TIPS FOR BEGINNER TURF MANAGERS

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August 2016

SportsTurf

SPORTS FIELD AND FACILITIES MANAGEMENT

SportsTurf Managers Association

green media

DRONE'S EYE VIEW

Collegiate School, Goochland, VA

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The Interview: Cale Bigelow, PhD

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STARTING LINEUP

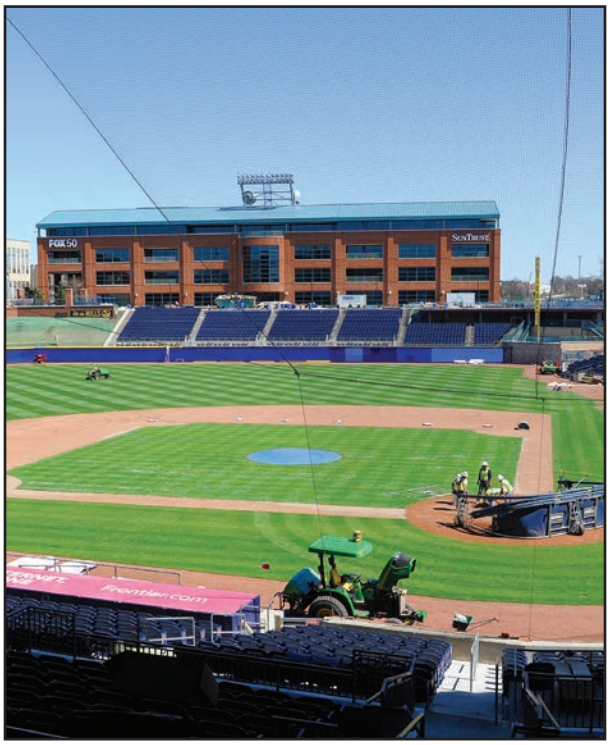
August 2016 | Volume 32 | Number 8

FEATURES

DEPARTMENTS

ON THE COVER:

Allison Moyer, Grounds Supervisor at the Collegiate School in Goochland, VA, and her staff, Tito Fortis, Mark Chambers, and Jesse Garrant, manage 12 natural grass athletic fields, two synthetic turf fields, and all of the grounds surrounding their two campuses (approximately 100 acres). They were fortunate to have a drone taking photos of the winning field earlier this year.



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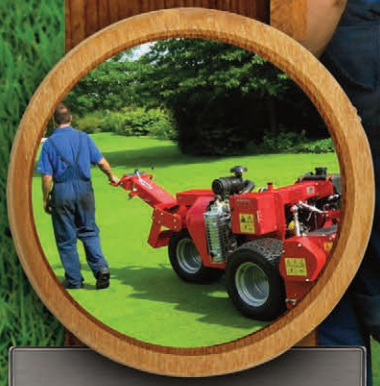

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A FIELD TO BRAGG ABOUT

Eric Schroder
Editorial Director
Eschroder@epgmediallc.com
763-383-4458

Last month, to celebrate the Fourth of July and honor America's military men and women, Major League Baseball played an official game at Fort Bragg in North Carolina. Fort Bragg is the largest military base in the US with a population of nearly 250,000 of which more than 53,000 are active military.

The game between the Miami Marlins and Atlanta Braves was put on by MLB and the MLB Players Association; it was a first, because no pro sports game had ever before been hosted at a US military installation. The project cost an estimated $5 million.

MLB field consultant and former STMA president Murray Cook and company had just 4 months to create a major league field and put a 12,500-person stadium around it on what had been an abandoned golf course. "We had extremely aggressive schedule," Cook says, "we had to clear the site, re-grade, put in drainage; we started building the field itself in the first week of April and we finished sodding June 1."

The field will remain for use by the armed forces for baseball or softball games, but all the seats were temporary and removed after the game. The lighting, which will met all the MLB specifications and standards, was temporary as well. All tickets were free and given out exclusively to military personnel and their families.

The final product was a field that Players Association executive director Tony Clark told reporters, "Looks like it's been here forever." MLB Commissioner Rob Manfred said in a news conference, "When I got here and saw it for the first time in person, I have to say I was just blown away by the quality of the field itself. The playing surface, the quality of the scoreboard, just the overall feel of the facility was really beyond what I expected."

Cook says the project serves as a prototype of how you can build a quality field in a short amount of time. "It means you can take the game of baseball anywhere," he says.

He adds, "The coolest part of the whole thing was training our all-military tarp crew over the last 2 weeks before the game."

According to the website SB Nation, "the all-military crew was able to get the 22,500-square foot tarp down in 1 minute and 25 seconds during practice. That beats the fastest crews MLB field consultant Murray Cook has overseen by a wide margin. [Cook said] I was telling them, when I was in Cuba the guys got it down to about just 2 minutes and 10 seconds. And then I go, the guys in Puerto Rico, they got it down to 2 minutes."

Fort Bragg got it down to a minute 25 seconds in just 4 days.

Cook says he "knocked on some doors" to get products for the field, mentioning Grant McKnight of Natural Sand (clay products), Chad Price of Carolina Green (sod), Turface (conditioner), and Revels Turf & Tractor (John Deere machines), all STMA members, among other commercial entities.

Other STMA members recruited to help build the field and prepare it for the game included Cindy Unger, Chad Kropff, Chris Ball, Zach Severns. ST

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FLSA'S IMPACT ON SPORTS TURF

Jeff Salmond, CSFM
jsalmond@ou.edu

The Fair Labor Standards Act (FLSA) was established in 1938. It introduced the 40-hour work week, established a national minimum wage, guaranteed time-and-a-half for overtime in certain jobs, and prohibited most employment of minors in "oppressive child labor" (U.S. Department of Labor (DOL).

Over the years, FLSA has been amended. The DOL last year proclaimed there would be changes to FLSA, raising the salary threshold required to qualify for exemption from overtime to $47,476 per year — an increase from $23,660 per year. These new regulations take effect December 1. This means that if you earn under the salary threshold and are exempt, you are eligible to be put on an hourly wage and able to receive overtime. The number of employees entitled to overtime will increase significantly.

This change is likely to have a substantial impact on employers, too. Due to the increased cost of overtime labor, employers may need to reevaluate staffing levels to limit overtime. Employers should be tracking employee work hours to ensure that recordkeeping requirements are satisfied. Employers should have already completed a review of exempt classifications under these new rules. It is not too late for employers to get job descriptions updated and make sure positions have been properly classified according to the new regulations. This is a large undertaking, and planning for the process should start now or already be in implementation.

What does this mean for those in the sports turf industry and sports in general? How will this affect minor league baseball and college athletics? Current salaried employees who make under $47,476, and work more than 40 hours per week to make fields safe and playable, get paid for only 40 hours. How will employers ensure that these vital tasks are completed if employees are restricted to a 40-hour workweek with no or limited overtime? Will employers hire more employees to fill the gaps? Will administrations budget more appropriately to compensate? For current hourly employees, will employers let them continue to receive overtime now that others in the organization may be hourly? If not, how will hourly employees survive on just their hourly rate? In the turfgrass industry, many employees are hourly, and customary overtime to get the job done plays a significant role in field playability and performance expectations.

These are questions that could pose a potential threat to the sports turf and sports industries. In a market that is seeing a decrease in young people coming into the profession, how will entry-level jobs be viewed, especially if an hourly employee is not allowed to supplement their salary with a healthy amount of overtime? It is possible that many may leave their jobs because they can't afford to work at their hourly rate.

In our industry, we may have become our own worst enemy. We do whatever it takes to get the job done. And, as FLSA forces change, I predict we'll continue to do more with less to keep our fields safe and playable because that is who we are. ST

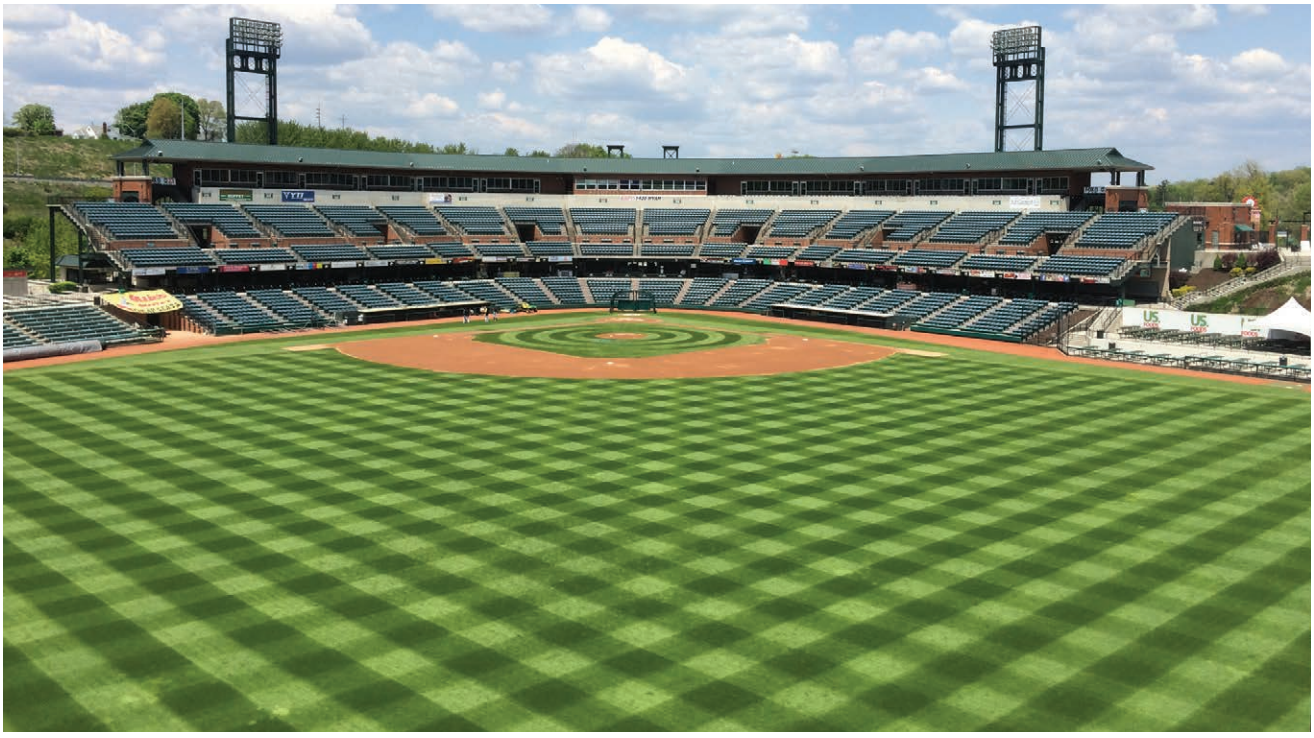


PHOTO COURTESY OF BEN YOUNG, FORMERLY OF ALTOONA CURVE

TIPS FOR BEGINNING SPORTS TURF MANAGERS

Editor's note: We asked some veteran Sports Turf Management Association members for some tips they would pass along to turf managers who are just beginning their careers. Here's what they said:

Don't be afraid to try new things, whether it is new technology or new maintenance practices. Just because something has never been done, doesn't mean it won't work.

