equipment and his initiative to work were likely other reasons, Hutchison says. "He could quickly grasp what we were doing and start moving on it. There are lots of challenges working with sports turf. It requires someone to fully understand and implement what's needed."

While working at Lambeau Field, Johnson also began working for UPS. "I would wake up at 4:00 am, go to work at UPS and then work at Lambeau," he says. When Tee to Green's renovation of Lambeau was finished, Hutchison asked Johnson if he wanted to stay on and travel with the company to other locations. But, Johnson did not want to leave the area at the time. Fortunately, a position as assistant fields manager for the Packers soon opened up, and Johnson took the job. He worked in this position 2 years before being promoted to fields manager after Todd Edlebeck, his former boss, moved within the Packers organization to become facilities manager.

Soon after his promotion, Johnson enrolled in The Pennsylvania State University's online turfgrass program and earned an advanced certificate in turfgrass management. "It was one of the first online courses of its kind," Johnson says, adding that his soils classes were especially valuable. "In football, there are issues with drainage. These classes helped me get a good grasp of soil characteristics." He used what he had learned in this program to convince Packers management about the value of upgrading Lambeau and its practice fields.

When Johnson first starting working for the Packers, the practice fields had been composed of native soil with a lot of poor-draining clay. The first renovation involved reconstructing the rootzone with a sand base. Then sod was installed. To keep the turf in good playing condition during Green Bay's short growing season, he also recommended the Desso GrassMaster system which involved injecting artificial fibers into the natural turf. The knitting together of the artificial fibers and the natural grass helps stabilize the root zone, Johnson says.

Johnson eventually got management's go-ahead to remodel Lambeau and an outdoor synthetic practice field. The players said their legs were more stressed and fatigued playing on the other practice field's artificial turf and that they did not like changing from one playing surface to another.

Asked about his greatest accomplishments, Johnson says, "Being a dad. I have a great son." Ethan, 11, does not play football, but his dad points out that he is an excellent swimmer and excels in academics.

"He could quickly grasp what we were doing and start moving on it. There are lots of challenges working with sports turf. It requires someone to fully understand and implement what's needed."
— *Steve Hutchison*

DEMONSTRATING VALUE

Johnson also is proud of the renovation at Lambeau under his direction because it involved communicating his knowledge of field management and its impact on players so that management

could make an educated choice. "It matters to me how our employers view us and our value to their organizations," says Johnson, adding that one of STMA's goals has been to raise the level of professionalism of the sports turf industry. "Our association can't go into your place of employment and make management respect you. *You* need to demonstrate your value. But, STMA can give members the tools they need," he says. These tools include continuing education programs on how to be better managers, how to communicate scientific principles to executives and so on.

Johnson believes that STMA also took a big step forward when it hired a marketing communications firm to help increase general awareness about the value of the sports turf industry to target audiences, such as school boards, athletic directors, facility management groups, parent-teacher organizations.

"As the sports field manager for the Green Bay Packers—a marketing and promotional machine—Allen brings his expertise from that franchise to STMA's public relations efforts," says Kim Heck, CEO of STMA. "I look to Allen to bring his great board skills to the presidency. He is always well-prepared for every board meeting and his style is insightful. He listens very well, but is not afraid to voice his opinions and respectfully disagree. This is what makes the STMA Board so energizing to work with, the vibrant discussions and the board coming to consensus on what is best for the association."

David Pinsonneault served as STMA president in 2014 and will continue to serve on the board as immediate past president. He agrees that Johnson is straightforward. "You don't have to guess what he's thinking." Pinsonneault's advice to the new president is to engage the STMA membership. "We're fortunate to have very active members and we need to keep them involved with different committees and task groups. Fortunately, Allen has great resources and a hardworking staff available to him."

That staff includes Heck and her team at STMA headquarters as well as Johnson's three full-time assistants (Derek Paris, Bart Bartelme and Joel Hunt) in Green Bay. Paris has worked with his boss for almost all of Johnson's tenure with the Packers. Asked about Johnson's leadership style, Paris says, "Allen is very particular in everything he does at work or in his personal life. He is hands-on and puts 100 percent effort into everything he does. As far as motivating, it's hard for me to say. I feel that we, as his assistants, are self-motivated. Working for a prestigious organization like the Packers is all the motivation one needs to do a top-notch job at all times. Allen leads with this same belief."

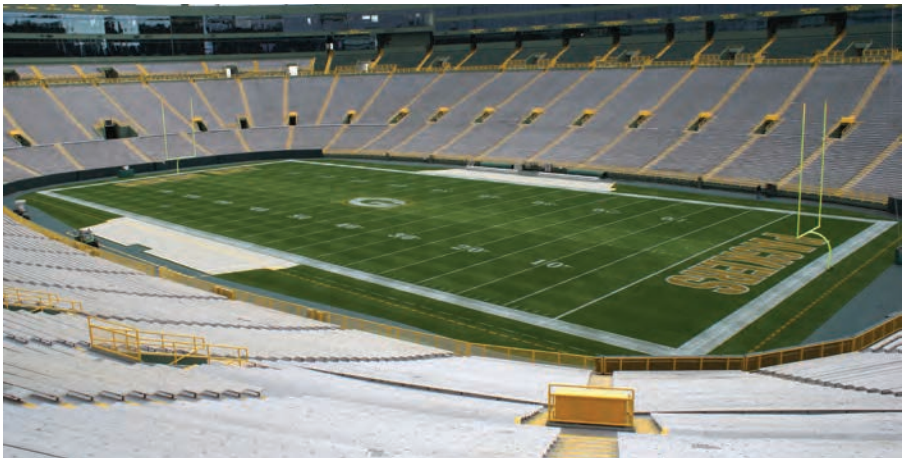
Johnson can poke fun at himself. Asked what factors go into some of his field management decisions, he says, "It's probably more my 'very particular personality' than my job experience. I'm a bit OCD when it comes to the field."

You can also get a sense of his humor watching the Coca-Cola commercial in which Johnson appeared during last year's Super Bowl (https://www.youtube.com/watch?v=1eyj1qKksPs). Most people would brag about being featured in a national commercial like this, but Johnson was modest, never mentioning it to his peers, Pinsonneault says. During the interview for this article, Johnson also did not mention that the STMA named Lambeau Field its Field of the Year in 2009.

SERVICE TO STMA

Johnson's work on various STMA committees has helped him to get more acquainted with fellow members, and to learn more about the association and what it is trying to accomplish. He has chaired the Awards Committee as well as served on the Scholarship and Membership Committees. He also has served as both secretary-treasurer and chair of the Finance and Audit Committee. The latter, says STMA's Heck, has provided Johnson "a comprehensive understanding of the association's budget, its revenue streams and potentials. This helps in evaluating new programs and services that need funding."

As president, Johnson would like to see STMA become more visible with the end user groups he mentioned earlier in this article: school boards, athletic directors, facility management groups and parent-teacher organizations. As outlined in his vision for STMA at www.stma.org, he also hopes the association will "make further strides in helping its members enhance their professional image. Our success depends upon being avid learners, building relationships within our organizations, and being able to communicate and influence these decision-makers. STMA can help us by providing the continuing education and resources to gain respect and succeed in our careers." ST



Lynn Grooms, Grooms Communications, is a Wisconsin-based freelance writer and a Green Bay Packers fan.

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Crabgrass infestation on a sports field.

THE PREEMERGENCE/ HERBICIDE DILEMMA

BY **DR. JOHN R. STREET, PAMELA J. SHERRATT, AND DR. DAVID S. GARDNER**

The basic concept of weed control in turfgrass ecosystems will really never change. The paramount principle against the establishment of weeds in any turfgrass system is the culture and maintenance of a healthy, dense, competitive stand of turf. A preventative cultural approach is successful only on sports fields if proper fertilization, mowing, irrigation, pest control, core cultivation, overseeding, etc. practices are implemented in an integrated management program. Unfortunately, on sports fields an additional challenge to maintaining a dense stand of turfgrass is foot traffic (in many cases severe) that creates the additional stress of both direct physical wear and tearing/shearing/divoting that weakens the turfgrass and opens up the surface to an increasing opportunity for weed encroachment and for the germination of annual grassy weeds. Basically, annual grassy weed control in any turfgrass system is what I refer to as the "science of voidology" and "ecological niches." Weed seed present in the soil is lying dormant just waiting for an opportunity under the right environmental and cultural conditions to invade a weakened turf with open voids. Annual grassy weeds like crabgrass prefer these voidology and ecological niche conditions. Weed encroachment on sports fields is much more likely due to "voidology conditions" and more so than any other turfgrass management system.

Sports turf managers therefore require the ultimate expertise in the art and science of turf management as the odds in many cases are against you.

Although there are many potential problematic weeds that can invade athletic fields certainly the most common annual grassy weed across the country is crabgrass as it observes no boundaries. It is a C4 turfgrass in the same physiological class as the warm-season grasses and thus thrives under moist and warm/hot environmental conditions (ecological niche). Give crabgrass an opening/opportunity under the appropriate conditions and it germinates and infests turf quickly with tillering occurring within weeks of germination.

Table 1. Soil temperatures for annual grass germination.

	Critical soil temperature*		
Weed	°F	°C	Scientific Name
Large and smooth crabgrass	50 - 55	10 - 13	*Digitaria sanguinalis and ischaemum*
Goosegrass	60 - 65	15 - 18	*Eleusin indica*
Barnyardgrass	60 - 65	15 - 18	*Echinochloa crusgalli*
Foxtails	65	18	*Setaria spp*
Annual bluegrass	45	8	*Poa annua*

* Watschke, T.L. 1995. Turfgrass weeds and their management. In *Managing Turfgrass Pests.*

In our opinion the key predictive criteria for crabgrass germination and infestation is soil temperature. Other predictive methods can be used to determine crabgrass germination like growing degree days (GDDs), phenological events like forsythia bloom drop, calendar dates, weather consultant services, historical experience, etc. but soil temperature monitoring is by far the most reliable qualitative method. Crabgrass typically initially germinates in late winter/early spring when nighttime soil temperatures reach 50-55F for several consecutive nights (Table 1). It continues to germinate throughout the spring and early to mid summer period.

Monitoring soil temperatures at a 2" depth is one of the best ways to predict when crabgrass will initially germinate. The temperatures listed in Table 1 refer to the low nighttime soil temperatures over a period of several consecutive nights. Any method that assists in monitoring soil temperature within your region can be used like a simple soil thermometer or a website weather database; a weather monitoring technology like the Spectrum Technology Watch Dog weather system also can provide a wide variety of other climatological data in addition to soil temperature, local weather consultants, etc. Our Ohio Agricultural Research and Development Center at the Ohio State monitors climatological data at 20 different locations across the state and provides weather data via the OARDC weather system web-site every 5 minutes 24 hours a day 7 days a week. Sports field managers can log onto the site anytime and retrieve past and current nighttime soil temperatures at the 2" and 4" depths every night and day during the late winter/spring. As soil temperatures begin to move into the 50-55F range for several consecutive nights, just like a clock, crabgrass will initiate germination. The OARDC weather system is a great soil temperature monitoring tool. Check with your closest land grant university or state turfgrass specialists to see if such a weather-based system is available to you in your state. The second best attribute of this system is that it is FREE. I think most of us like valuable things that are free.

The relatively new GDD tracker program/model (www.GDDTracker.net) developed at Michigan State University is another good way to assist you in monitoring crabgrass germination timing based on growing degree days. It is set up for monitoring in four mid west states at the present time. In Ohio, GDD tracker program use is being financially sponsored by John Deere Landscapes and the Ohio Turfgrass Foundation. You may want to consider working with sponsoring agencies, associations and foundations in your state to bring this program on board.