You must learn how to expand your knowledge and experiences. Reaching out to others in the industry will make you become a better turf manager and help you reach your ultimate career goals. Networking is one of the most influential factors to success.

Weston Appelfeller, CSFM

For the sports turf manager entering the industry, I think it's important to be able to **be mobile**. Do not try to work in just one region. It's tough especially at the professional level to find that one position for your favorite home team. Be willing to relocate and gain as much knowledge as you can in different climates, situations, and facilities to make yourself more marketable.

Tony Leonard

Key to success in my opinion:

Be impeccable with your word; if something you promised can't be accomplished do not let it be due to a lack of trying.

If you close a field, always perform a maintenance task. Nobody likes to hear "the field needs to rest." It can rest after you have aerated, fertilized, made a pesticide application or done a deep watering to flush the system.

Soil and tissue testing are powerful tools.

Having a 12-month maintenance plan/schedule is a necessity.

And the most important — schedule everything in advance, as far in advance as possible, and assume that equipment will break down and weather will not cooperate, so always have a backup plan.

Ron Hostick, CSFM

Pay attention to detail in every aspect of your job. Keeping small things from becoming major issues will help you sleep at night.

Document everything.

Network with the folks who have years of experience.

Kevin Yeiser

#1-Use your peers to help, most often they have been in a similar situation and most are willing to help. No matter how much education you have real life experience is worth its weight in gold.

#2-Realize you don't know everything and be honest with yourself and those you serve and work with.

#3-Take time to smell the flowers. It is not always about the work or the job; balance your work with personal life and family and you will naturally succeed.

Jim Cornelius, CSFM

#1-Work hard, play hard, and be nice to people. You are always being evaluated and a current co-worker or intern may be in a completely different role in the industry in the future.

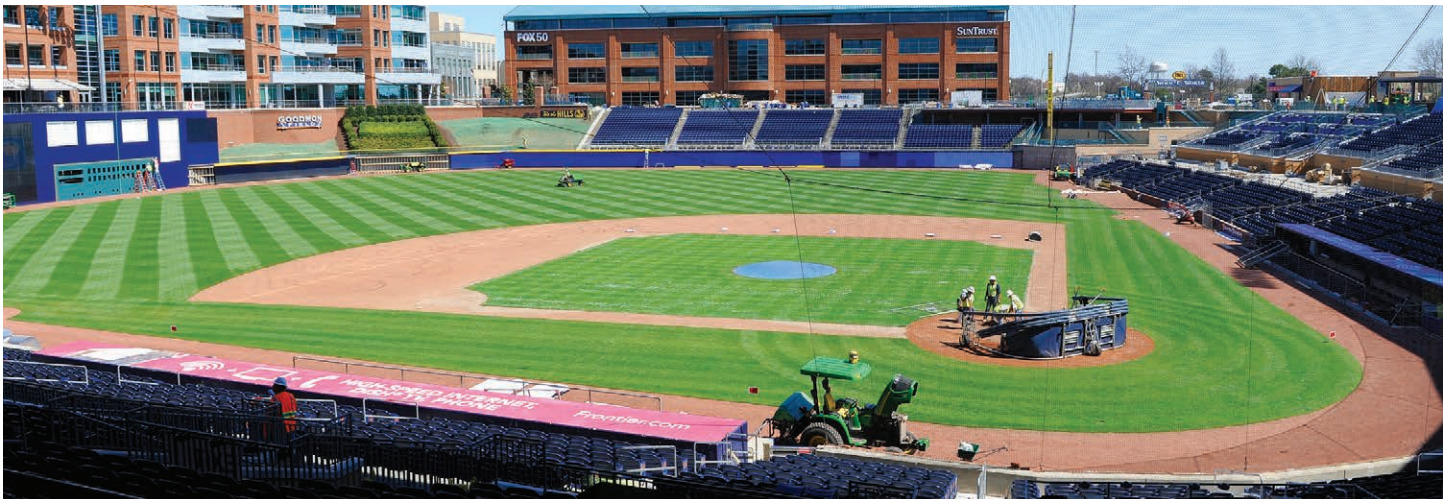
#2-Everything in life is political and decisions are often made through the view of a "best interest of the business" lens.

#3-Observe how current decisions are being made and consider how you would/would not make the same decisions in the future.

Jamie Mehringer

I think the one thing has benefitted me greatly in my career has been **networking**. It sounds cliché, and you hear people say it all the time, but you really cannot underestimate how important relationships can be in this small industry. Everyone is within reach of any contact seemingly by one person. If you want to go intern for a certain team in your area make phone calls ahead of time and be proactive in that pursuit. Ask your professor if he knows the head groundskeeper or has his phone number; I am willing to bet he does. I am fortunate enough each year to help with our senior turf classes at Oklahoma State University and the only advice I give to turfgrass students is to do an internship every summer and keep in touch with former employers as much as you can. They hold the key to your future, good or bad.

I was fortunate to get the job here at OSU because my former boss, Kris Harris, turned the job down but thought enough of me as an assistant to recommend me for it. The only reason I got a job at Georgia Tech beforehand as an assistant was because Kris thought a lot of Mike Boekholder and Greg Elliott, whom I worked for previously as an intern. We have been fortunate here at Oklahoma State to grow our department



substantially in my 8 years. All of my hires for assistants have come at the urging of friends in the industry. It is an easy decision when one of your friends says to you, "Hey I have a guy here who is about to graduate or has just finished his internship and would be an excellent worker for you there." Keep your friends close to you; work hard when no one is watching, and be the best employee/student every single day.

Todd Tribble

The best advice that I could give to a sports turf manager just starting out is learn, achieve, **have a positive attitude**, and work hard.

If you are currently in school, just graduated, or started out in the work force continue to learn and grow. The fundamentals of turf management are taught in the classroom and through books to give you a good foundation. In the work world this foundation is practiced and honed into skills. A lot of turf management is learned on the job or from experience. Every task that you are assigned is a chance to master your skills. Network and talk with other sports managers, ask lots of questions, and learn from their experience to help you hone your skills. Learn, learn, learn.

Evaluate yourself and see what you need to work on. Find out what your strengths and weakness are. Develop these strengths and work on improving your weaknesses. Set short-term and long-term goals for yourself. Short-term goals give you something to work for in the near future. These goals should align with your long-term goals. Long-term goals are for where you want to be in your career 5 to 10 years from now. Goals help to better yourself and facility. Believe in yourself and you will achieve your goals.

Having a positive attitude makes work easier. A lot of work goes into the maintenance of a facility that is often unnoticed or noticed but nothing is said. Some of this work may seem monotonous, but still needs to be done. Being positive and having fun can be infectious to all around you, making for a better work atmosphere for co-workers and player/fan experiences. Attitude is a little thing that makes a big difference.

Sports turf management is hard work. Work ethic is not something that is learned, but is developed. During the sports season/growing season show up to work early and prepare to stay late. Most sporting events occur on weekends or holidays. Don't be afraid to get dirty and put in the extra effort. Good things happen to those who work hard.

Scott Stevens, CSFM

#1-Bring the passion for the industry.

#2-Never stop learning or experimenting. Learn from your elders (we will share), take what you learn and try new things. Get involved with STMA; [our members are] the best in the industry to learn from.

#3-Understand the organization you are with, especially budgeting, expectations and goals.

Mike Tarantino, CSFM

Read and never stop learning. Work on improving yourself more than improving others.

Listen, adapt and let people know how much they matter.

Ask before giving feedback. Do not wait to give feedback. Adopt a process that goes above and beyond the often-required annual review.

Share the load, delegate. Trust your people with something you typically do yourself.

Mark Frever, CSFM, CEFM

#1-Use the knowledge you have learned to this point and build upon it exponentially.

#2-Learn from those that have "been there and done that" to master the craft.

#3-Don't act like you know it all because you don't. Even us old guys learn something new every day and you will too.

#4-ALWAYS work as a team just like the athletes taking the

field. You can't win by yourself.

#5-At times I lean on the team to get the job done. At times they lean on me to make sure they get the support.

#6-Pay attention to your surroundings and adapt to the situation. Adaptation is key to being successful.

Bruce Suddeth

I believe it's important to **maintain a passion** for our chosen career and enjoy coming to work each day. However, meeting our own self-prescribed expectations can sometimes be more difficult than anything else. Do not burn yourself out working too much; there are many great jobs within our industry that do not require 80+ hour workweeks.