Most turfgrass managers continue to rely on the use of preemergence herbicides as a standard preventative control for crabgrass and other annual grasses (an "offensive" strategy). Preemergence herbicides provide a chemical barrier or blanket at the soil surface intercepting the young seedling weed and preventing it from emerging/developing (Figure 1). Thus, proper application timing is a key factor in its effectiveness. Many agronomists consider improper (i.e. missing

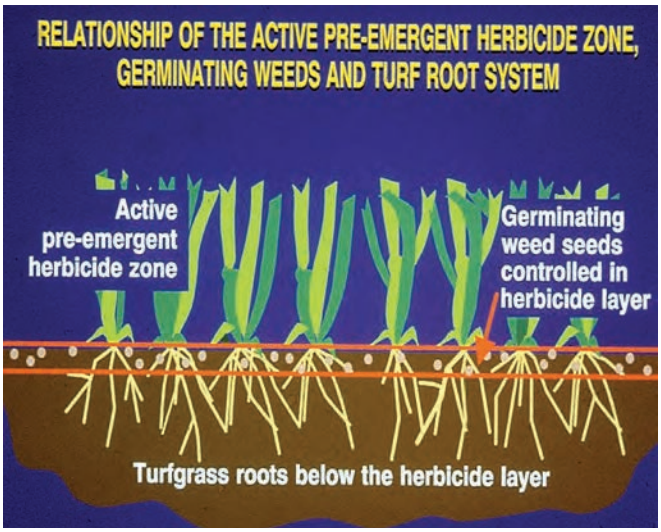

Figure 1: Preemergence herbicides form a chemical barrier or blanket at the soil surface. New annual grassy weed seedlings like crabgrass contact and absorb the herbicide during emergence and are killed. See table for restrictions on seeding and overseeding with preemergence.

the initial window of crabgrass germination) as the primary reason for preemergence herbicide failure. Emerged crabgrass plants are not controlled by preemergence herbicides, except for Dimension, which exhibits early post and pre activity. The basic "offensive" principle is that the preemergence herbicide be applied before the onset of crabgrass seed germination. It is fairly simple if you engage the "offensive" principle and monitor soil temperatures and/or GDDs. Crabgrass can germinate at significantly different times from year to year. In Columbus (a great example) crabgrass germinated at its typical time of April 20-25 in 2013, but in 2012 crabgrass surprised most turf managers by germinating March 15-20 (4 weeks earlier than normal). Sports turf managers monitoring for soil temperatures and/or GDDs where well ahead on the "offensive" side of the game plan whereas many other managers lost the game in the first quarter (March/April 2012). Really can't recover when the initial germination window has long passed (like a wide receiver 30 yards down the field and wide open!).

Preemergence herbicides that can be routinely used in the "offensive" plan of most turfgrass managers for both cool and warm season grasses are listed in. The most effective preemergence herbicides are those ranked good (G) to excellent (E) for crabgrass control. The "offensive" strategy for sports turf managers is confounded by the fact that most of these preemergence herbicides will severally damage, kill and/or prevent the emergence of desirable turfgrasses as well as weeds. Sports turf managers have several choices of preemergence herbicides based on species tolerance and efficacy where NO seeding or overseeding programs are planned. Most of the herbicides listed for standard preemergence use cannot be used on turfgrass areas at the time of seeding or within a certain time interval after a preemergence application.

Please note that there are major differences in the tolerance/

safety of these herbicides between cool- and warm-season grasses. Pay particular attention to the herbicide label regarding use on more sensitive species like the fine fescues and hybrid bermudagrasses, as well. Never use a preemergence or postemergence herbicide for crabgrass or other annual grassy weed control before fully reading and understanding the use requirements and restrictions on the label. A good example would be Dimension (dithiopyr) that cannot be safely applied at the time of seeding or until the desirable turfgrass has been mowed at least 2-3 times. Also, there is a suggested waiting period or time interval after a Dimension application of 6 to 16 weeks before seeding/overseeding depending on application rate.

Thus the standard "offensive" strategy becomes a problem in attempting to control crabgrass and other weed species during turfgrass establishment in seeding or overseeding operations. One approach is "site specific" management by only applying a preemergence herbicide on sports field areas that DO NOT require seeding or overseeding like outside the hash marks, beyond the 20 or 30 yard lines, end zone areas, and side line areas on football fields.

Where seeding or overseeding is necessary, there are a few options. Herbicide options that are considered to be safe for use at the time of seeding or at 4 weeks after seedling emergence are listed in. The list is restricted to only a few but includes siduron (Tupersan), mesotrione (Tenacity) and Pylex (topramazone). Follow the label carefully. When used properly, siduron will reduce crabgrass, goosegrass, foxtail and many summer annual broadleaf weeds by 70-80%. Mesotrione (Tenacity) and Pylex (topramezone) are excellent preemergence tools to use in seedings for reducing spring/summer weed pressure from crabgrass, goosegrass, sedges, and summer annual broadleaf weeds by 90% or greater. These two latter products allow sports turf managers to be more successful with spring and summer seedings by effectively reducing weed competition and actually "widening the window" for successful seeding/overseeding into the summer.

Both Tenacity and Pylex are in the same chemical family and inhibit carotenoid biosynthesis with chlorophyll destruction resulting in all susceptible weeds turning white (bleaching symptom). These two herbicides have both pre- and postemergence activity on crabgrass and many other weeds. Preemergence residual with both these herbicides, however, lasts only about 30 days and, therefore, will not provide season-long preemergence activity. Where longer preemergence activity/residual is required, like in early spring or early summer seedings/overseedings, a sequential or follow-up application can be made at a 30-day interval or at least 4 weeks after seedling emergence. Where perennial ryegrass is a principle component of the sports field turf, it is NOT suggested that the interval on repeat applications be shortened to less than 30 days. Reducing crabgrass and other annual weed competition during seeding operations with these latter two herbicides should greatly enhance your success at spring and summer seedings/overseedings. They are a definite benefit in establishment programs should be included in every sports turf manager's weed control tool box.

DEFENSIVE STRATEGIES

Postemergence herbicide options or "defensive" strategies for controlling crabgrass in established turfgrasses include Acclaim Extra (fenoxaprop p-ethyl), a number of quinclorac (Drive DF) products and XLR8, Tenacity (mesotrione), Pylex (topramezone) and a few combination pre/post products including Calvalcade PQ (combo of prodiamine plus quinclorac), Echelon (combo of sulfentrazone plus prodiamine), and Dimension (dithiopyr). Dimension has early postemergence activity on crabgrass so young (3-5 leaf and before tillering) crabgrass is controlled and a preemergence barrier is set in place for the remainder of the season. This is a great herbicide tool in the spring where crabgrass germination has occurred before the application of a preemergence herbicide. A similar "defensive" strategy is the basis for the combination products Calvalcade PQ and Echelon where the quinclorac or sulfentrazone provides post activity on already germinated crabgrass and the prodiamine provides a preemergence barrier for the remainder of the season.

Drive DF products and XLR8 are good "defensive" options where crabgrass has matured beyond the early post crabgrass stage (tillered). It is a foliar absorbed post herbicide that requires a surfactant and needs to be applied at no less than 0.75 lbs. ai/A for best results. XLR8 would be an excellent choice for sports turf managers in late summer where a rescue treatment for quick crabgrass knockdown is required before the beginning of the playing season (a "defensive" save face strategy). XLR8 will discolor and reduce the visibility of crabgrass in the canopy within 3-5 days in conjunction with a good fertility program.

Finally, both Tenacity and Pylex have been evaluated for postemergence crabgrass control in Ohio State research over the past several years. Both again are so called "bleacher" herbicides. Two sequential applications of both herbicides will effectively control mature crabgrass on a consistent basis. The addition of triclopyr with Tenacity (8 oz product/A) increases the efficacy of Tenacity to where a single application of the combo provides good to excellent post crabgrass control. Pylex alone has shown good to excellent postemergence activity on tillered crabgrass in a single application. The inclusion of triclopyr with Pylex also enhances its activity on tillered crabgrass and many other weeds. Pylex is a stellar product for goosegrass control. The inclusion of triclopyr in combos with Tenacity or Pylex also eliminates the bleaching or whitening symptom. ST

Dr. John R. Street is an extension/research associate professor; Dr. David Gardner is a research/teaching associate professor; and Pamela Sherratt is a senior extension sports turf specialist, all with the Department of Horticulture and Crop Science at The Ohio State University, Columbus.

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FOUR CONSIDERATIONS FOR PRE HERBICIDE USE IN 2015

BY **DR. JIM BROSNAN AND GREG BREEDEN**

Every year many turf managers make preemergence (PRE) herbicides an integral part of weed management programs. By in large, PRE herbicides are used to control summer annual weeds such as crabgrass, goosegrass in addition to small-seeded broadleaf weeds. Numerous options are available for use in warm- and cool-season turf at variable price points. Regardless of product selected, turf managers should consider four things to improve efficacy of PRE herbicide programs in 2015.

CHECK FOR POTENTIAL WINTER INJURY

Many turfgrass managers lost areas of warm or cool-season turfgrasses following the extreme winter conditions of 2013-2014. Losses occurred from winter desiccation, exposure to lethal temperatures, or a combination thereof. Characteristics of affected sites included: turf with shallow root systems; turf subjected to winter traffic; turf in areas of heavy shade (particularly during morning hours); as well as poorly drained areas of turf.

In many cases the extent of winter damage was not fully apparent until early summer, several weeks after PRE herbicides are commonly applied. This was problematic in that many PRE herbicides have soil residual activity that can compromise rooting from stolon growth or prevent establishment of new seed altogether. It is highly recommended that turf managers check sites for potential winter injury before applying a PRE herbicide in 2015. The basic process of evaluating potential winter injury is simple: remove a core of turf from the field, place it in a south facing window, and keep it watered. If new leaf growth initiates, that is a sign that winter conditions have not harmed the turf and PRE herbicides can be used. If no new leaf growth forms, that should be a signal that winter conditions may have harmed the turf to the extent that re-establishment could be required; thus, PRE herbicide use in these areas should be avoided (see photo).

EXPLORE LABELS

Many think of PRE herbicides as tools only used for grassy weed control. Exploring product labels will reveal that many PRE herbicides are labeled for control of dozens of small seeded broadleaf weeds, as well as sedge and kyllinga species. For example, dithiopyr (e.g., Dimension) and pendimethalin (e.g., Pendulum AquaCap) labels claim control of more than 25 different broadleaf weed species. Moreover, prodiamine + sulfentrazone (e.g., Echelon) and pendimethalin + dimethenamid (e.g., FreeHand) labels claim PRE control of numerous broadleaf weeds as well as yellow nutsedge and green kyllinga. To maximize the efficacy of PRE herbicide programs in 2015, turf managers can review the diversity of weeds across their fields and select a product that helps manage as many weeds as possible.

MANAGE TURF TO REDUCE WEED PRESSURE

Another step that can be implemented to improve the efficacy of PRE herbicide programs in 2015 is to manage turf with an eye on reducing weed pressure during the summer season. Annual weeds such

Research has shown that increases in mowing height as small as **1/64 of an inch** can increase photosynthesis as much as **13%**

as crabgrass germinate from seed present in the uppermost layers of soil. Like all plants, these seeds require sunlight for germination. Practices to maximize turf cover during the season will minimize the amount of sunlight reaching the soil surface ultimately lowering crabgrass pressure.

Practices to maximize turf cover include everything from the selection of traffic tolerant cultivars, management of summer diseases that can reduce turf cover, to changes as simple as increasing mowing height. Recent research has shown that increasing turf mowing height during the summer can improve the efficacy of several PRE herbicides including dithiopyr, oxadiazon (e.g., Ronstar), pendimethalin, prodiamine (e.g., Barricade), and prodiamine + sulfentrazone. Increasing mowing height will also improve the ability of turf to compete against weeds for essential water, nutrient, and light resources. Research has shown that increases in mowing height as small as 1/64 of an inch can increase photosynthesis as much as 13%. Thus, increasing mowing height not only improves PRE herbicide efficacy but also helps turf produce carbohydrates needed for growth and vigor during fall sports.

ACKNOWLEDGE THAT RESISTANCE IS REAL

Perhaps the biggest step field managers can take in maximizing PRE herbicide efficacy in 2015 is to acknowledge that herbicide resistance, particularly to PRE chemistry, is a very real phenomenon that can compromise weed management programs. Biotypes of annual bluegrass and goosegrass with resistance to commonly used PRE herbicides are being identified, with increasing frequency, throughout the transition zone southward. In most cases, these biotypes have evolved following repeated use of the same PRE herbicides over consecutive years without rotation to different herbicides that make use of variable mechanisms of action to control weeds. Many mistakenly assume that herbicides with different trade or active ingredient names work differently—*this is not the case.* For example, prodiamine, dithiopyr, and pendimethalin all control weeds in the same manner (inhibiting cell division). Therefore, if resistance evolves following exclusive use of one of these products then weeds will be resistant to the others as well.