Ask others and network about any problematic situation that may arise; someone else has likely been through it. Additionally, establish good and open lines of communication at work and at home. Lastly, appreciate everyone around you.

Noel T. Brusius, CSFM

Learn early that it is better to out-think problems than out-work problems. In our younger days it is natural to have the mindset that if something is wrong you can stay up all night and fix it. Sometimes this turns into a habit and regular practice when it is usually unnecessary. Emergencies will happen, but learn anticipation and think things through before falling back on the energy of youth.

You can learn something from anyone at any time. I have been doing this for over 20 years and I learn things from interns or seasonal employees all the time. Don't fall into the trap of becoming an intellectual snob just because you have a degree or have been around a while. If you do, you will be cutting off a world of resources.

Patrick Coakley, CSFM

Find a mentor. Be respectful of their time, be a sponge, take what they are able to share and don't forget to pay it forward.

Become a professional within your workplace. Don't expect to start "at the top." Work your way into more responsibility. Put in the time necessary to "build your experiential resume."

Network with peers at your level who share the same challenges, opportunities and desire to grow. But also hang out with people who are in the position you would like to have someday.

Never stop learning. Don't get stuck in a rut, doing things the same way over and over. Try new things. Find and embrace your "inner mad-scientist."

Accept change! Adjust to change and use it to your advantage.

Learn new skills that will make you more marketable and will add value to your proposition.

Be consciously aware of your inner-critic, but don't listen to it. Become comfortable being uncomfortable.

Trust in God, but lock your car.

Joe Churchill ST

BRIDGING THE GAP: VENDORS AS PARTNERS

BY KEVIN SCOTT MERCER, CSFM, CGM, LIC

Doing more with less is not even a catch phrase any more; it's a normal part of our daily routine at work. With no added resources and more demands forced upon us, we still manage to give every bit of ourselves with budgets underfunded and working long hours from being understaffed. Why do we give so much of our time and dedication for our fields? It can't be put into words; it's more of a feeling when the fans are standing in the bleachers holding their hats over their hearts during the National Anthem, as they look downward at the perfectly manicured and striped turfgrass field. We get a great sense of pride at producing a world-class facility, whether it is a professional field or a city ballpark.

Some of you might have a crew that you can lean on but some of you do not, however you are still willing to put in the long hours to get the outstanding results from the fruits of your labor. My dad always told me as a kid to work smarter, not harder, but never compromise the end result by taking shortcuts. The demand for sports field safety is steadily increasing and that is a good thing for our industry, but the world hasn't caught up yet to the demands or the comprehension of this important facet. The reality of it will eventually catch up, probably sooner rather than later.

Recently I have been thinking a lot about the changes within our industry and one of those changes has been the customer and vendor relationship. What was then and what is now could be as a result of the 2008 recession or even social media, but I feel compelled to give a shout out to the commercial member of the Sports Turf Managers Association to say thanks for all they do for us, and the STMA.

Once upon a time a salesperson would visit the turf manager's office and perhaps talk about new products that are out or push discounted items below the market price hoping to land more of their competitor's business. There is nothing wrong with this approach but some turf managers might make a salesperson earn their business. This is where it is getting more and more competitive and it should be. Everyone is fighting over your budget dollars these days, but are the vendors doing everything they should to earn it?

Your current sales representative might have already earned your trust and loyalty, but is he/she really helping you with time management or are they burning more time by your having to manage them? Review these questions to

see if any of these situations might apply to you. If you answer "yes" to more than two of these questions, perhaps your time is not being well spent. Are you:

■ Checking orders and deliveries to make sure they are correct?

■ Confirming the pricing is correct?

■ Having to stop work on your fields because a sales person shows up unannounced?

■ Answering a phone call weekly in growing season from a vendor's company driver to get directions to deliver supplies to your shop?

VENDORS

When a new turf manager takes on a new job and is new to the area, he or she is likely to be swamped with sales people bragging about how their products are better than the products presently in your program. Most sales people on the first visit are typically fishing for the turf manager's agronomy plan or equipment needs, but why not come with a plan with insight into the property challenges the turf manager may have before you meet him?

Being proactive and helping the turf manager as an assistant and not as a

sales person can go a long way toward building customer relationships. If I could offer any advice to the salesperson it would be to embrace this classic line from the movie "Jerry Maguire": "I am out here for you. You don't know what it's like to be ME out here for YOU. It is an up-at-dawn, pride-swallowing siege that I will never fully tell you about, okay? Help me help you. Help me, help you."

Having a reasonable customer base without running yourself thin might be better than working hard to obtain too many customers, then subsequently losing a few of your good ones due to insufficient attention. In other words, don't take on too much trying to satisfy a bunch of people, because it could leave you way short by disappointing your loyal customers.

When a sports turf manager starts a new job, the administration will typically show support by purchasing new equipment or increasing the budget for additional labor and materials if a well thought-out plan is developed. I call this the "honeymoon period." I like to call it this because typically it's only for a short time. This may last for about a year or two and then, you guessed it, the honeymoon is over. To come with a plan is to come prepared and to develop a plan with the turf manager will take a bit of research that your company might already have.

The STMA categorizes sports fields into four different categories: College and Universities, K-12, Professional and Parks & Recreation. For commercial members that belong to the STMA, this information is currently available on the website, www.stma.org.

FEEL, FELT AND FOUND

The three F's scenario (feel, felt and found) is a common tool venders use to gain customer trust and, consequently, earn the business. I have some ideas I would like to share with the vendors and while I am no means an expert I thought I would offer a bit of insight for a young salesperson. Before arriving to a meeting with a new customer do your homework, and then build a preliminary strategy plan based on the 3 F's:

Feel: Today's turf managers are stressed with issues on and off the field for items like budgeting, environmental issues, project management, human resources and of course the safety and function of their sports fields. The sales person should have a "feel" for all the current challenges facing the customer. This knowledge will help to prepare you before you walk in the door.

Felt: Empathize and voice support for the new client's undertaking. The young today are smart and very tech savvy; they don't have time to waste, so make every second count with your plan and make it comprehensive with all the steps to meet the challenges and issues.

Found: Now you are ready to deliver your plan. Present the basic plan in less than 10 minutes if possible and encourage feedback from the customer.

As you form your working relationship, remember to make your customer's job as easy as possible and consider other ways

that you might build your relationship together. Understanding the job from the customer's perspective is critical. Start by:

- Understanding the facility problem beforehand is key to figuring operational costs. Determine how far the dollar will go with a strategic plan using these ideas to aid in the customer budget and equipment purchasing forecasting: level of service or expectation; size of staff vis a vis realistic goals per acre; and prioritizing a facility's needs/deficiencies and a plan to assist.
- Working with your customer to help identify potential savings on supply costs, equipment costs, labor efficiencies. Help your customer to sell their program successfully to senior management.
- Helping the turf manager's crew on a small task and showing them they are appreciated by buying them lunch or giving them your company hats or shirts.
- Lessen the stress load of the job and take the sports turf manager and his/her spouse out to dinner or a sporting event, etc.

I have no experience as a vendor and I have a lot of respect for them all. In fact, a few STMA Commercial Members have become dear friends of mine. I think what is great about the STMA and why we continue to grow is because of its members and how we showcase our respect for one another. It's how we help each other out. Let's not lose sight of the Commercial members' support over the years to help the STMA grow and help us raise the bar for excellence. The STMA mission statement says, "STMA advances professionalism in sports field management and safety through education, awareness programs, and industry development." Let's give back to our Commercial members by simply letting them help us. ST

Kevin Scott Mercer CSFM, CGM & LICM, is manager of grounds, facilities services and campus safety for The Lawrenceville School, Lawrenceville, NJ.

John Mascaro's Photo Quiz

Answer on page 19

John Mascaro is President of Turf-Tec International

Can you identify this sports turf problem?

Problem: Thin and dead grass on left with one brown stripe near foul line

Turfgrass area: County PONY baseball field

Location: Bloomington, Illinois

Grass variety: Tall fescue blend

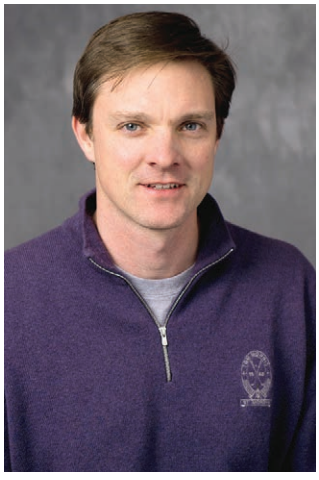
BACKGROUND ILLUSTRATION COURTESY OF ISTOCKPHOTO.COM

THE SPORTSTURF INTERVIEW: DR. CALE BIGELOW, PURDUE UNIVERSITY

This month in "The *SportsTurf* Interview," we feature Cale A. Bigelow, PhD, Professor-Department of Horticulture and Landscape Architecture, Turf Science and Management, Purdue University. Cale says, "The purpose of my research program is to provide practical information that enables turf managers of all abilities to grow the highest quality turf using the fewest management inputs (e.g. mowing, fertilization, irrigation and pesticides). This is being accomplished by emphasizing adapted turfgrass species and cultivar selection, proper establishment methods and employing sound cultural practices with an emphasis on soil fertility and nutrient management related issues."

SPORTSTURF: What topics are you conducting research on currently?

Bigelow: Lots of good stuff! Species and cultivar selection/persistence are always at the forefront of what we are doing. In addition the work into drought-related projects is "mushrooming"! Lots of good stuff about to happen there. Lastly, the whole area of alternative products and using biologicals for turf care is a strong current focus.



ST: What do you see as the biggest challenges moving forward in turfgrass research?

Bigelow: [Money] for applied/practical projects that benefit our field managers. There simply is not enough money outside of the large projects at a select few universities. But we do the best we can.

ST: How do you attract students to your turfgrass program?

Bigelow: Much of it is word of mouth. I use social media bit and get a few things via that stream, but our alums are a big help too. The problem though is getting the students an opportunity to experience the hands-on "work" in the summers during high school. Students have a great deal of competing commitments to become "elite" (pick your sport or activity). No time to work when you are at camps or training.

ST: Has social media impacted your work in any way?

Bigelow: I love it, SM keeps me connected with the newest trends but also our industry.

ST: How do you think the profession and industry will change in the next 10 years?

Bigelow: Hopefully we will have turf managers that even more technically competent and able to deliver a quality/safe product with the fewest inputs needed. I am excited for these young people and what they will deliver to the table. My hope is that these "professionals" are actually fairly compensated for their education and efforts. That is a real challenge to retention in our industry.

ST: How do you think the natural turf vs. synthetic turf issue will play out over the next decade?

Bigelow: There will always be a place for both. Climate, intensity of use and user expectations all drive this. Hopefully we will have a better understanding of the risks on both sides. Plain and simple we want our athletes particularly the younger ones to have the safest fields, period!

ST: How has your career benefitted from being a member of STMA?

Bigelow: Tremendous networking opportunities. I love staying in touch with former students, new and old turf nerd friends and also the ability to see what is new and solutions to practical problems in our industry.

Plain and simple we want our athletes particularly the younger ones to have the safest fields, period!

ST: What are your passions and interests outside of work?

Bigelow: I know it's a bit cliche but I am really focused on my family and making sure the two young people in my house get launched into the world to make it a better place than it is today. Not exactly sure what they will end up doing for a career but as long as they contribute as citizens with an attitude that is not "All about me!" I'm good with that. In addition, we have two yellow Labradors (age 2-4) that take a bit of time to keep them properly exercised. Beyond that I enjoy tinkering with some DIY home projects and traveling to warm places that involve sandy beaches when I get a chance. ST

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Sources: Centers for Disease Control and Prevention (www.cdc.gov) & The American Academy of Orthopaedic Surgeons (www.aaos.org)

FROM THE SPORTS TURF MANAGERS ASSOCIATION HISTORICAL ARCHIVES:

It is a good thing that sand spreading practices and equipment has evolved!

John Mascaro's Photo Quiz

Answers from page 15

John Mascaro is President of Turf-Tec International

This thin and dead grass to the right of the first base foul line on this PONY Baseball field is the result of a flood. Even though Bloomington is located 38 miles from the closest major river, the flash flooding that occurred in June 2015 were still no match for this park. They had a series of two major rain events in a row. One left the park under water for more than 2 weeks and in the above photos, the park was underwater for another 3 days. Interestingly enough the dead turf to the right of the first base foul line is not a result of the flood. As it turns out, the Sports Turf Manager originally was just going to replace right field to center field so they made one pass with glyphosate. However, after examining the silt and debris left behind after the floodwaters receded, it was determined that it would be better to kill the entire outfield. They removed some of the silt that was left behind after the flood, re-graded the field and surrounding areas to help with drainage then reseeded with a short growth Kentucky bluegrass variety.

Photos submitted by Andy Ommen, Head Groundskeeper at McLean County PONY Baseball in Bloomington, Illinois.

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.

BACKGROUND ILLUSTRATION COURTESY OF ISTOCKPHOTO.COM

THE 5 COMMANDMENTS OF SUSTAINABLE SPORTS TURF MANAGEMENT

BY **MARTIN KAUFMAN, CSFM**

Sustainability has become a trendy word used by the media and politicians as our society has become more familiar with terrorism, recessions, and environmentalism. I actually like this word as I feel like it embodies practices that I grew up with on the farm in the Midwest. Hard work (effort), ingenuity (recycling), coupled with science and math usually won the day. My Dad grew up on a dairy farm and earned his agronomy degree from The Ohio State University. I remember helping him plant corn and soybeans with endophyte-coated seed. Soybeans were new and no-till planting was fairly new. As I learned the basics and experienced the difference in how my Dad did things and how my Grandfather did things, I started to realize *there is more than one way to do it; however some basic priorities still prevail*.

Here are some prioritizations I have developed as I try to share with customers some practices available for use when they choose to distribute their resources. As you may be aware there are many forms of a particular cultural practice and diversification is usually best. When it comes to building a maintenance program for your athletic field, that is soundly supported year after year, I believe these five commandments are stated in sequencing priority order, one being the most important and five being the least. All practices are important; however to maximize return on investment (ROI) the investment in the first dictates significance of ROI from the second and so on. Many times I see significant investments made in priorities four and five with a poor ROI because there is a paltry investment in priorities one, two and three. Another way to look at this recommendation may be in the form of goal setting.

1. Consistent mowing
2. Monthly aerification (any form)
3. Monthly fertilization (annual soil test)
4. Monthly consider weed/pest control
5. Consider topdressing/thatch control

You may have noticed I did not mention irrigation, a specific kind of mower or aerifier nor did I mention a specific kind of fertilizer, chemical or thatch controlling device. I will use the remainder of this article to define some of the thoughts behind these prioritizations as well as define what they are intended to portray.

CONSISTENT MOWING

What does consistent mowing mean? Mowing no more than 1/3 of the leaf blade off, mowing often enough to keep the 1/3 rule, mowing with sharp blades at a slow enough ground speed so as to actually cut the leaf rather than tear or rip it. Mowing with four different rotating patterns. Mowing as high a height as tolerable and understanding that mowing manages sunlight and photosynthesis. To quote from the book, *Sports Fields 2nd edition* by James Puhalla, Jeffrey Krans, and J. Michael Goatley Jr.: "…a turf that is neglected several months at a time cannot be brought to peak playing conditions by one or two low-height mowings just before the season starts."

One of the sayings I have found myself passing along is that "if we succeed or fail today it is not because we succeeded or failed today, it is because we succeeded or fail 3 to 6 months ago." So what does consistent mowing provide? Relief when things don't go as planned (skipping a mowing). Healthy turf when clean cut rather than ripped (less stress). Increased density for safety, looks, wear tolerance, and playability. Reduction in weeds, diseases, and pest problems. Increased soil microbial activity and nutrients available (soil biology and health). Survival of environmental extremes or stresses like drought, flooding, heavy traffic, constant traffic, heat or cold.

MONTHLY AERIFICATION

Why entertain a goal of monthly aerification? What does aerification actually do? Create pore space in the soil. Why is pore space important? A healthy soil has 50% pore space and 50% elements, plant parts and debris or organic matter; 50% of the pore space should contain water while the other 50% contains air. When traffic and standing water compact the elements, plant parts and debris or organic matter, pore space is reduced or eliminated which reduces or eliminates the field holding capacity (storage ability) for water and air. What happens when there is no water and/or oxygen in the soil? Limited or no plant respiration! What is respiration and why do we care? Respiration is conversion of carbohydrates to ATP (adenosine triphosphate). What else makes ATP? Photosynthesis. Why are photosynthesis and respiration important? Energy conversions for energy utilization. No photosynthesis or no respiration means no energy and death will result!

Time for another quote from *Sports Fields*: "…seek first the health of the turf and its enfolding culture, and all the rest (playability, economy, aesthetics) will be added onto it."

The Soil Food Web, a sustainable cycle that begins and ends with "dead material" that is used by microbiology to store, release and manage chemistry. Ever heard of lichen, bacteria, fungi, protozoa, nematodes, and mites? Soil organisms that make nitrogen available to plants are predators of fungi or bacteria. The interaction of bacteria and their predators and fungi and their predators produce as much as 80% of the plant available nitrogen that occurs in the soil.

So how does fertilizer get into the plant anyway? Water solution. What do we know about some of our weeds and less desirable grasses? They don't require the same conditions as our preferred grasses do they? Many times these weeds and less desirable grasses do well with less pore space or oxygen. Why is that? When we converse about chemical elements in the soil we usually realize that ratio balance is as important as individual quantity. pH is usually affected by these ratios and sometimes the pore space as this may affect anaerobic and aerobic activity that does bind or solubilize elements thus restricting or making them available. Just as different plants prefer different pH they also thrive or struggle in different microbiological ratios. For instance finding fungi in the forest is not uncommon. Trees, particularly conifers, prefer a higher fungus to bacteria ratio. Weeds enjoy 100% bacteria or a low level of fungi to bacterial ratio. Desirable grasses and row crops tend to do well with a balanced ratio of fungi to bacteria.

The point is, mineralization only occurs because of biological processes. When biology is functioning properly, water and fertilization use is reduced and plant production is increased. Bacteria convert ammonium to nitrite and then to nitrate by removing hydrogen and then replacing it with oxygen. Nitrate does not exist in the soil without the soil microbiology

functioning. What do fungi do? Fungi retain and solubilize nutrients to the plant in exchange for protein sugars. Fungi actually create pore space for water and oxygen and compete with pathogens that may cause disease.

Why are Mowing and Aerification at the top of the list? Because these two cultural practices heavily influence biological processes more than any other cultural practice. Aerification can increase your field holding capacity for rain on non-irrigated fields or the pore space for oxygen on an over-irrigated field.

FERTILIZATION

Please consider the cost of a soil test versus the cost of any fertilizer product. Documenting the test results and interpretation of the soil samples annually creates a trend that can be used for sustainability in your maintenance program. I go to my physician once a year for a physical and blood test. That is what a soil test is for your turf. Diet, exercise and medicine are used to manage my health both acutely and long term. These cultural practices usually will dictate how sustainable my life is or how quickly I recover from stressful environmental conditions.