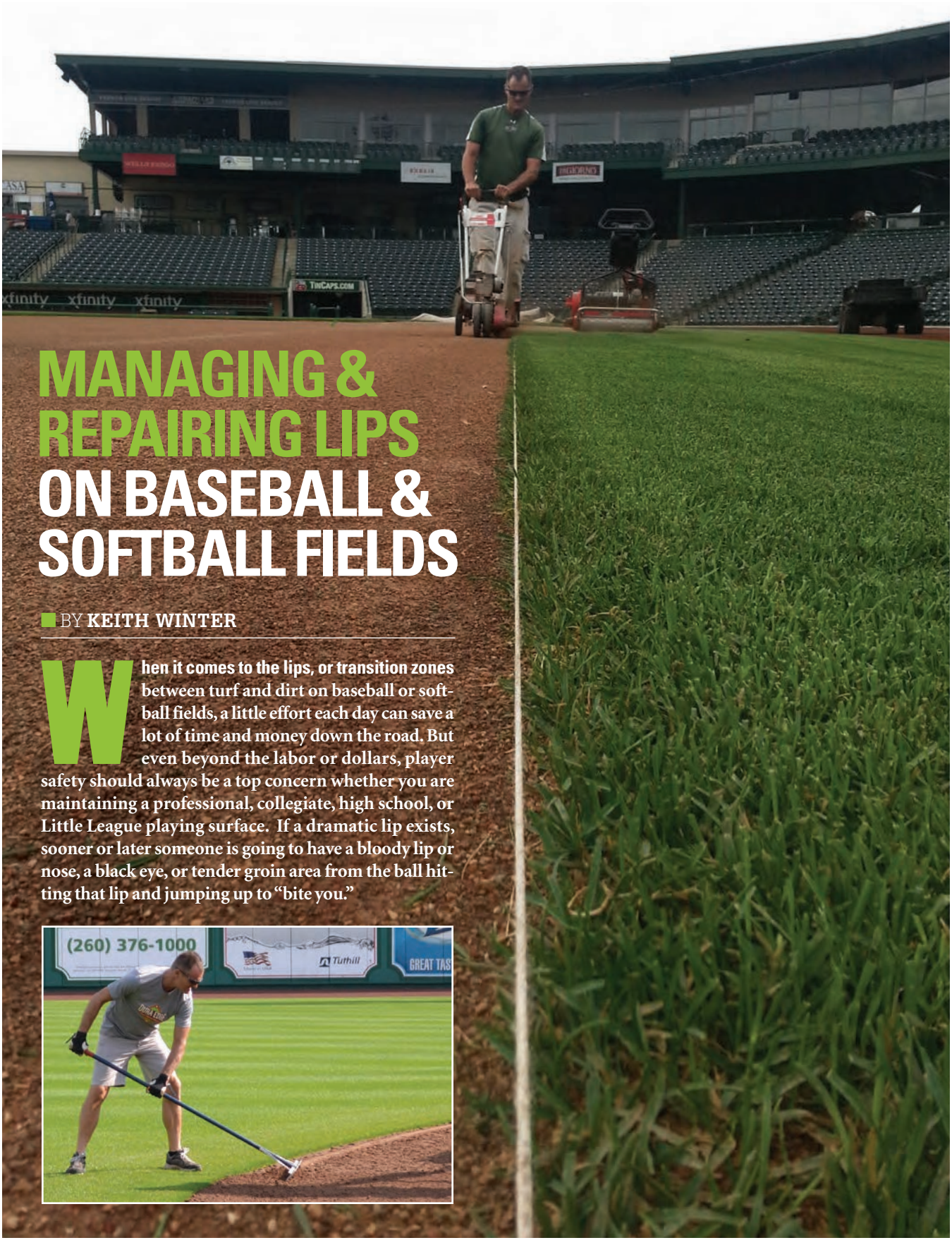
Failure to rotate herbicides with different mechanisms of action or implement diverse weed management strategies (other than spraying) can lead to severe consequences should herbicide resistance manifest. Case studies of facilities suffering from herbicide resistance have shown that the cost of weed control can increase three-fold once resistance is apparent. For example, the cost of annual weed management at a facility with resistance to dinitroaniline herbicides (e.g., prodiamine, pendimethalin, etc.) was $143 per acre compared to ~$50 per acre before resistance reached a critical level. In addition to economics, resistance can drastically reduce the number of herbicide options available for effective weed management regardless of price. This is concerning given that no new herbicidal mechanisms of action have been introduced into the agricultural marketplace since the late 1980s. Fewer tools available for weed

Biotypes of annual bluegrass and goose-grass with resistance to commonly used PRE herbicides are being identified, with increasing frequency...

management coupled with an increased implementation cost is troubling considering that the presence of weeds on athletic fields can directly compromise athlete safety.

PRE herbicides can be a highly effective tool for managing 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's Institute of Agriculture. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science website at www.tennesseeturfgrassweeds.org. ST

Dr. Jim Brosnan is the head of the turfgrass weed science research and extension program at the University of Tennessee. Greg Breeden is a weed science extension assistant at the University of Tennessee.



MANAGING & REPAIRING LIPS ON BASEBALL & SOFTBALL FIELDS

BY KEITH WINTER

When it comes to the lips, or transition zones between turf and dirt on baseball or softball fields, a little effort each day can save a lot of time and money down the road. But even beyond the labor or dollars, player safety should always be a top concern whether you are maintaining a professional, collegiate, high school, or Little League playing surface. If a dramatic lip exists, sooner or later someone is going to have a bloody lip or nose, a black eye, or tender groin area from the ball hitting that lip and jumping up to "bite you."

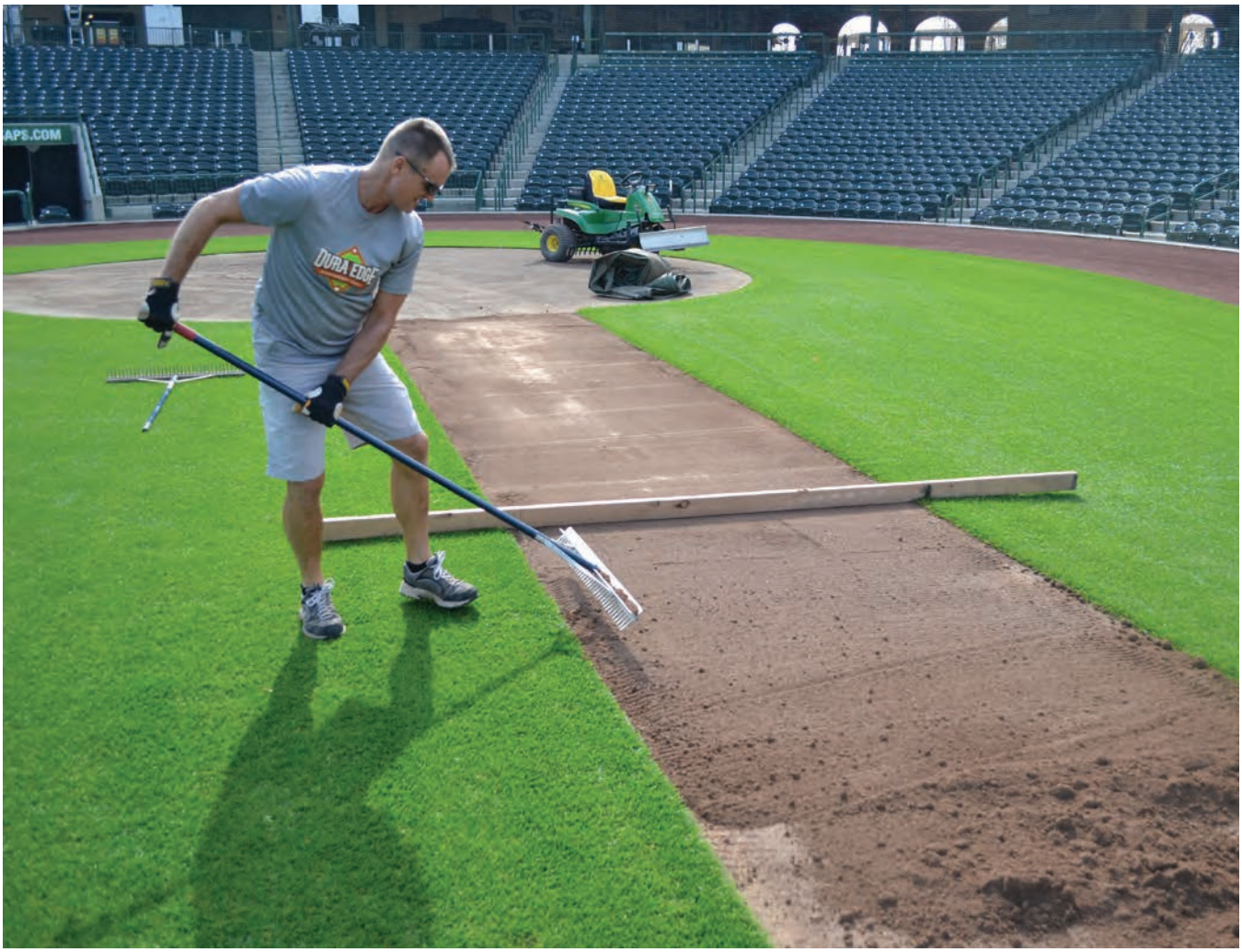
How do you know if your lip is unsafe? First of all, it's pretty obvious to the naked eye if you have a raised area at any turf/dirt transition area. There will be a "hump." If you can't see it, you can always feel it. Put your foot half on the dirt, half on the turf. If your foot is level, life is grand! If you feel the bump, you have work to do. At the higher levels of infield maintenance, watching batting practice tells a lot. As ground balls travel through the infield, is the ball staying down? If it "jumps up" every time it moves from grass to dirt or vice versa, again, it's time to go to work.

If you can't see it, you can always feel it. Put your foot half on the dirt, half on the turf. If your foot is level, life is grand! If you feel the bump, you have work to do.

The best place to start is at the start. In the off-season, determine where your area of concern is. If the turf is high and your infield mix low, strip off your infield conditioner or topdressing and raise your dirt. Adding material in bulk and laser grading the entire skin is suggested, but if you don't have the budget, "cheat" by adding some material along your edges. Bring in a roller and with half of the drum on the dirt and the other half in the turf, smooth and compact that edge until it is flush. We roll again in the spring after our winter freeze and thaw before we put the conditioner back on to make sure we have "baby's bottom" edges going into the season.

If the transition zone of your turf area is raised from the ongoing battle with your infield material moving into your edge (from wind or water erosion or dragging too close to the edge) taking out that "bump" requires more time, effort, and the proper equipment. Unless you want to extend your inside or outside edge by simply cutting back the sod and grading away the excess dirt, using a sod cutter to strip the turf is suggested. Once the turf is pulled back, you can remove that compacted soil (again with your sod cutter or grading blade), and bring that elevated area back to flush. Replacing the same stripped sod, laying new sod, or seeding the area, will get that "bump" out of your way.

Now that you have done the work to have a flush edge, MORE work will keep



it that way. These are the methods we use at the professional level to maintain all our turf to dirt transition areas:

Blow out loose conditioner or soil daily with a gas-powered blower. Move that loose material AWAY from the edge. One of our grounds crew does this on every edge after every game. When he is finished, there is a foot of "naked" infield mix exposed without conditioner.

Periodically sweep all edges with a stiff-bristled push broom. We do this at least once a week or after tarp pulls to get that conditioner back where it belongs. I call it "bump and push" as you bounce that broom over the turf to loosen the material and move it away from the edge.

Power wash the edges with pressurized water. We do this at least once or twice each season depending on the status of our build up. Instead of high volume, high pressure (1-inch hose), we go with a ¾-inch garden hose and easy controllable nozzle that can pinpoint

where the water is going. High pressure, high volume water can get too deep into the crown of your turf plant and take a long time to recover. Our goal is to get the conditioner OUT of the turf, not to blow it up!

Edge, edge, edge! I don't think you can edge too much. A gas-powered, belt driven, single blade edger is a relatively cheap investment. Change the blades often to give you the best and longest cutting surface. We string and edge all our warning track and infield edges before the start of every home stand, and often again when another team comes into town during that same home stand. That clean, edged look gets everyone's attention. I've taken care of youth league and high school fields where all I did was edge, and people commented on how much better the field looked! Edging also helps you maintain that "transition zone" so you have a crisp and specific line to work with. If your edge is not distinct, the lip WILL build up in a relatively short period of time.