In turf I prefer the private labs with Mehlich III extraction methods on P2O5, categorization of Anions, Exchangeable Cations, Trace Elements and a Base Saturation percentage. However, I keep the formula ready to interpret the Extension Lab results from Mehlich 1 so I am looking at apples to apples so to speak. Pay attention to (PPM) parts per million and (lbs./A) pounds per acre. Many folks like to say "fertilizer is fertilizer" or "nitrogen is nitrogen." I would point out that paying attention to what else is in the bag or the tank has just as much if not more of an effect on the results. If there is something in the mix that the soil already has plenty of then you run the risk of pollution or triggering a chemical or biological process you didn't intend.

What is the salt index value of the material? What form of nitrogen or potassium is it? What percentages of sulfur, iron, magnesium or calcium are in the product as well? How does that influence your pH, elemental ratios and biological processes? 17-17-17 is inexpensive and the correct tool in many situations. However, take the time to take a look at what it really is: diammonium phosphate, urea, and muriate of potash. These are some of the higher valued salt index forms of nitrogen, phosphorus and particularly potassium. This does affect your soil chemistry and biological processes. Deficiencies must be corrected and elemental relationships maintained. This will allow the soil microbiology to do the work for you. It does matter if you use promag, sulpomag, high cal lime, dolomitic lime, or gypsum. Apply what the soil needs and not what it doesn't need for the crop you are sustaining.

WHAT ABOUT PEST MANAGEMENT?

Weeds, insects, diseases, people, equipment. Time for another quote: "Proper fertility, irrigation and cultural management decisions can greatly reduce the incidence of pests in athletic turf." I will add another quote I seem to use often, "just because you can doesn't me you should." Do you need that pesticide? Have you crossed the tolerable threshold of (IPM) Integrated Pest Management? Believe me, I use pesticides. However, using pesticides needs to be reserved for specific needs rather than cheap acute solutions. These herbicides, insecticides, fungicides, etc., have an influence on soil microbiology. How do you think pesticides are broken down any way? Microbiology. Which would you rather your soil microbiology be working on? Serving water and nutrients to your grass plant and breaking down organic matter or breaking down the latest pesticide applied? Remember a fungicide is most likely killing the good guys too.

TOPDRESSING AND THATCH CONTROL

This practice usually needs to be employed because you have invested so well in the previous four commandments. Strong healthy turf is going to produce thatch and invite pest issues such as disease and insects (no weeds though). Topdressing, dethatching, verticutting and slicing among other methods may assist microbiology in managing the successful ROI in sustainable cultural practices. I have seen many sports fields topdressed that are not being mowed consistently and certainly are not aerified frequently. The result is a beach volleyball court. You could argue verticutting be lumped in with consistent mowing and I wouldn't mind. Remember that each cultural practice has a purpose and is building on the investment made in the practice performed previously. ST

Martin Kaufman, CSFM, is the grounds and sports field manager for GCA Services Group.

ARE DISLODGEABLE PESTICIDE RESIDUES A CONCERN ON ATHLETIC FIELDS?

BY **TRAVIS W. GANNON, PHD AND MATTHEW D. JEFFRIES**

Athletic fields make up a significant sector of managed turfgrass, and are common throughout society with more than 700,000 fields in the US. Athletic fields must be managed properly to ensure a uniform playing surface and minimize potential athlete injuries. Much research has documented the detrimental effects of weed populations on the integrity of the playing surface; hence, it's imperative to effectively control weeds and preserve the playing surface.

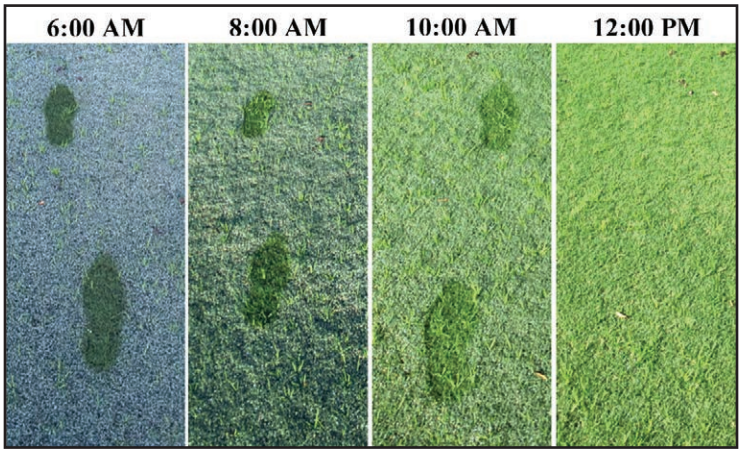
SYNTHETIC PESTICIDES

Synthetic pesticides are commonly used to control weeds and other pests in many facets of agriculture including specialty crops and noncropland areas such as athletic fields. Unlike many agricultural commodities that possess re-entry interval restrictions after pesticide applications, it's common and lawful to enter athletic fields and other turfgrass sites recently treated with pesticides in many US states. In such cases, it is permissible to re-enter a treated area after the application has dried. Currently, there is growing concern amid synthetic pesticide use and potential adverse effects on human and environmental health, which has caused some municipalities and local governments to ban pesticides on public properties including athletic fields. Some of the bans were adopted to reduce human pesticide exposure, while some were unfounded cases based solely on personal opinions. Specifically related to human health, routes of human pesticide exposure from treated athletic fields include dermal contact, nondietary ingestion, and inhalation. Dermal exposure accounts for most exposure on treated athletic fields and may be the result of direct contact with the playing surface (sliding, for example) or indirectly onto an object (balls, shoes, equipment, clothes, etc.) then transferred to humans.

Pesticides vary in the amount that is absorbed via dermal exposure and the amount absorbed varies for different parts of the body. Previous research indicates ~5-15% of a pesticide may be absorbed through the skin on hands and forearms, while up to 100% may be absorbed on genitals. Oral exposure may be the result of carelessness or accident and a common route includes eating, hand-mouth contact, smoking or other tobacco use, without washing hands after being in contact with a pesticide-treated area. Inhalation exposure is a result of breathing pesticide vapors, dust or spray particles and is more problematic for pesticide applicators than athletes.

DISLODGEABLE PESTICIDE RESIDUES

Because of the growing concern amid synthetic pesticide use and associated potential health effects, recent research efforts have focused on quantifying dislodgeable pesticide residues from athletic fields and to elucidate influential factors with an overarching goal of devising best management practices to minimize dislodgeable foliar residues. The amount of pesticide that may be dislodged or transferred to athletes depends on pesticide properties including water solubility, persistence, vapor pressure, and sorption coefficients, among others, with pesticides ranging widely in these properties. For example, 2,4-dimethylamine salt (2,4-D; many trade names) is a commonly used postemergent herbicide and has a very high aqueous solubility (796,000 mg/L) while oxadiazon (trade name Ronstar), a commonly used preemergent herbicide, has a very low aqueous solubility (0.7 mg/L). This, among other factors, inherently affects the fate of pesticides and specifically affects the amount that is potentially dislodged or transferred to athletes.



Amount of 2,4-D dislodged from a hybrid bermudagrass athletic field.					
	Days after treatment				
Time (EST)	1	2	3	6	12
	% dislodged of applied				
5:00	4.0	2.1	1.0	0.2	0
7:00	3.8	2.2	1.0	0.2	0
9:00	3.6	1.6	1.0	0.1	0
11:00	0.6	0.1	0.3	0	0
13:00	0.1	0.1	0.1	0	0
11.3 % of applied dislodged immediately after application.					
0.5 % of applied dislodged 1 hour after application.					

Other factors that affect dislodgeability include turf type, level of management, time between application and event, time within a day, mowing practices, clipping management, rainfall, sprayer setup (nozzles, carrier volume, etc.), among other factors. It's also important to note that pesticides range in their human-toxicological concerns and their effect on various human systems and organs.

How much 2,4-D is dislodged from a treated bermudagrass athletic field immediately after application? How much is dislodged in subsequent days? 2,4-D is a selective, postemergent broadleaf herbicide commonly used on athletic fields, golf courses, sod farms, home lawns, etc., that was originally registered in the US in 1946 and has been scrutinized in recent years for toxicological concerns. Further, 2,4-D has very high aqueous solubility, which indicates it may lend itself to readily dislodge from treated turfgrass foliage.

Recent research has quantified dislodgeable 2,4-D and other commonly used pesticide residues and investigated factors that affect pesticide dislodgeability. For example, the amount of 2,4-D dislodged from hybrid bermudagrass immediately and 1 hour after application and at 5:00, 7:00, 9:00, 11:00 and 13:00 EST on subsequent days after treatment was quantified.

Amount of 2,4-D dislodged is affected by time, atmospheric conditions, application equipment, and turfgrass species, among other parameters.

- 11.3% of applied was dislodged immediately after application while 0.5% was dislodged 1 hour after application
- Following application, 2,4-D dislodgeability decreased: (As days after treatment increased — 4 times more 2,4-D was dislodged at 5:00, 1 DAT (4.0% of the applied) than 5:00, 3 DAT (1.0% of the applied); at later sample times within a day — greater than 15 times more 2,4-D was dislodged at 9:00 compared to 13:00 within 5 days of application
- As relative humidity decreased
- As leaf wetness decreased
- As spray droplet size increased
- As carrier volume increased

Summary and best management practices to reduce exposure. When discussing this and related research, the most common question is, "How long do athletes, pets, etc. need to stay off the grass after a pesticide is applied?" As alluded to earlier, this is a very difficult question to answer and there is no simple or "one size fits all" answer as it varies widely with the type of turf, time of year, pesticide applied, etc. 2,4-D was dislodged through 5-7 days after treatment indicating athletic field managers and event schedulers should coordinate

pesticide applications to minimize human exposure for at least this duration (it should be noted that many compounds persist longer than 2,4-D on turf foliage and associated implications should be recognized).

Further, research indicates athletic fields can be used safely in the afternoons soon after application but caution should be used if scheduling events during the morning or evening (when canopy moisture may be present) on days soon after a pesticide application. Another effective best management practice to reduce human pesticide exposure is to irrigate soon after a pesticide application. Turf managers should ensure this won't compromise efficacy, but this is a very effective and viable option for many pesticides (even herbicides including 2,4-D and sulfonylureas).

FUTURE OF PESTICIDE USE ON FIELDS?

This is an excellent question and also a difficult one to answer. In certain locales, municipalities have banned the use of synthetic pesticides on cosmetic turf in public areas including athletic fields. It's unlikely this will be adopted on a large scale in the near future but athletic field managers should be cognizant of the fact that this phenomenon is occurring. Future research should assess dislodgeability of other pesticides and further characterize best management practices to minimize human-pesticide exposure to preserve their use as it becomes more difficult and costly to register new products and reregister existing pesticides.

In short, dislodgeable pesticide residues can be problematic on athletic fields but with coordination and effort between field managers and event coordinators, exposure and associated risks can be minimized. Further, clear communication among field managers, event coordinators, athletes, and parents is crucial for understanding the necessity of synthetic pesticide applications and implementing appropriate measures to manage risks. ST

Travis W. Gannon, PhD is an assistant professor in the Department of Crop Science at North Carolina State University. Matt Jeffries is a graduate research technician in the turfgrass research group at North Carolina State. His dissertation project focuses on off-target pesticide transport processes in turfgrass and riparian systems.

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Figure 1. Example of various colorant formulations and their 'shades of green' in the bottle. Remember that the color in the container does not always represent the color after it's applied to turfgrass, especially if the turf is dormant or approaching dormancy. PHOTO COURTESY OF JIM BAIRD, UC RIVERSIDE.

Figure 2. Application of various colorants (paints and pigments) applied to concrete. Cleaning is advised, however you can see that photodecomposition occurs. Compare the picture on the above (2 Dec) with that one below (17 Dec) – applications made three (3) weeks apart. PHOTOS COURTESY OF JIM BAIRD, UC RIVERSIDE.

TO PAINT OR NOT TO PAINT? COLORANT BASICS FOR ATHLETIC FIELDS

BY **GORDON KAUFFMAN III, PHD**

Editor's note: *The author is Technical Manager-Turf and Ornamental, for BRANDT/Grigg Brothers, and a member of the Sports Turf Managers Association.*

Colorant use by turfgrass mangers has increased over the past 5-10 years. By no means does artificially coloring or painting athletic fields serve as a substitute for sound agronomic practices, including timely and correct nutrient inputs, cultivation, soil amendment, and pest control. However, as we learn more about colorant uses and benefits, sports turf managers are now able to quickly and efficiently mask blemishes, color dormant and semi-dormant turf, positively affect plant health, improve aesthetics for higher profile games/events, and perhaps even increase germination time and establishment.

One important thing to keep in mind: turfgrass "color" remains a very subjective assessment and many formulation options are available in the marketplace offering different "shades" of green (Figure 1). For more detailed information about specific colorant performance, colors and observations when applied to

bermudagrass, see the August 2014 issue of *SportsTurf* pages 20-22, "Green sports fields using turf colorants."

Let's start with the basics, consider a practical guide to using colorants at your facility, and then review some of the current science pertaining to colorant use and benefits.

FORMULATION DIFFERENCES

Colorants come in three basic formulations: pigments, paints, and dyes. Sports turf managers can use colorants for a specific agronomic objective or simply paint actively growing, semi dormant, or dormant turf. Pigments, paints and dyes are similar chemically in that they all contain compounds that produce a specific and desired color; however they differ physically, thus the aforementioned classification. Inert ingredients, or what makes up the final physical formulation, determine its use.

PIGMENTS

Colorants designed for repeated and regular use and applied with tank mix partners such as plant growth regulators or crop protectants. Use pigments as part of a complete agronomic program. Pigmented products come in different color options and are generally fortified with additional compounds designed to improve plant health, such as those that block potentially harmful ultraviolet (UV) light (see "Impact of colorants on plant health" section page 30).Features, benefits, and limitations include:

- Low viscosity and metal load, lower weight
- Designed for repeated use and to promote plant health
- Increased reflectance of potentially damaging near infrared light (NIR)
- Formulations/use rates/timings designed to filter more photosynthetic light for absorption and reflect potentially harmful light (see "Impact of colorants on plant health" section below for more information).

PAINTS

Specifically formulated colorants for sports turf surfaces, paints dry fast and provide a natural green, durable and long lasting color. Durability means paints stand up to traffic and do not rub off on uniforms (see dry time data below). Paints often require agitation, due to the viscosity produced by the binder, and are not as compatible with tank mix partners. Apply paints infrequently to semi-dormant or dormant turf.

Features, benefits and limitations include:

- High viscosity and metal load, higher weight
- Adjuvants that promote 'stickiness' and durability for infrequent use (up to 75 days)
- Corrosive risk to spray equipment and may cause pump seals to leak
- Avoid overlap spray onto non-turf surfaces such as metal, concrete, asphalt, or brick/stone. The more porous the surface, the more susceptible it is to staining (see Figure 2).

Often colorant manufacturers sell cleaners designed remove staining from various surfaces, including spray equipment. Consult with product label(s) for complete cleaning instructions.

DYES

Water soluble and natural coloring agent designed as a spray pattern indicator. Dyes offer little in the way of long-lasting color and durability.

FACTORS TO CONSIDER

Colorant rates, uniformity, effective color, and longevity will be determined by the following primary factors:

- Turfgrass species
- Stage of turfgrass growth
- Water carrier volume
- Height of cut
- Colorant formulation (inert ingredients)

Turfgrass species. In general, warm-season grasses such as bermudagrass and zoysiagrass will require higher rates of the same colorant. (*Note: Read label instructions carefully. Extent of pigment concentration has the biggest effect on*

rates, indicated on the label use instructions. Very often, labels recommend a range of rates. The recommendations listed here provide examples of when one might apply low or higher rates.)

This includes actively growing, semi-dormant and dormant turfgrasses.

Stage of growth. Dormant and semi-dormant turfgrasses require higher rates of the same colorant. Always test a small area before applying to dormant turfgrass. I recommend applying pigments, and even paints, to semi-dormant turfgrass, rather than plants that have reached dormancy (see 'Are Colorants Absorbed by Leaf Tissue?' page 30 for more information). In our experience this approach produces a better color *at lower rates* and requires *fewer* subsequent applications during the dormancy period.

Water carrier. We found that colorants perform the best at a wide range of water volumes anywhere from 88 to 150 gallons per acre (GPA). Research as shown, however, that turf color and longevity will increase by using higher water carrier volumes– up to 160 GPA.

Height of cut. Regardless of species, cultivar, or hybrid, grass mowed higher will require higher rates of the same colorant. At the higher height of cut, more leaf surface area will require more material to achieve the same level of uniformity and ultimately, color.

Colorant formulation. Clearly, formulations differ in their concentration and inert ingredients, which determine optimum use rates.

ARE COLORANTS ABSORBED BY LEAF TISSUE?

The short answer is likely yes, but we cannot be entirely sure. Most currently believe colorants coat the leaf surface and remain there until being mowed off. However, anecdotal evidence and observation might suggest that pigments are, in fact, absorbed. For example:

- Excellent color can be maintained for 2-3 weeks after repeated mowing, depending upon rate.
- Different turf response was observed when colorants were applied to dormant and semi- dormant bermudagrass.

Based on our work, and I'll say it again, it's best to apply colorants before the turf is fully dormant, or straw-colored. Miller and Pinnix made a similar observation in 2014.

These observations suggest that if/when pigment formulations get into the plant, color longevity, use rate and application frequency are impacted. McCarty et al., 2013 argued that *paints are not absorbed* by leaf tissue, while *pigments are absorbed* through stomata. More research will help clarify this question and before we can make a firm conclusion about colorant absorption by turfgrass leaf tissue.

Will paint colorants rub off on players' uniforms during games? Based on our research and practically speaking, I think not. We tested the dry time of paint applied to Kentucky bluegrass under different atmospheric conditions and found that the dry time was very fast, no longer than 26 minutes.

IMPACT ON PLANT HEALTH

Colorants are often fortified with inert ingredients such as titanium dioxide, a compound that reflects ultraviolet light (UV). High UV light exposure can cause oxidative stress, which may damage vital plant anatomy and metabolic functioning. More research will help determine mode(s) of action responsible for any plant health benefits, a goal of ours moving forward (Figure 3).

Based on current knowledge and observation, pigments have the ability to improve plant health when used routinely during the course of a growing season, and with an added benefit of improved color and quality. We found that after sequential pigment applications to creeping bentgrass, near infrared light (NIR) (longer wavelengths than visible light) reflection increased and turf quality improved. NIR light may also cause oxidative stress. With this in mind, colorants may be important for protecting the plant from potentially damaging UV or NIR light, while increasing exposure photosynthetically active light, thus improving turf performance.

When used correctly, colorants may offer turf managers the ability to conserve valuable resources such as water, seed, and fertilizer. A good example of this would be using colorants at semi dormancy to enhance color and quality without additional water or as a substitute for over-seeding dormant turf. Considering the cost of labor, seed, fertilizer and pest control, painting semi dormant and/or dormant turf has the potential to provide significant savings to the operational bottom line.

POTENTIAL NEGATIVE EFFECTS

Like most things in life, there are two sides to the story, right? Recent studies have suggested potential negative impacts of colorant applications. McCarty, et al., 2014 reported that colorant treated creeping bentgrass exhibited higher CO2 exchange rates, lower evaporation rates, increased canopy temperature, and that turf quality was similar to the control. The authors also report higher canopy temperatures; however we have been unable to detect differences due to the variability associated data collection. Higher canopy temperatures, albeit small, may be responsible for faster germination and establishment when colorants are applied to newly or overseeded areas.