Drag and rake carefully! When dragging with any kind of pull-behind drag, stay a foot away from the edge. Loose soil and conditioner moves very quickly, especially when it is dry. When hand raking, develop a "touch" to bring your conditioner right to the edge, not over it or into the turf. We keep our edges "naked" until pre-game, so none of that conditioner is moving around during batting practice or infield. During pre-game work, we carefully cover the "transition zone" without piling it up.

Edging also helps you maintain that "transition zone" so you have a crisp and specific line to work with. If your edge is not distinct, the lip WILL build up in a relatively short period of time.

These are some of the methods we use at the professional level. Depending on the amount of crew and time spent maintaining a high school or amateur field, you may not be able to devote this much attention to your edges or lips. However, a little work can go a long way in the prevention of material build up in your lips, which enhances player safety, as well as the overall aesthetic appeal of your field. Not only do clean edges catch the eye of spectators, but player s at any level appreciate when they are not constantly on the lookout for the "bad hop." Every little league coach tells youngsters to "keep your head down" when fielding a ground ball. As a groundskeeper (paid or volunteer), our efforts can go a long way in giving athletes the best chance to succeed. ST

Keith Winter is the head groundskeeper at Parkview Field for the Fort Wayne TinCaps.

TOPDRESSING SPORTS FIELDS

BY **DR. ANDREW MCNITT**

There seems to be some confusion in the industry regarding the proper topdressing practices for sports fields. The confusion stems from taking a management practice designed for a high-sand soil and applying it to native silty soils or vice versa.

Let's review. If you have a soil that is high in silt and clay, you should be managing the soil to improve soil structure. Structure is the aggregation or binding of soil particles together to form larger particles (Figure 1). These larger particles can then stack against each other, almost like sand, and gaps or air spaces (pores) are formed between the particles.

Figure 1. Soil structure is the aggregation or sticking together of smaller particles to form larger particles.

So when you are managing for increased soil structure, you are trying to create/increase soil particle aggregation. The way you do that is to add glue and stir.

Organic matter is the glue that binds soil particles together. Thus if you are adding high quality organic matter to your soil, you are adding the glue and working to create stronger aggregates that in turn provide air to the root system. In a previous article I discussed how to select a quality compost to use as topdressing just before aeration. That information can be found at http://plantscience.psu.edu/research/centers/turf/extension/factsheets/composts and composts can be tested for quality at www.aasl.psu.edu.

I keep running across high schools that are topdressing with a combination of sand and compost. I don't understand why. Adding a small amount of sand to a soil high in silt and clay (most soils in Pennsylvania) will not help with soil structure. In fact it can hurt. Sand does not aggregate to an appreciable degree and just takes up space until you add so much sand that you make the soil into a loamy sand.

Let's look at the textural triangle (Figure 2). If your soil is a silt loam soil,

you probably have between 20 and 30 percent sand in there now, maybe less. What happens if you add just a little bit of sand and move the percent sand from say 22 to 25%? If you were trying to amend the top 3 inches that would translate into about 30 tons of straight sand per acre. You've now moved your soil texture from Point A in Figure 2 to Point B

Do you think this helps? The answer is no and it may even hurt, here's why. Look at Figure 3. Imagine that the rectangle represents a soup can filled with flour. There have been some holes poked in the bottom to allow water to drain. Imagine that the marbles aren't there yet. Let's percolate the flour in the soup can. It has some percolation rate, I don't know what it is but it percolates at some rate. Now let's add those marbles. After we added the marbles, did the percolation rate go up or go down?

Think about it for a second.

If you said no change, you are, for all practical purposes correct. Likely we wouldn't be able to measure much change, but if we could, we would find that the percolation rate would go down. The reason is that before water would move through the areas where the marbles were, now the water much move around those areas.

As you add more and more marbles the percolation rate keeps going down until you have enough marbles, so that they are all touching each other, and there isn't quite enough flour to fill in all the gaps. At that point the percolation rate, and thus macroporosity, increases. The textbooks tell us that this happens at around 60% sand and I believe if you have the perfect sand and only the perfect sand, then this may be true. My experience is that it typically happens around 75% sand. If a 3% increase equals 30 tons per acre, what does a 50% increase mean? It means 500 ton per acre to amend the top 3 inches. And this is the minimum that is likely to be required.

So if you are topdressing a native soil field, use straight compost. Could you cut that compost with a little bit of topsoil? I guess, but why? You have all the sand silt and clay you need, all you need for good quality topsoil is the addition of organic matter. Remember, adding a little bit of sand is sometimes worse than adding no sand at all. Bricks have a lot of sand in them. Typically they are about 60% sand.

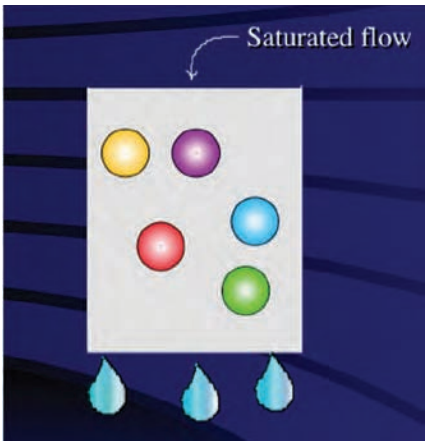


Figure 3. Saturated flow through a soup can filled with flour. The colored round objects represent marbles.

Now if you have a native soil field and want to change to managing a sand field or at least a sand cap field that is a different story. Now you want to follow what the golf courses typically do to their push-up greens, that is, build a layer of almost pure sand on the surface. You're not mixing in the sand; you are layering it on the surface (Figure 4).

Figure 4. Sand Cap.

Here is a really good guide on one method to accomplish building a 'push-up' sports field, or as it is typically referred to: a sand cap system. http://turf.msu.edu/assets/ArticlePDFs/Built-Up-Sand-Capped-System.pdf

Several words of caution: For a sand

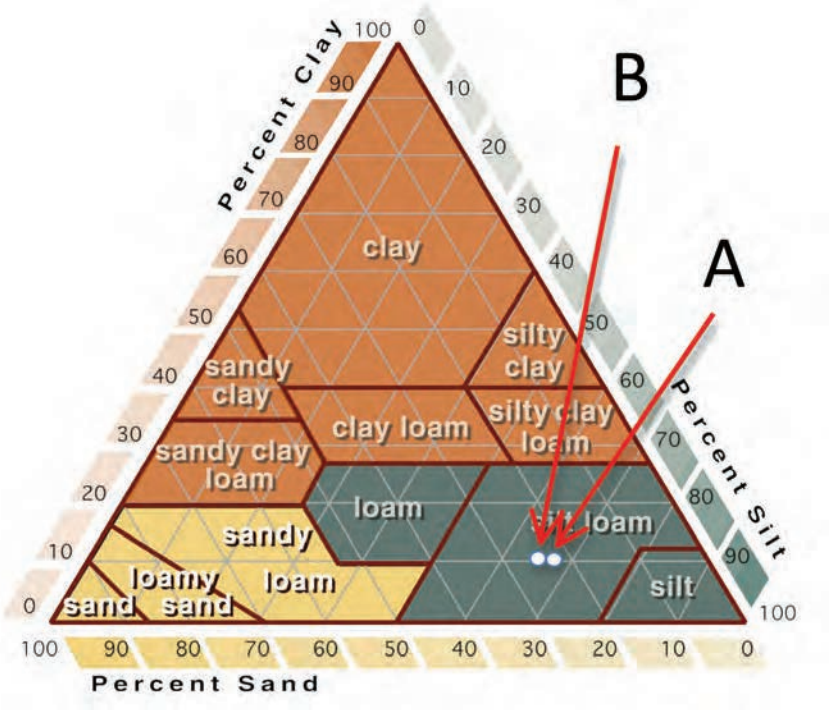


Figure 2. Textural triangle; points A and B are both silt loam soil with point B having 3% more sand than Point A.

If you've never managed sand, it is sometimes less forgiving than soil in that there is less room for error managing water, fertilizer, topdressing etc.

cap system to work well you'll need a couple things. 1. A good in-ground irrigation system. 2. A core harvester, because every time you aerate you MUST pick up the cores. If you don't, you'll be mixing the sand and soil and you'll be back to making bricks and sealing off the sand surface. Also, you should plan on topdressing with sand regularly.

Something else to consider: Turf growing on sand cap systems doesn't wear better under moderate soil moisture conditions; however, the sand cap will help prevent that Friday night mud bowl that can ruin a field. It will help prevent damage from use during wet soil conditions.

If you've never managed sand, it is sometimes less forgiving than soil in that there is less room for error managing water, fertilizer, topdressing etc. It takes a higher level of care but can offer a very nearly all-weather playing surface. ST

Dr. Andrew McNitt is Director of Penn State's Center for Sports Surface Research (ssrc.psu.edu) and also the Program Coordinator for the 4-year turfgrass science major and the Basic & Advanced Certificate as well as the Associate, Bachelors, and Masters of Professional Studies Programs offered through Penn State's World Campus Online Learning. Dr. McNitt is currently the technical adviser to the NFL Groundskeepers Organization.

John Mascaro's Photo Quiz

John Mascaro is President of Turf-Tec International

Can you identify this sports turf problem?

Problem: Brown muddy area
Turfgrass area: Soccer Field
Location: Charleston, South Carolina
Grass Variety: 419 Bermudagrass

Answer to John Mascaro's Photo Quiz on Page 33

Background illustration courtesy of istockphoto.com

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A GOOD SOLUTION TO A SERIOUS PROBLEM

BY **JASON DEMINK, CSFM**

We have recently switched to synthetic turf here at the University of Michigan baseball and softball facilities.

With the new surface there are some new problems that, as a natural grass groundskeeper, I was not used to. Keeping the turf fluffed, keeping infill around first base after lead offs by players and holes in batter's and catcher's boxes. We now rent out the fields more than ever and have switched from letting players use metal spikes to only turf or sneakers to help with the hole and infill displacement.

But the hardest area to take care of is the pitcher's mound. Along with the switch in surfaces, we have cut our staff in half to try to keep labor costs down; but having 155 games in 20 days, for example, resulted in some unforeseen problems. With no time in between games to get everything done there was not time to sweep clay out of the synthetic turf. Big clay chunks were picked up and the mound was patched. But with weather and game schedules, it was not like the baseball season, when we had time to remove the clay build-up after the games.

The turf discolor was hurting in recruiting and was becoming ***unsafe to play on***.

During the summer tournaments, the lip build-up was so great that something had to be done. The turf discolor was hurting in recruiting and was becoming unsafe to play on. With added pressure from the coaching staff, we tried several things to get the Hilltopper clay out.

I had my staff try brooming it back in with a very stiff broom. Next we tried chipping it away with an iron rake. Neither of these worked well. We started power washing it, which worked well enough to get some of the clay out but not all of it. Using a 15 degree tip helped to get the clay out but it made a great mess of the mound. This forced us to rebuild the top 1 or 2 inches of the pitcher's mound. This was not cost efficient with the labor cost and price of clay.

In the past we had an Astroturf halo behind the dish that would get clay in it and we would have a carpet cleaning company clean it out and it always looked brand new. After speaking with my supervisor he suggested having them give it a try. They came out and did a test area and the results were amazing.

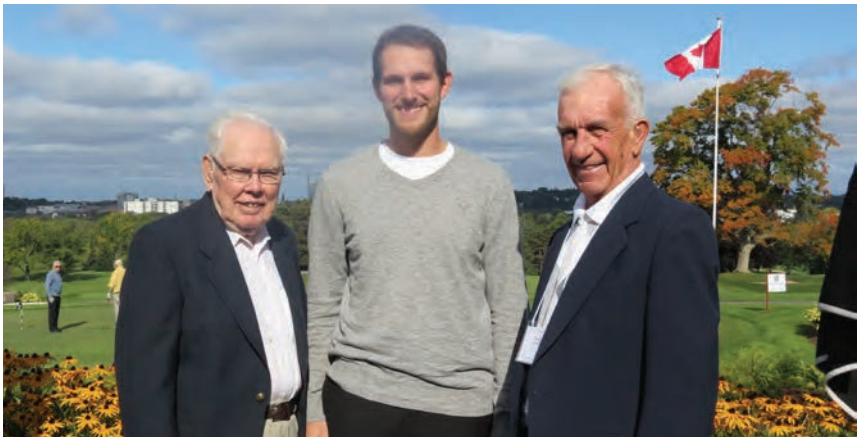
They came out and did a test area and the results were *amazing*.