In addition, and while not published to date, work conducted at the University of Nebraska reported that colorant applications reduced turfgrass quality under drought stress. This may, again, be the result of colorants (paints) affecting plant evapotranspiration, or gas exchange. Therefore, it would make good sense to simply discontinue the use of colorants under moderate to severe drought stress. Common sense would dictate that a turf manager should implement good, solid, agronomic practices first and foremost and use colorants as a supplement tool (Figure 4).

Incorporating products and designing programs that use colorants as part of your overall turfgrass management strategies starts by understand how formulations differ and your specific objectives. Scientists are still in "discovery mode" regarding benefits and uses of colorants, however we now believe there are real benefits beyond simply cosmetic improvements. Colorants can optimize turf color and quality, improve aesthetics for actively growing and dormant turf, and some may provide some level of physiological benefit. Specifically, increasing absorption of photosynthetically active light and reflecting potentially harmful wavelengths of light. Remember to test areas first and overlap as necessary in order to produce the desired color depending on grass, water volume, mowing height and stage of growth. ST

Figure 3. Research sites like this one at the University of Tennessee offer scientists the opportunity to develop protocols designed to gain a better understanding of how colorants affect plant health.

Figure 4. Manage athletic fields using sound agronomic practices with colorants, including pigments as a supplement to nutrient, water, and cultivation programs.

SYNTHETIC TURF COUNCIL ON CRUMB RUBBER & ATHLETIC FIELDS

Editor's note: This viewpoint on crumb rubber's use on athletic fields is from the Synthetic Turf Council; last month we presented the viewpoint of Turfgrass Producers International. This piece opens with a statement from STC, followed by an edited version of an article by Megan Quinn that originally ran earlier this year in the March-April edition of Scrap, *a publication of the Institute of Scrap Recycling Industries, with their permission.*

STATEMENT FROM STC

"We welcome the [federal study] announcement of this multi-agency effort and look forward to coordinating with the agencies as well as other stakeholders as this research action plan moves forward.

"We have consistently said that we support all additional research. At the same time, we strongly reaffirm that the existing studies clearly show that artificial turf fields and playgrounds with crumb rubber infill are safe and have no link to any health issues. The current body of research is comprised of dozens of reports, including peer-reviewed academic studies and federal and state government analyses.

"It's also important to note that when we talk about crumb rubber infill in synthetic turf, we are also talking about the same recycled rubber that is used in a variety of products that are widely considered to be safe, such as sneakers, garden hoses, hospital floors, surgical gloves, and an array of other uses.

"We hope the federal government's involvement, which we have been encouraging for years, will settle this matter once and for all, put parents' minds at ease, and validate past and recent due diligence by public officials."

In North America, about 98% of synthetic turf fields use granulated recycled tire rubber, or crumb rubber, as infill. The granules fill in the space between synthetic blades of grass to provide cushioning, aid drainage, and help prevent injuries when athletes run, slide, or take a tumble. Yet even as these fields become more common, some community members have raised questions about whether crumb rubber is safe.

On one side of the conflict are more than 70 studies and literature reviews from state health departments, universities, and other independent entities in the United States and in Europe. None of the studies say crumb rubber is a public health or environmental concern. On the other side are environmental groups and residents who worry that various chemicals in tire rubber could cause cancer or other health problems, and they are asking school boards, cities, and states to ban crumb rubber infill. Tire processors and synthetic turf vendors are concerned that this fear has trumped the facts and maligned a product with real environmental benefits.

Over the years, numerous organizations have looked into crumb rubber's potential health and environmental risks. Studies have examined several factors, such as how crumb rubber affects the human body when it is ingested or when athletes' skin comes in contact with the crumbs. Other research has considered whether crumb rubber releases harmful levels of chemicals into the air. None of the studies have found evidence that the material is harmful.

A 2013 study by researchers at the Rutgers Robert Wood Johnson Medical School in New Jersey evaluated opportunities for exposure to trace metals, semi-volatile organic compounds, and polycyclic aromatic hydrocarbons from crumb rubber infill and the artificial turf fibers. Researchers measured these factors in simulated body fluids representing digestive fluids, lung fluids, and sweat. The researchers found that PAHs were routinely below detection limits, and SVOCs that have environmental regulatory limits were at levels too low to quantify. Some metals were detected, but researchers said the concentrations were low and likely would not cause health problems. "The study demonstrated that for the products and fields we tested, exposure to infill and artificial turf was generally considered de minimus," it stated.

In 2009, four Connecticut state agencies (University of Connecticut Health Center, the Connecticut Agricultural Experiment Station, the Department of Public Health, and the Department of Environmental Protection) evaluated the health and environmental impacts associated with crumb rubber turf fields in Connecticut. Researchers looked at four outdoor fields and one indoor field, asking three soccer players at each field to wear personal monitoring devices to collect samples. The study tested about 200 chemicals at each field. Researchers concluded that there were no elevated health risks from playing on the indoor and outdoor fields, but they noted that indoor fields may need ventilation because of higher levels of chemicals at the one indoor field they tested. The Connecticut Academy of Science and Engineering peer-reviewed the findings.

In 2013, ChemRisk conducted a literature review for the Rubber Manufacturers Association to evaluate the health and ecological risks associated with the use of recycled tire rubber on playgrounds and athletic fields. While some of the ingredients used in tire manufacturing are considered to be "potentially hazardous to human health at high doses, the potential for athlete or child exposure to these chemicals is very

low" when playing on a synthetic turf field, the study says. It notes that heating during the tire manufacturing process causes physical and chemical reactions that bond potentially harmful chemicals into the material, and "the process is designed so the release of chemicals into the environment is inhibited." After reviewing research from both advocates and opponents of crumb rubber, ChemRisk concludes that "no adverse human health or ecological health effects are likely to result from [the] beneficial reuses of tire materials," but it adds that additional scientific studies will help supplement and confirm the studies that have already been done.

MORE STUDIES IN THE WORKS

The US Environmental Protection Agency did a study in 2008 about synthetic turf fields, but officials say it was to test a method for measuring possible emissions from synthetic turf, not to determine possible health risks. The EPA says it "supports more comprehensive efforts to identify potential exposures to tire crumbs and better assess risks," and it announced in February that it would participate in a joint study with the Centers for Disease Control and Prevention and the Consumer Product Safety Commission to further study possible health risks related to crumb rubber used on turf fields. The study aims to identify gaps in the current knowledge, characterize chemical compounds found in crumb rubber, evaluate possible risks, and involve stakeholders such as parents, athletes, and coaches, the EPA says. The agencies say they will have the first status report on the study by the end of 2016.

Al Garver, president of the Synthetic Turf Council, says STC supports the calls for more scientific studies and tests. The council worked with researchers from OEHHA's study to help identify locations of several hundred fields throughout California. "The more it's studied, the more it will validate the fact that the rubber is inert," he says.

CRUMBS OF CONCERN

Despite the scientific evidence to date saying crumb rubber does not pose health or environmental concerns, some communities have opted to ban or avoid crumb rubber infill for turf fields out of caution, saying future studies still could uncover dangerous effects.

Recyclers and rubber manufacturers feel science is on their side and the crumb rubber fears are unfounded. More than 70 independent, peer-reviewed studies done over the past 22 years have offered enough evidence to clear crumb rubber's name, says ISRI President Robin Wiener. "These studies have pointed to the conclusion there is no indication of negative health effects tied to crumb rubber's use in artificial turf" based on the current information, she wrote in an Oct. 27, 2015, letter to EPA Administrator Gina McCarthy. The letter asked the EPA to respond to the public's concerns by highlighting the research, including the EPA's own studies.

The concern has spread to places like Edmonds, WA, which voted in December to put an 18-month moratorium on installing any new synthetic turf fields made with crumb rubber infill from recycled tires. The city council enacted the moratorium after residents protested the local school district's plans to take out the aging grass field at a school campus and replace it with synthetic turf. Patrick Doherty, the city's economic development and community services director, says field construction was already underway when residents learned the new field would have crumb rubber infill, so workers completed the project before protests could halt construction. Because of the community outcry, he says, other fields that were scheduled to get similar upgrades won't see that happen, at least during the 18-month moratorium.

Mark Rannie, vice president of Emanuel Tire (Baltimore), also believes the concerns come more from fear than facts. As chair of ISRI's Tire and Rubber Division, he has followed the issue closely. Though he says communities and organizations have a right to decide whether to use crumb rubber or an alternative on their fields, he wishes people would read the studies to help them make the decision instead of discounting crumb rubber because other communities have concerns. "We just want the truth out there, crumb rubber is not problematic, according to the studies," he says. "If a state agency or government agencies decide to declare a moratorium based on [fear], they are basing it on a political cause, not a scientific one."

Rannie doesn't expect future studies to indicate health risks, but he says the tire-recycling sector welcomes the research. More information and research can help inform the public and show that there's nothing to fear, he says. And, in the unlikely event of a problem, he says, tire recyclers have to step up and be part of the solution. "You have to put health over business," he says.

Those following the crumb rubber debate know it is far from over. Results from the California study may help Edmonds decide how to move forward with new field construction, but it may not be enough to sway worried residents, he says. And in Baltimore, Rannie acknowledges that it may take much more time—and many more conversations with worried customers—before the matter of synthetic turf is settled. Between now and then, many more soccer, baseball, and lacrosse games will go on, but "the best outcome is having the truth, having the evidence, and having those facts listened to," he says. ST

THE RELATIONSHIP BETWEEN WATER AND SOILS

Editor's note: *This article was written by James Spindler, CPAg, CCA, CPSS. He is Director of Agronomy at Ecologel Solutions, LLC; President of BioPro Technologies, LLC; and Research Director for the OJ Noer Foundation.*

Water management has become a major issue in the sports turf industry over the last decade. In the past, water was considered an unlimited resource and was a concern only when an occasional drought occurred. Today, all regions have experienced a change in attitude regarding water. Influenced by rising costs, recurrent drought, use restrictions, politics and social pressures, turf managers are expected to do more with less.