With this there are some problems though. With their removing the clay it also took up some infill. Having to replace infill is easier than rebuilding the mound. With sand and crumb rubber on site one staff member can fill in one day. It's important to have a good relationship with carpet cleaning company that will come out when needed.

Last fall, with football games regularly drawing student-athletes being recruited, the area had to look good every day; now there is an easier way of getting it done that's cost effective and time efficient. ST

Jason Demink, CSFM, is a sports turf manager for the University of Mi

ACHIEVING SUCCESS IN THE TURF INDUSTRY THROUGH CONTINUING EDUCATION



◄ **Dr. Robert W. Sheard**, for whom the scholarship is named, with 2014 recipient Sydney Ryzebol and Sports Turf Canada past president Paul Gillen at the association's 27th Annual Field Day in Guelph, ON.

BY **SIDNEY RYZEBOL**

The days of progressing along a career path without at least some related schooling are quickly coming to a close, no matter what industry you are in. Colleges and universities alike are offering more and more programs for even the most niche industries, programs that many people would consider to be unnecessary. To some, "Turfgrass Management" would fall into this category. After all, "How much could you possibly learn about growing and mowing grass?" For those of us in the industry, the answer is obvious, "A lot!" No matter what sector of the turf industry you are in it is becoming imperative to have at least a base post-secondary education in the field if you ever hope to become a competent and effective turf manager. Yet the need and importance of education does not end once you have received that "piece of paper" and secured a position within the industry; this should be considered only the beginning. To be a successful sports turf manager, one of the most important resources and tools you can have is ongoing education, as well as the ability to educate the people around you on the job.

ON THE JOB NOT ENOUGH

Like any job, most of the skills a sports turf manager needs in order to perform their duties will be learned simply through experience in the field. Why, then, is education so important? Education is less important in teaching us "how" to do our job, but rather gives us the perspective of "why" that job is being done how it is. This allows us to look with a critical eye at the work being done, and determine whether there is a more effective means of reaching the same or, more importantly, superior results. It is all too easy for a turf manager to fall into a comfortable routine or set of management practices that produce acceptable results with little to no adjustments, year after year, without ever looking critically at what is being done to see if there are improvements that could be made. In most cases, a critical eye can always find ways to improve upon what is being done.

In this ever-evolving industry, it is important that turf managers are working hard to improve and keep pace with the constant new hurdles they are faced with, as there will come a time when "acceptable results" will no longer cut it. An ongoing education can equip us with an ever-expanding arsenal of tools necessary to adapt and come up with new solutions, and ensure that we are keeping a critical view of our management regime to guarantee the continued success of our operations.

There are a number of ways for turf managers to ensure that they are receiving industry specific, ongoing education throughout the duration of their careers. One of the most important ways we can do this is to become an active member of an industry association. These associations strive to support industry professionals in a variety of different ways. They provide members with access to current industry research and up-to-date information through regular publications, magazines, and educational books focused on sports turf. They also facilitate professional development for their members through annual educational conferences, symposiums, workshops, and field days designed to keep sports turf managers informed on current topics within the industry. Finally, they offer access to the wealth of invaluable experience and advice of their network of industry experts, who are there to offer assistance to sports turf managers with whatever turf related problems they are having.

Aside from becoming involved with an industry association, turf managers should always be seeking out and

attending industry trade shows and seminars, enrolling in courses whenever possible, and positioning themselves to attain certification in as many different areas of the industry as possible. This will ensure continual learning and growth, and result in a very well rounded professional who can ideally handle any challenge he or she faces on the job. Taking weekend courses to receive certificates in things like irrigation, becoming a licensed pesticide applicator, or completing short courses when available are all very attainable and highly beneficial steps to take. While it is not necessarily a requirement in all sports turf establishments, taking the steps to become IPM (Integrated Pest Management) certified is one goal sports turf managers, and their respective organizations, should aim for. Becoming IPM certified demonstrates to customers, peers, and the public that your pest management practices meet the very highest standards to guarantee effectiveness and reduce hazards to both people and the environment. It also ensures that you will continue to receive ongoing education, as to remain certified you must obtain continuing education credits.

PASSING IT ALONG

Not only is it important for sports turf managers ourselves to become educated, it is equally as important for us to use this as a tool to then educate the people around us. Firstly, turf managers should be able to pass on pertinent knowledge and educate their staff. This allows the staff to better understand their roles and become more invested in what they are doing. This can ultimately result in less of a burden on the turf manager, as educated staff can be trusted to also look at their work critically and contribute towards achieving more efficient and effective management regimes, benefitting the organization as a whole.

Secondly, turf managers should be able to educate and effectively communicate with upper management to put themselves in a better position to get priority work done. A turf manager must appear competent, and be able to effectively communicate to their superiors what work must take priority, what resources are needed to accomplish this work effectively, and why. If you can explain and give educated justification to your superiors, you will be in a better position to get the work that needs to be done completed in the most effective manner.

Finally, and most importantly, a sports turf manager must be able to effectively educate and communicate with user groups. More often than not, the turf manager and user groups seem to be at odds, with the latter generally being unaware of how their actions, e.g., repeatedly running football drills over the same lines on a field, negatively impact the turf. If user groups can be educated on the reasons behind the management practices being performed on the fields, and informed on how they can work together with these practices, adjusting their usage to make conditions better for both themselves and the turf manager, many recurring problems that frequently arise could be avoided.

It is clear that in order for sports turf managers to be successful in their profession and continue to improve and adapt when new challenges arise, there is a need for us to not only seek ongoing continued education, but also to be able to educate the individuals around us. Going through the motions to achieve "good enough" is not the path to being an effective turf manager. We must constantly be learning to assess our management practices critically, and strive for improvement wherever possible. Opportunities for continued education are abundantly available to all professionals in the turf industry, and it is important for turf managers to take advantage of these. These can result in continued growth and success to you in your profession, and ensure that you are keeping pace with the ever-changing industry. If we can also act as educators to the people around us, the job of being a turf manager can become a lot easier, as it puts the whole ecosystem of staff, management, and user groups on the same team, working together to achieve the same goals.

Now, more than ever, education plays just as important a role in finding success in the turf industry as in any other industry. After all, there is much more to being a turf manager than just "growing and mowing grass." ST

Sidney Ryzebol is the recipient of the 2014 Robert W. Sheard Scholarship. Sidney is in his second year in the University of Guelph's Associate Diploma in Turfgrass Management Program, having completed his summer internship with the City of Guelph. This article was reprinted with permission from Sports Turf Manager, Vol 27, No 3, Autumn 2014.

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John Mascaro's Photo Quiz

Answers from page 25

John Mascaro is President of Turf-Tec International

If you guessed that this muddy turf was caused by a steam roller race, you would be close to being correct. This area was actually caused by a 5-hour, nonstop walking marathon course set up for the "Relay for Life" event. This event boasts a 1/3-mile walking track. The Parks Maintenance Director knew the event was going to be held; however he had no idea that they were going to lay out the track directly on the playing surface. To aggravate things more, the walking portion of the event was held directly on this soccer field after several days of heavy rainfall had occurred. In the relay, teams of between 10-15 people continually walk around and around the course to raise money for the American Cancer Society. Three and a half million people in 5,000 communities across the United States, along with additional communities in 20 other countries, gather to take part in this global phenomenon and raise much-needed funds and awareness to save lives from cancer. So a little turfgrass wear is well worth the effort; however next time they will be asked to stay off the playing surface!

Photo submitted by Patrick Jonas, CSFM, Parks Maintenance Director at St. Andrews Parks & Playground in Charleston, SC.

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.

ALL YOU NEED TO KNOW ABOUT FAIRY RING

BY **DR. MIKE FIDANZA**

My earliest memories from child-hood are working with my father on his mushroom farm in Avondale, PA. We grew the "white button" mushroom, and today Pennsylvania remains the leading producer of edible mushrooms in the USA. I was always fascinated with the biology of those fungi, and years later I am still investigating mushrooms in the form of the fairy ring complex in turf.

Fairy ring symptoms are the most commonly seen disease disorders of turfgrasses worldwide. Fairy ring is not caused by dancing fairies or woodland elves, but is attributed to more than 60 species of basidiomycete (or mushroom) fungi. Fairy ring occurs on golf course turf, athletic fields and pitches, and lawns and landscapes. Fairy ring can occur on all turfgrass species, all climates, all times of the year, and under any and all turf management programs. These basidiomycetes are wood decaying fungi, typically seeking lignin of tree roots, but lignin and organic matter found in turfgrass thatch and within the turf rootzone is on their menu as well. Fairy ring is a curious oddity of nature, but to the turf practitioner it can be a persistent scourge of turf loss and a disruption of turf quality and function. Seeing mushrooms during a walk in the forest is a thing of beauty, but seeing mushrooms and dead, necrotic turf on your morning turf inspection is not.

Classic example of necrotic turf loss (Type I) with appearance of a basidiocarp (mushroom).

Fairy ring is not caused by dancing fairies or woodland elves, but is attributed to more than **60 species** of basidiomycete (or mushroom) fungi.

BIOLOGY OF FAIRY RING

Fairy ring symptoms are classified as Type I, II and III, based on the visual appearance of the affected turf. These symptoms can occur in circles, rings or arcs, because the fungus grows radially from its point of origin in the thatch or soil. Type I is necrotic, dead turf. Type II is dark green, stimulated and lush growing turf. Type III is the appearance of basidiocarps or mushrooms. These three symptoms can occur alone or in pairs or all three at the same spot. The fairy ring fungus does not directly infect turfgrass plants and cause leaf lesions and blights like other pathogens such as *Rhizoctonia* sp. As the fairy ring fungus colonizes turfgrass thatch and rootzone areas, its mycelium and other substances coat sand and soil particles which can cause severe hydrophobicity or soil water repellency. Thus, turf loss is due in part to wilt simply because the roots can't

access any soil moisture. Also, as the fungus breaks down organic matter, ammonium can accumulate to toxic levels which shuts down root function.

Perhaps our current "sustainable" practices, such as a reduction in fertilizer rates, lower mowing heights, increased use of sand for topdressing and rootzone mixes all contribute to the frequent appearance of fairy ring by favoring the growth and development of these basidiomycetes in our turfgrass systems. Also, long wet/dry cycles—either due to the weather or irrigation practices—seems to be related to the appearance of fairy ring symptoms.

Back on the mushroom farm, I remember irrigating the compost beds heavily and then using high-speed air handlers to dry out the growing rooms in order to stimulate mycelial growth and subsequent mushroom production. So, borrowing from my mushroom farming days, it appears that soil moisture management may be the key to fairy ring control in turf.

CONTROL OPTIONS

A fairy ring 'spot' can be eradicated by carefully removing the sod, digging out and removing the soil, replacing the rootzone mix, and seeding or sodding. This is labor intensive and time consuming, and could turn into a large excavating project. Mushrooms can be mowed off easily, but keep an eye that spot for further symptoms to develop, especially during drought stress periods. On close-cut turf, lush, excessive growth is easily scalped, which can lead to wilting and necrotic, damaged turf anyway.

Type II symptoms can be "masked" with an appropriate dose of nitrogen or iron to get the same dark green color over an entire turf area. In addition to urea or ammonium sulfate, there are other soil approach-related products available from 3Tier Technologies, Grigg Brothers, Floratine, EarthWorks, Aqua-Aid, and others.

Several fungicides are currently labeled for fairy ring in turf. For best results, follow the label very carefully, especially for preventive and/or curative statements, and include some key cultural practices. For example, spike or needle tine or "punch holes" into the affected areas first. This may help get oxygen into the rootzone and displace any toxic gases. Next, apply a wetting agent (or soil surfactant) and *immediately* water in enough to wet the rootzone to overcome any hydrophobicity.

Apply the fungicide next, and *immediately* "rinse-in" and wash the product off the turf canopy to the thatch and rootzone target areas. Another time-saving option is to tank-mix the fungicide and wetting agent and apply together followed by irrigation. Again, check the fungicide product label for recommendations on using wetting agents. Keep in mind, repeat applications may be needed for either a preventive or curative program.

It seems that every case of fairy ring is unique and different. It may be severe one year but not the next. What products or practices work on one ball field may not work at another site. As previously mentioned, soil moisture content should be considered when battling fairy ring. Soil moisture monitoring is useful to help make decisions on irrigation practices. Most importantly, the use of wetting agents should help to alleviate those extreme wet/

Penn State turf alum Tom Malehorn standing inside type I fairy ring.

Left: **Type I** fairy ring symptoms on a football field.
Right: **Severe type I** fairy ring on a fairway.

Left: **Example** of a "shaggy mane" mushroom common in lawns.
Right: **Close-up** of commercial "white button" mushroom production.

Type II fairy ring on a baseball field.

Active Ingredient(1)	Trade Name and Formulation(1)	Application Rate (oz or fl oz /1000 sq ft)(2)	Interval(days)(2)	Product Label Remarks(2)
Azoxystrobin	Heritage 50WG	0.4	28	Apply as soon as possible after fairy ring symptoms develop. Apply only in 4 gallons water per 1000 sq ft. Add the recommended rate of a wetting agent to the final spray. Severely damaged or thin turf may require reseeding. Fairy ring symptoms may take 2 to 3 weeks to disappear following application. Reapplication after 28 days may be required in some cases.
Azoxystrobin	Heritage TL 0.8ME	2	28	Same as listed for Heritage 50WG.
Azoxystrobin	Heritage 0.31G	2 to 4	14-28	Apply as soon as possible after fairy ring symptoms develop. Irrigate with at least 0.5 inches water within 24 hours after application if rainfall is not expected. Severely damaged or thin turf may require reseeding. Fairy ring symptoms may take 2 to 3 weeks to disappear following application. Reapplication after 14-28 days may be required in some cases.
Azoxystrobin + Difenoconazole	Briskway 2.72	0.5 to 0.725	14-28	For preventive control of fairy ring, apply early in the spring prior to the development of symptoms. Apply in 2-4 gallons of water per 1000 sq ft. Irrigate into the thatch prior to the spray drying. Repeat the application within 14-28 days after the first application
Azoxystrobin + Propiconazole	Headway 1.39EC	1.5 to 3	14-28	Apply as soon as possible after fairy ring symptoms develop. Apply in 2-4 gals. of water per 1000 sq. ft. Add the recommended rate of a wetting agent to the final spray. Severely damaged or thin turf may require reseeding. Fairy ring symptoms may take 2 to 3 weeks to disappear following application. If area is hydrophobic, use wetting agents and irrigate prior to application(s) of Headway. Reapplication after 28 days may be required in some cases.
Azoxystrobin + Propiconazole	Headway 1.06G	2 to 2.5 3 to 5.4	14 28	Same as listed for Heritage 50WG.
Fluoxastrobin	Disarm 480SC	0.28 to 0.36	21-28	Apply as soon as fairy ring symptoms develop in 4 gallons water per 1000 sq ft or irrigate after application with ¼ inch water. A wetting agent may facilitate penetration.
Fluoxastrobin + Chlorothalonil	Disarm C 4.25SC	4.5 to 5.9	21-28	Same as listed for Disarm 480SC.
Flutolanil	Prostar 70WG (or Prostar 70WP)	2.2 4.5	21-28 30	Preventive (2.2 oz): apply in 10 to 50 gallons of water per 1000 sq ft, may suppress development of fairy ring caused by various basidiomycete pathogens. A second application may be made at 21-28 day interval using the same dosage rate. Curative (4.5 oz): apply in 10 to 50 gallons of water per 1000 sq ft, may sup press development of fairy ring caused by various basidiomycete pathogens. Application should be made to the affected area at the first sign of ring development (greening, death of turf, mushrooms). Symptom suppression may be temporary and symptoms may recover. In those cases, a second application at 4.5 oz per 1000 sq ft is suggested, not less than 30 days after the first application. Aerification prior to subsurface applications has been beneficial in some cases. Use of a nonionic surfactant in combination with Prostar 70WG is recommended. Treated areas should be irrigated prior to and after application with sufficient water to maintain growth of turf. Disease control is improved if turf is maintained at optimum fertility levels after symptom development. Turf that has been damaged extensively by fairy ring development may have to be reseeded. Do not treat more than 10,000 sq ft per acre of turf area.
Metconazole	Tourney 50WDG	0.37	21	Apply as soon as possible after first symptoms appear. Apply in a volume of 4 gals per 1000 sq ft. For optimal control reapply after 21 days. Symptoms may take several weeks to disappear following application.
Polyoxin-D	Affirm 11.3WG	1 oz	7	Make two to three applications on a 7-day interval Schedule. Use a penetrating wetting agent. Immediately following application, water-in the treatment with sufficient irrigation (1/8-1/4") to wet the active root zone.
Pyraclostrobin	Insignia 20WG	0.9	28	Apply as soon as possible after fairy ring symptom development. Fairy ring symptoms may take 2 to 3 weeks to disappear following application. Use 4 gallons of spray volume and appropriate soil wetting agent at time of application. Reapplication after 28 days may be required.
Pyraclostrobin + Boscalid	Honor 28WG	1.1	28	Apply as soon as possible after fairy ring symptom development. Fairy ring symptoms may take 2 to 3 weeks to disappear following application. Use 2 to 4 gallons per 1000 sq ft spray volume and appropriate soil wetting agent at time of application. Reapplication after 28 days may be required. Provide short irrigation cycle directly following treatment to move fungicide through thatch.

Active Ingredient(1)	Trade Name and Formulation(1)	Application Rate (oz or fl oz /1000 sq ft)(2)	Interval(days)(2)	Product Label Remarks(2)
Tebuconazole	Torque 3.6SC	0.6	28	2ee Label - Preventive: Apply before fairy ring symptmos appear in the spring starting when 5 day average soil temeratures at 2 inches reach 55-60F. Use sufficient water volume (66 to 132 GPA). Water the application into the active root zone within 4 hours for best results. User should make a second application when 5 day average soil temperatures reach 65-70F. Do not exceed a 28 day interval between applications. Torque may also be tank mixed or rotated with Affirm as allowed on the label. Do not apply to over-seeded bermudagrass during spring transition. Complete green-up should occur before treatment to avoid potential growth reduction. 2ee Label - Curative: Applyl to areas where fairy ring symptoms are present. Use sufficient water volume (66 to 132 GPA). Water the application into the active root zone within 4 hours for best results. Use a wetting agent as required for the penetration of active hydrophobic soil conditions. User may make a second application in the same manner utilizing a 28 day interval. Torque may also be tank mixed or rotated with Affirm as allowed on the label.
Triadimefon	Bayleton FLO 4.15SC	1 to 1.9	14-21	Preventive Rate: Apply recommended rate in 2 - 4 gallons of water in the spring prior to appearance of fairy ring symptoms. Before the spray dries, irrigate to wash the fungicide into the thatch/soil where the fungus is active. Repeat application 14 days later.If the 1.9 ounce rate is used on Poa annua putting greens, extend the interval to 21 days.

(1)Refer to the product label for information on the FRAC codes and manufacturer of the product.
(2)Refer to the product label for specific information and instructions for safe and effective use. This list may not be inclusive of all commercially available products. For example, Zerotol, Consan and Sys-Star contain fairy ring statements on their product labels.

dry cycles associated with the appearance of fairy ring symptoms, and aid in turf recovery.

Fairy ring remains a curious oddity of nature, and managing fairy ring symptoms in turf requires a multi-faceted approach along with patience and persistence. ST

Mike Fidanza, PhD, is Professor of Plant and Soil Sciences, Penn State University - Berks Campus.

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SAVE ON EQUIPMENT WITHOUT SACRIFICING TURF CONDITIONS

Editor's note: *Jim Sartain is President of Global Turf Equipment.*

BY **JIM SARTAIN**

In today's uncertain economic climate, owners, operators and managers of sports fields and facilities are intensely focused on retaining and attracting new users while cutting costs.

This balancing act has led to a paradigm shift whereby public and private entities alike are scrutinizing each and every expense. In this environment, the purchase of new turf maintenance equipment frequently poses an uphill budgetary battle.

When funds are in such short supply, what do you do if you need to replace damaged or out-of-date mowers, top-dressers or utility vehicles? As turf professionals know all too well, buying new equipment is often prohibitively expensive. Another negative to being the first purchaser is taking the hit on the largest chunk of depreciation.

To tackle these financial impediments, many have found the answer is buying or leasing high-quality, pre-owned machines.

Owners and operators achieve the same high-standard of turf conditioning, while realizing exceptional savings. The net gains from opting for pre-owned equipment can then be reinvested in capital improvement projects. In an increasingly competitive environment, these then serve as attractive lures to snatch greater market share.

Facilities and municipalities across the country are benefitting from employing alternatives to brand-new equipment. For example my company offers savings of up to 50% off prices for brand-new equipment; our 750-piece inventory includes mowers, topdressers and spreaders; turf aerators, sprayers, vacuums and blowers; utility vehicles and more. Housed in a 40,000-square-foot warehouse outside Tampa, FL products from brand leaders Club Car, Jacobsen, John Deere, Toro and more are offered.

In partnership with major financial lending firms, Global Turf Equipment purchases late-model equipment coming off short-term leases. This preference for models that are frequently only several years old means the company is intimately familiar with the ownership history of every item in stock. This peace of mind is a major reason why customers come back time and time again.

Moreover, all machines purchased from Global Turf Equipment have received a thorough inspection to ensure they are fully functional. Areas examined include the engine, drive train, electrical system, hydraulic system and cutting units. They also come with a minimum of 50% of reel and tire life remaining, as well as new oil and oil filters, fuel and fuel filters, spark plugs, hydraulic fluid and hydraulic filters, rotary blades, bedknives, and more.

The company also offers a "refurbishing" option that involves rebuilding the equipment from the ground up. A team of technicians will completely disassemble the machine (all wheels, seats, body panels and covers are removed, leaving just the frame and engine). Reels and cutting units are also broken down. The machine is then thoroughly inspected for faulty and worn parts which are replaced or repaired as needed.

A refurbished machine will also be rebuilt with all major and minor wear parts replaced where appropriate (for example, bushings, bearings, hoses, belts and seals) and receive a cosmetic overhaul to include, as needed, new paint, decals and grip tape.

Not to be overlooked, there are also companies that offer short-term rentals for those who have a special "emergency" need for equipment. For example, Turf Equipment Rental of Florida gives the option of 2-day, weekly and monthly rentals. This option is ideal for situations when budget monies have not been allocated or if machines are needed temporarily for a specific job.

Unprecedented times often call for a change in business practices. Creative approaches to lowering bottom-line costs without sacrificing operational quality are available. In many ways, these programs

mirror BMW's very successful "Certified Pre-Owned" luxury automobile program, offering an affordable alternative to help conquer budgetary battles. If this mindset is good enough for discerning car drivers, shouldn't it also be for turf care professionals? ST

Jim Sartain is President of Global Turf Equipment (866.588.3092, www.globalturfequipment.com), the world's largest seller and exporter of pre-owned golf course equipment, and CEO of International Club Suppliers (www.intlclubsuppliers.com).

TECHNICAL ANALYSIS OF TURF PROTECTION SYSTEM ENGINEERING

For the casual observer to an out-door event the turf upon which stages and platforms are built, pedestrians walk and vehicles traverse, is likely of the least concern. The event is the draw and the turf is just there; neither noteworthy nor special. But to owners of the turf it is everything and the condition of the turf is likely the very reason why the events occur there in the first place. Upon scouting for a site an event organizer has many logistical concerns but one at the top of the list is the very ground upon which everything will happen. Will the ground be stable, will it turn to mud if it rains, will it handle vehicles, stages and staging areas, intense pedestrian and vehicular traffic and will it be the last thing anyone talks about? After all, the attendees came for the event and the satisfaction gained from attending the event. The organizers do not want the topic of conversation to be about poor access and poor/muddy/wet ground conditions that may have sullied the attendee's experiences and the owners do not want a hefty post-event price tag to restore the turf.

While not an abundance of studies have been performed with respect to this issue, recent studies have used science to provide the facts and details that can lead the user to the best conclusion and the best material selection.

To better select the appropriate turf protection method for a specific use, detailed analyses have been performed giving consideration to A) turf effects from the use of protection materials, B) scientific measurements to assess turf health, C) evaluation of protection materials, D) field testing, and E) results.

Four types of turf protection covers are currently available, used either singularly or in combination and include 1) plywood, 2) polyester mesh fabric, 3) single-sided plastic covers, and 4) double-sided plastic covers. The use of each is generally situation-dependent. For example, covers that do not allow irradiance may be used under a stage while covers that allow irradiance may be used for seating, pedestrian, and vehicular travel areas.

Stress to turfgrass is caused primarily by wear and soil compaction. Wear injury occurs from the tearing caused by the abrading of the turf leaves by both pedestrian and vehicular traffic. Soil compaction has an indirect influence on plant responses by altering the physical characteristics of the soil. When turf protection covers are in place direct wear injury does not occur but soil compaction does occur. The protective covers, however, create other stresses such as restricted airflow, blocked or restricted moisture, heat accu-

Turf protection system installation at FedEx Field in Washington, DC.

PHOTO COURTESY OF MATRAX, INC.

mulation and irradiance infiltration. These covers may be in-place for a typical period of four to eight days but events lasting up to 20 days are not uncommon.

Applying science to the study and use of turf protection is becoming more sophisticated and is providing the type of data that allows the user to make an informed choice of turf protection covers. There are five main types of scientific measurements that have been made to assess the levels of stress on the individual plants. Light energy is necessary for photosynthesis; a critical factor in plant health. In the area of turf protection, translucent covers provide exposure of plants to the sun and photosynthesis. In tandem with light energy is the orientation of the individual leaves. Plant leaves that are nearly vertical only absorb light in the upper part of the leaf. Translucent covers provide the only opportunity for photosynthesis to continue while the turf is being protected. Light quality and light quantity both play an important role in turf health. The growth and development of turf grasses are greatly influenced by the quality and quantity of light available for photosynthesis. Opaque covers do not provide for the absorption of light so leaf quality suffers distress. Multispectral radiometry measures plant light reflectance in the visible and near-infrared ranges and provides an objective method for estimating turf grass quality or green cover.

Studies were conducted in growth chambers at the Virginia Bioinformatics Institute facility and in the field at Virginia Tech Turf Grass Research Center. The growth chambers were established to evaluate two different irradiance and soil moisture conditions. Field studies were conducted in spring, summer and fall with event covers in place from 2 to 20 days. Four covers were evaluated in the growth chamber and in the field: 1) single-layer plywood, 1.9 cm thick opaque cover; 2) plywood with polyester mesh fabric, opaque cover; 3) single-sided plastic, translucent cover; and 4) double-sided plastic, translucent cover. Various combinations of light, moisture and compaction were used to evaluate the turf grasses under different levels of distress all compared to a well-maintained control sample.

Field trials were conducted over a 2-year period with two trials of each type of cover in each season of the year; spring, summer, and fall. Temperature, moisture, compaction, light quality and quantity and other factors previously discussed were closely monitored. From the growth chamber and field tests the findings were documented as follows:

- Turf under the double-sided plastic, translucent cover displayed a lower degree of heat stress symptoms in summer compared to the other covers. The air space between the top surface and the solid back acts as an insulator.
- Both translucent covers maintained the best percent green cover and the calculations predicted that the maximum number of days the turf could be covered and still recover was greater than 20 for both.
- The double-sided translucent cover allowed for better green cover during high temperature periods when compared to the single-sided translucent cover. Temperatures under the former were up to 30% cooler than latter.
- Both translucent panels provided long-term protection (>20 days) and turf recovery. But the single-sided model sank into the turf when driven over, resulting in damage to the turf and soil compaction (saturated soil conditions were present at the beginning of the 2010 season). The solid back of double-sided model eliminated such "creasing" but matted the turf consistently.
- The double-sided model provided the advantages of greater protection in summer heat and quality retention in all seasons.

The testing program was prepared and conducted by John Paul Royse, submitted as his Master of Science thesis in crop and soil environmental sciences, Virginia Polytechnic Institute and State University, 2012. ST

SOLVING *POA ANNUA* PROBLEMS IN NEW JERSEY

Editor's note: *This article was supplied by ClaytonHimes PR on behalf of their client FMC Professional Solutions.*

Ray Cipperly is proud of the baseball field he built with students and maintenance staff 40 years ago on the East Brunswick, NJ campus of Middlesex County Vocational Schools. As a physical education teacher and baseball coach at the school, he wanted the stu-

Ryan Radcliffe, head groundskeeper, and **Ray Cipperly**, Athletic Director, Middlesex County Vocational Schools.

dents to have a better playing experience than they'd been having on the natural lay-of-the-land field behind the school.

"We decided where the bases and home plate should be, cut it out with a sod cutter and picked up all the rocks," says the now-district athletic director for five Middlesex Vocational high schools. "Everything went fine until we decided to renovate the field 9 years ago."

Cipperly worked with nearby Rutgers University and numerous volunteers to tear out infield grass and foul territory, non-selectively control the outfield grass, re-grade and reseed with five different varieties of Kentucky bluegrass. The field established beautifully.

"It looked like a sod farm… at first," says Cipperly, who took short courses in turfgrass management at Rutgers, as well as assisting two minor league New Jersey ballparks as head groundskeeper for several years.

"Then we started seeing spots of light green grass coming in-*Poa annua*," he continues. "We had gorgeous grass and then ugly green patches moved in. Apparently, *Poa annua* seed was in the soil and we disturbed it while re-grading the field."

AN 8-YEAR BATTLE

For the past 8 years, Cipperly has been battling the stubborn *Poa annua*, trying "everything under the sun" to eradicate the invasive grass. Head groundskeeper Ryan Radcliffe joined him in the fight 2 years ago, when he came onboard with Middlesex District schools after 14 years with the Philadelphia Phillies system, 4 years with the Reading Phillies and 10 years with the Lakewood BlueClaws on the Jersey shore.

"We manage 14 fields among the five schools, including soccer, softball and baseball, but the East Brunswick field is the only problematic one, the one where *Poa* won't go away," says Radcliffe, whose seven crew members float between the schools.

For general maintenance, Radcliffe cuts the field at 1.25 inches everyday during the season, and every other day in the fall. He aerifies, topdresses and overseeds each year with a Kentucky bluegrass seed blend of 30% Midnight Star, 30% Brilliant and 40% Princeton P-105. Weather permitting, he rototills and laser grades infields in the fall, as well. His five-step fertility program includes two spring applications, one during summer months and two in the fall.

Middlesex District contracts with a local lawn care company for pesticide applications, which include as-needed fungicide, herbicide and insecticide treatments. "We practice a very strict Integrated Pest Management plan with all of our fields," adds Radcliffe. "The East Brunswick baseball field is so lush; we wouldn't need any herbicides if it weren't for *Poa annua*."

After trying multiple different products, including conventional herbicides, plant growth regulators and a three-step organic program approach, Cipperly and Radcliffe finally saw results this year with a combination of Xonerate and Tenacity herbicides.

They began experimenting with the products 2 years ago, in combination with their existing IPM program. They first applied Tenacity at the registered rate 4 weeks in a row in the spring. Then they came back in the fall with three applications of Xonerate every 10 days. "By the following spring, there was a lot less *Poa annua*," says Cipperly.

The East Brunswick baseball field in 2011, when *Poa annua* prevailed.

Left: The field again in 2012, before Cipperly and Radcliffe started the Xonerate and Tenacity program. **Right: The field in March 2013**, after using Xonerate and Tenacity the previous year. Poa annua was dying off.

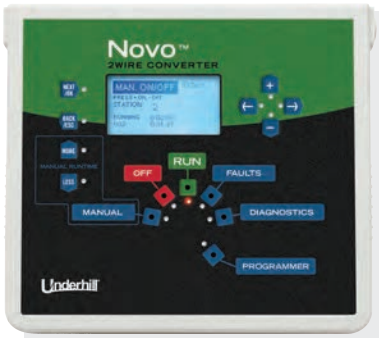
After overseeding the field with a perennial ryegrass/Kentucky bluegrass mix to fill in where *Poa annua* had been suppressed, they repeated the program in 2014. By mid-season, it was clear the *Poa* population had decreased by an estimated 70%.

"It worked!" says Cipperly. "It just comes down to getting the timing right."

As a final step, Cipperly and Radcliffe began using Xonerate and Tenacity together at low rates this fall to continue promoting Kentucky bluegrass and perennial ryegrass and suppressing *Poa*. Going into winter, Cipperly felt confident he finally had a handle on his never-ending problem.

"We are committing to this program," he adds. "These products have worked better than anything else I've tried. When baseball season starts up next spring, we're looking forward to gorgeous grass on our East Brunswick field again." ST

The field as it appeared in fall 2014. Poa annua has decreased by an estimated 70%.



UPDATED NOVO 2WIRE CONVERTER FROM UNDERHILL

The Novo 2Wire converter from Underhill is now available with built-in testing and programming features, along with improved diagnostics. Novo Model W-NOV-2U has the ability to test and program field decoders and 8-station senders (used on sites with more than 32 stations). No additional wire harnesses are required. The user plugs in the connectors, slides the switch from "run" to "program," and can test or program a decoder or sender as needed. Model W-NOV-2U also has a new diagnostic feature that avoids repeated callbacks by clearing a displayed field fault to confirm it has been resolved. Versatile and easy to install, Novo is compatible with all major controllers. Hunter, Rain Bird, Irritrol, Toro, and other popular brands, can be converted to total two-wire or applied in a "hybrid" application using both two-wire and multi-wire systems.

Underhill

EP MINERALS INTRODUCES BALLGAME CHANGER AND PLAYBALL! FOR INFIELDS

EP Minerals, LLC has launched BallGame Changer with KT3, a patent-pending premier infield conditioner, the PlayBall! drying agent, PlayBall! mound clay, and the PlayBall! infield conditioner. "These specially designed products have been successfully performance-tested at major league, minor league, college, and high school fields around the US with excellent results. BallGame Changer and the PlayBall! keep your infields safe with better traction, and your infield remains more playable because they do a great job of controlling moisture," said VP of performance aggregates, Jeff Kitchens. "BallGame Changer with KT3 is a revolutionary new clay product. KT3 is a patent-pending surface technology that changes how the BallGame Changer product interacts with water. You can apply the normal amount of water and conditioner with BallGame Changer as you use today and maintain a higher moisture level for nine innings, reducing dust and additional maintenance factors."

EP Minerals

NEW GARY'S GREEN ULTRA, FOLIAR PRODUCT FROM GRIGG BROTHERS

Grigg Brothers is pleased to announce the availability of a new and improved formulation for one of its flagship products, Gary's Green Ultra 13-2*-3 + 1.4% Fe, 0.2% Mn, 0.2% Zn, 0.12% Cu. The enhanced formulation uses the same basic organic chelation technology built for efficiency, quality, performance, and compatibility, and has been fortified with additional seaplant extract for enhanced turfgrass stress tolerance and magnesium (Mg – 0.5%) to improve plant nutrient status and color. Gary's Green Ultra represents an advanced combination of current products Gary's Green and Ultraplex, it is designed for use in all seasons, and contains exclusive Elicitor technology, a non-ionic surfactant, and buffering agent. Gary's Green Ultra should be an integral component to any spoon feeding nutrient program, providing essentially six products in one without the need for mixing, and offers the most efficient nutrient formulation available to turf managers.

Grigg Brothers

NEW 2015 BOBCAT UTILITY VEHICLES

Workers wanting to get tasks done more quickly and efficiently won't have to look any further than the new 2015 four-wheel drive Bobcat 3400 and 3400XL utility vehicles, with improved suspension systems, industry-leading payload and towing, faster travel speeds and more

integrated accessories. Both models have a sealed constant velocity transmission and are available with two engine configurations: a 40-hp gas engine or a 24-hp diesel engine. The gas units provide easier start-up and responsive acceleration with an electronic fuel injection system, which adjusts to temperature and altitude changes. The diesel units have automatic glow plugs that adjust to colder starting conditions. Acceleration is not a problem with these vehicles, as they can gain speed smoothly and quickly. An ergonomic lever allows 3400 and 3400XL utility vehicle operators to shift between high, low, neutral and park positions. The four-wheel drive system allows operators to shift on-the-fly to adjust to changing ground conditions.

Bobcat

LOUISVILLE SLUGGER GAME TIME INFIELD CONDITIONERS

H_2O/ABZORB is a calcined clay product used to quickly dry puddles and muddy conditions. The finer gradation has more surface areas to dry the field faster, reducing rain delays. This product will not stick to cleats and is easily incorporated into the infield. Benefits include: improved safety, prevents rainouts, quickly absorbs excess water, reduces compaction, incorporates well into infields, improves drainage, controls moisture, and gives a rich color to infields

Game Time Sports Systems

STMA BOARD OF DIRECTORS' ELECTION RESULTS

Following STMA's Nominating Committee finalization of the slate of candidates for the 2015 election, each voting member was sent an email with a specific link to cast their vote. Paper ballots were also made available for those who did not have an email address. The voting process began November 17 and closed December 12. Many members voted and made their voices heard for the leadership they wanted. Thank you to all who participated!

The bolded names below identify the winning candidate for each specific match-up.

OFFICERS

Immediate Past President: David Pinsonneault, CSFM, CPRP, Town of Lexington, Lexington, MA

President: Allen Johnson, CSFM, Green Bay Packers, Green Bay, WI (see interview on page 8 this issue)

President-Elect: Jeff Salmond, CSFM, University of Oklahoma, Norman, OK

Secretary/Treasurer: Jeffrey Fowler, Penn State Cooperative Extension, Franklin, PA

Or

Timothy Van Loo, CSFM, Iowa State University, Ames, IA*

DIRECTORS

Professional Facilities: Phil McQuade, Dicks Sporting Goods Park, Commerce City, CO

Or

Dan Bergstrom, Houston Astros, Houston, TX*

Higher Education: Vacant due to T. Van Loo slated in Secretary/Treasurer; to be appointed by the President

Schools K-12: Andrew Gossel, Covenant Christian High School, Indianapolis, IN

Or

Bobby Behr, CSFM, Ashley Ridge High School, Summerville, SC*

Academic: Vacant due to J. Fowler slated in Secretary/Treasurer; to be appointed by the President

Commercial Director: **Doug Schattinger, Pioneer Athletics, Cleveland, OH***

Or

Jimmy Rodgers, CSFM, Luck Stone Co., Ruckersville, VA

At-Large Elected: **Jimmy Simpson, CSFM, Town of Cary, Cary, NC (Parks & Rec)***

Or

James Bergdoll, CSFM, Elizabethtown Sports Park, Elizabethtown, KY (Parks & Rec)

At-Large Appointed: To be appointed by the President

(Not up for election) Sarah Martin, CSFM, City of Phoenix, Phoenix, AZ is starting the second year of her 2-year term as the Director representing the Parks and Recreation segment.

***Indicates winning candidate**

2014 SCHOLARSHIP & GRANT WINNERS

Two- Year Winners	**Scholarship Name**	**School Name**
Todd McGuire	Dr. Fred Grau Memorial Scholarship	Kirkwood Community College
Four-Year Winners	**Scholarship Name**	**School Name**
William Ellinger	Dr. James Watson Undergraduate Scholarship	Pennsylvania State University
Zachary Avers	SAFE Four-year Scholarship	Ohio State University
Brandon Bousema	SAFE Four-year Scholarship	Iowa State University
Brandon Porch	SAFE Four-year Scholarship	University of Tennessee/Knoxville
Graduate	**Scholarship Name**	**School Name**
Joshua Lenz	Dr. James Watson Graduate Scholarship	Iowa State University
Chrissie Segars	SAFE Graduate Scholarship	Oklahoma State University
Gary Vanden Berg Internship Grant		**School Name**
Jeremy Langlois	Gary Vanden Berg Internship Grant	University of Massachusetts/Amherst
Terry Mellor Continuing Education Grant		**Organization Name**
Daniel Losito	Terry Mellor Continuing Education Grant	North Carolina State University

CHAPTER SPOTLIGHT: KENTUCKY STMA (KYSTMA)

STMA will be highlighting accomplishments from select chapters in every issue of *SportsTurf*. If you have new developments or success stories in your chapter, please email Sales & Marketing Manager Shant Thomas at sthomas@stma.org. We look forward to highlighting your chapter!

[From KySTMA President James Bergdoll, CSFM's November 2014 update to chapter and affiliated STMA members:]

Hello friends and fellow Sports Turf Managers!

It was great to see a lot of you at the KTC Conference a few weeks back in Owensboro. I thought the event was very successful with a great turnout, great group of presenters, and of course a wonderful new venue. I would like to congratulate and thank the KTC Board and Mr. Bucky Trotter for a fantastic event! I would also like to thank them for allowing us to be a part of the conference and especially thank Bucky for basically single-handedly putting together the whole sports turf education program! Also, a big thanks to Dan Bergstrom for coming all the way from Houston, much appreciated! Thanks again to Marcus Dean, Mike Winkenhofer, Dr. Munshaw, and Dr. Woosely for also participating in presentations. Thanks to all of you who attended, I hope you got something out of it you can actually use. Finally, congratulations to Marcus Dean on being named KTC Man of the Year!

The KySTMA Annual meeting took place with an update on membership, finances, and thanked our sponsors. As of October 2014, we currently have 37 commercial members, 32 Sports Turf Manager members, and three coaches and educator members. Our finances stand at $3,447.50 in the bank after presenting a $2,500 check to the KTC for research and scholarship. Thank you to Secretary/Treasurer Aaron Boggs for keeping all of this important information in order!

Again, thank you everyone for a great year and I think we have built a great foundation to grow and do more. I hope that in 2015 we can start up a sports turf scholarship program in memory of Dr. Powell, develop a field renovation program, a Field of the Year award program, have another successful Field Day, and perhaps a social event just to name a few. Please if you have any ideas, let me know. I have a few more individuals I would like to thank for a successful year before I wrap up: Eric Harshman, Brad Nevitt, Aaron Boggs, Dr. Munshaw, Craig Mylor, Mickey Lovett, Bucky Trotter, Mike Winkenhofer, Mike Mason, Carla Hagan, Chris Waldridge, and Marcus Dean. Thanks everyone.

James Bergdoll, CSFM
KySTMA President

Contest Winner

SportsTurf and the Sport Turf Managers Association conducted an online "Mowing Pattern" contest at the end of last year. More than 2,000 people viewed the 26 entries; the winner was Ben Young of Minor League Baseball's Altoona Curve for this "Four Patterns, One Field" design.

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, Dale Croft, dale.croft@ocps.net

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

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

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

Illinois Chapter STMA: www.ILSTMA.org.

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

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

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

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

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

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

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

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

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

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

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

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

Northern California STMA: www.norcalstma.org.

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

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

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

Ozarks STMA: www.ozarksstma.org.

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

Southern California Chapter: www.socalstma.com.

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

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

Texas Sports Turf Managers Association: www.txstma.org

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

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

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F ❑ Sports Complex G ❑ Athletic Field and/or Park Architect/Designer
T ❑ School, College or University P ❑ Park
H ❑ Other (please specify)_____

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

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

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

4 Yearly operating expenditures (excluding salaries)

F ❑ Over $1 million C ❑ $50,001 - $100,000
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D ❑ $100,001 - $500,000 A ❑ $25,000 and under

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FEBRUARY 2015

SportsTurf Magazine ADVERTISERS' INDEX

Q&A with Dr. David Minner

Professor, Iowa State University

SWAN SONG

Editor's note: *This is Dr. Minner's final "Q&A" column after nearly 20 years of answering your questions about maintaining sports turf. Thank you, Dave, your knowledge and honesty will be missed.*

"To everything there is a season." I closed the October 2014 "Q&A" column with this Bible verse quote made even more famous by a song from my second hero, Pete Seeger. As soon as the one ran into the zero I knew the end of my playing season had come. Not knowing which came first, sorrow or relief, they both settled into a crooked smile of agreement; the time was now.

The sports turf industry is full of hardworking, salt of earth people who are talented and creative problem-solvers. Somewhere in the past, sports influenced you and somehow along the way you learned to take care of the natural things around us that we all love. I have been blessed to call so many of you friends and there are far too many to mention here, but I wanted to recognize a few who have helped my sports turf path through mentorship and friendship: George Toma, Mike Andresen, Dale Getz, Jeff Wendel, Dana Robes, Kevin Mercer, Andy McNitt, Ross Kurcab, Linda Wightman, Bill Daniel, Vince Patterozzi, Joe Wagner, Abby McNeal, Jackie Butler, Johnny Bryan, Steve Wightman, Skip Gardner, Jim Watson, Kevin Trotta, Jeff Salmond, Trey Rogers, Bill Shirk, and Zac Reicher. Thank you all for your questions, advice, and mentorship that stayed with me throughout my career. Do you recognize anybody that we share in common? Take a minute to make your own list. If you are new to the sports turf world you'll find a network of people, some in your neighborhood and some across the country, who are willing to help you along the way; a good place to start is membership in the Sports Turf Managers Association at www.stma.org.

The diversity of your problems and concerns over the years has truly kept me engaged and entertained and whether you liked it or not I have written about it a time or two. Thanks also to all the conference planners who have invited me over the years to speak to your constituents. There are so many people I have come to recognize even though I can't remember a name; I'm so bad with names!

There is a fellow from Colorado named Roger who always waited patiently for me to finish a seminar and then would ask the big questions. When I see myself giving turf talks over the years he always pops into my head, representing all your wonderful ideas, thoughts, goals, and passion that you've shared with me.

It is comforting to know that Pamela Sherratt of The Ohio State University will be jumping on the mower to stripe the field after me. Well known and respected in the sports turf industry, Pamela and her colleagues bring a wise blend of research and problem-solving that will keep you turning to the last page first when you settle into this magazine.

If you email me I will try to respond or maybe I'll be fishing. If you ask me a complex question maybe I'm too busy because I'm showing a kindergartener how worms turn food scraps into garden soil. If you want to find out what I'm doing now, please read Eric Schroder's column in the January 2015 issue on page 6. If you want to come visit be ready to work in the garden or on the most abused athletic field in the Caribbean; I do need help.

It just wouldn't be a "Q&A" if I didn't give a little advice and observation so here's a few:

- Determine first if you have a grass problem or a people problem and then act accordingly; solving the people problem usually solves the grass problem.
- Expand your potential job market by embracing the concept of pesticide-free fields even if this mandate has not yet been forced on you. As an industry we should have been in front of this issue and we were not. This new knowledge base makes you a more vital entity to your employer's sports management team.
- The greatest form of flattery is when someone uses your ideas to their advantage; give freely of your information and congratulate those who steal your ideas because they are really paying you a compliment . . . and boy have I complimented many of you over the years. Thanks again.

Well, I'm growing different plants now but there is not a single day that passes without recognizing a friendly clump of grass, or weeds that I would manage differently, or some turfy thing that makes me stop the EARTH truck and jump out for a closer look. I'll never stop looking down, jabbing my dull knife into the ground and wondering, Why? It has been oh so much fun sharing those mysterious few inches with you that covers our greatest playground: sportsturf. ST

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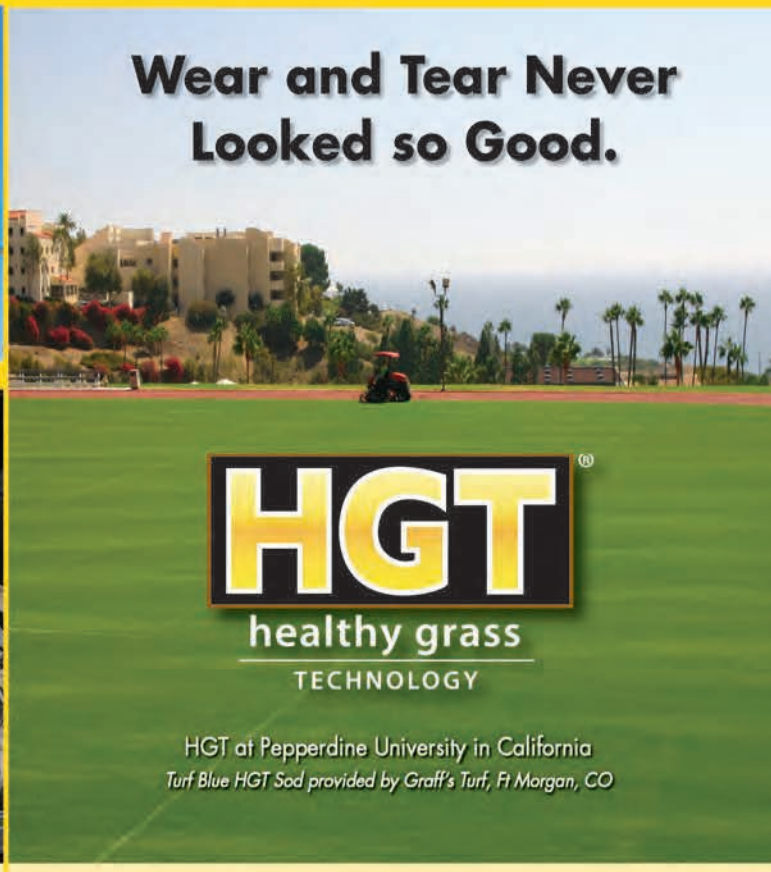

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