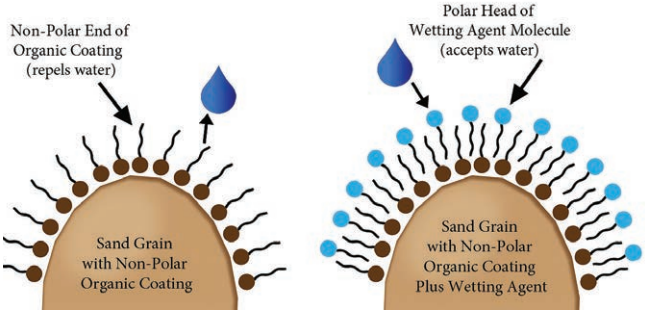
First, the cost of water in many markets, including "water-rich" regions, has increased dramatically since the turn of the century. Surveys have revealed that the cost of water has risen by 25% to 30% in many municipalities, with increases reaching as high as 300% or more in some regions. Is money better spent on other budgetary items than on irrigation? Whether working on the professional level or with a local youth complex, finding ways to manage water from an economical sense has become important to everyone.

Second, the recent severe droughts in the western US, especially California and Texas, have focused property managers and policy makers to reconsider how to best manage water resources. These droughts have reduced some water reservoirs to less than 25% of capacity and have stressed ground water supplies. We have read widely of wells going dry during these times, and many areas have imposed turf and landscape watering restrictions.

Consumers have different perspectives about water when it becomes scarce. There are different definitions of drought depending on who is defining it. These include:

- Meteorological. A measure of departure of precipitation from normal. This is due to climatic differences. What might be considered a drought in one location of the country may not be a drought in another location.
- Agricultural. Refers to a situation where the amount of moisture in the soil no longer meets the needs of a particular crop, including turf and ornamentals.
- Hydrological. This occurs when surface and subsurface water supplies are below normal.
- Socioeconomic. This refers to the situation that occurs when physical water shortages begin to affect people.

One can imagine how conflicts can occur between various water consumers based on the drought definition that applies to them. Each consumer group believes its water requirements should be primary. Governments must consider the desires or various clientele and may struggle to find balance when developing water policy. In many cases, the sports turf industry becomes a political target, particularly with regards to golf. Often regarded as a "sport for the rich," water use on the courses takes heat as a wasteful luxury. With the assumption that green grass is the result of excess water use, highly maintained athletic complexes, parks and other sports fields may experience some of the same social pressures.



How wetting agents work.

In the turfgrass industry, we are most concerned with the agricultural definition of drought. Inadequate soil moisture can occur at any time, even in "water-rich" regions. Agricultural drought can be caused by soil conditions, cultural practices or a number of other factors. The challenge is managing moisture throughout the soil profile so it can be made available to the plant. This article will focus on technologies that help managers use the water they can afford or are allotted by the most efficient means.

Beyond the advancements in irrigation hardware and software, there are many other technologies available for the management of water in the soil. They can have very different modes of activity, and each has been designed for a specific function and purpose. Understanding each technology and soil/water interaction will help turf managers decided which strategy is best suited for their specific situation. The first step in deciding what technology to use is to diagnose the reason for a water problem.

THREE FATES OF WATER

With each irrigation cycle or rainfall, water will succumb to one of three inevitable fates. The desired outcome results in water entering the soil system, being taken up by the plant, and eventually lost to transpiration. Unfortunately, the forces

of gravity and evaporation are constantly working to move water away from plant roots. Gravity plays a role in water lost to runoff, channeling and percolation. When it comes to evaporation, most people consider the evaporative loss that occurs immediately, before water has entered the soil; however, as soils dry between watering, the bonds that hold water molecules together break, causing liquid water to dissipate into its gaseous form. The resulting water vapor is not usable by plant roots and is continually lost to the atmosphere above. Additional irrigation to compensate for water lost to gravity or evaporation may be ineffective based on a number of factors, including soil chemical and physical properties, which affect infiltration and soil holding capacity.

Failure for water to move into or infiltrate the soil. Water may sit on top of a turf or soil surface or flow across that surface away from the intended target. It may find a site to drain through soil, but not disperse evenly into and throughout the rootzone. There are a number of causes for this, but let's consider three possibilities. The first would occur with soils or irrigation water containing high levels of sodium salts. Sodium breaks down soil structure by removing the ability of soil particles to be "glued" together to construct various formations. Soil structure allows for the rapid movement of water into and throughout the soil. Salts may also physically "seal" the soil, preventing water penetration. The solutions for this are either calcium or acid. Calcium containing products, such as gypsum, liquid calcium chloride or calcium nitrate, etc., displace sodium ions and allow for the restoration of soil structure. Sulfuric acid, reacted with urea for safety, will convert lime that occurs naturally or is applied to soil, into gypsum, which supplies the calcium needed to make high salt conditions more permeable.

The second cause may be bicarbonates. Bicarbonates are common in regions where irrigation water comes from limestone aquifers. The bicarbonates will build up in a similar manner as salts and cause a "sealing" of the soil. A simple test for this condition is to drip some vinegar (an acid) solution on the questionable area. If the drop causes a fizz, then high bicarbonates are most likely present. These conditions may be treated with acids or acid forming materials that break down the bicarbonates into CO2 and water. These treatments would include acid materials injected through an irrigation system or applications of acid forming fertilizers, such as ammonium sulfate or ammonium thiosulfate liquid.

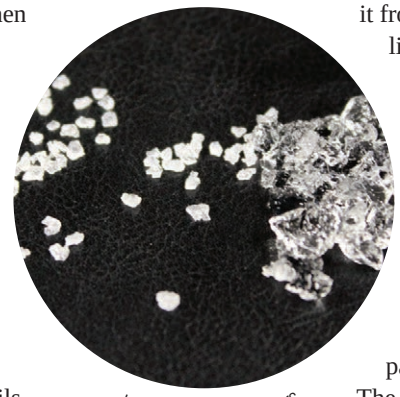
A third possibility may be caused by a waxy, organic coating on soil particles. The waxy coating comes from the decay of organic materials and certain species of fungi that exude waxy substances. These waxy coatings form non-polar hydrophobic surfaces that have no charge to attract water molecules. The water does not enter and disburse through the soil. The only polar surfaces are the surfaces of other water molecules. The water will find the path of least resistance and may either flow across the surface and/or find a channel through the soil profile to drain, thanks to gravity. The most common solution to this situation is the use of a penetrant, such as a surfactant or wetting agent.

Water channeling through soils. Beyond the influence of salts, bicarbonates or hydrophobic conditions, there may be other times when water will not disperse evenly through the soil. This may occur as a result of varying soil structure, compaction, inconsistent composition, layering, etc. Water will always following the path of least resistance and may drain through channels in the profile, leaving adjacent areas void of adequate water to supply plants. As a result, these areas become much more susceptible to drought or wilt, even under ideal irrigation coverage. These conditions are a primary cause of localized dry spots (LDS). The use of wetting agents or surfactants combined with cultural practices including aeration is often used to alleviate water loss to channeling.

Total water holding capacity of soil. Soil has the ability to hold a certain amount of water. The maximum amount of water soil is able to hold is generally referred to as "field capacity." Field capacity is the condition that occurs after soil is completely saturated and excess water is allowed to drain away. The remaining water is either used by plants or lost to evaporation until the soil reaches the "permanent wilting

point." The permanent wilting point occurs when soil moisture drops so low that plants wilt and cannot recover. The amount of water available to the plant between field capacity and the permanent wilting point is referred to as the "total available water holding capacity" of the soil. This can be affected by soil texture, organic matter content, the ability of the soil to accept water as well as other factors.

Heavy textured soils with higher percentages of clay and silt will hold more water than lighter soils with high percentages of sand. Soils containing higher levels of organic matter will hold greater quantities of water than soils low in organic matter. Soils with a high level of organic non-polar coatings on soil particles will resist the acceptance of water and will hold less water than soils with less non-polar coatings. Sandy soils are more susceptible to non-polar coatings.



Hydrated vs. dry polymers.

Products that help soil retain greater quantities of water and for longer periods of time include hygroscopic humectants, polymers, and surfactants/wetting agents.

TECHNOLOGIES FOR OPTIMIZING SOIL MOISTURE MANAGEMENT

Hygroscopic humectants. Though they are not new to the industry, hygroscopic humectants are continuing to gain notoriety with sports turf professionals as products that are very effective at reducing overall water requirements. With a history in golf, these products have been gaining greater attention due to their recent performance in drought stricken areas of California, Texas and other western states.

Hygroscopic humectants manage and conserve water through two modes. As the name suggest there is a hygroscopic compontent and a humectant component. Each has a critical function in the performance of the technology. The mode of action of the hygroscopic component is to condense soil water vapor or soil humidity back into liquid droplets of water. The hygroscopic ability of these materials can be compared to condensation or "sweat" that occurs on the side of a cold drink. Rootzone humidity that cannot be absorbed by plant roots is converted into plant usable micro-droplets of water. There are other materials used in this industry that are hygroscopic in nature. These include fertilizers such as urea. The hygroscopic nature of some fertilizers may cause bridging in a spreader, or turns a bag of granular fertilizer into a "brick." The same hygroscopic materials used in hygroscopic humectants are also used in certain foods, such as breads, and in toiletry groups (e.g., toothpaste) to keep them moist and pliable.

The humectant components hold the water droplets condensed by the hygroscopic components. Do not confuse a humectant with a humate. They are completely different substances with different molecular structures. The humectant component holds the droplets tightly enough to prevent it from leaving the proximity of the root, but lightly enough to allow the root to absorb the water through osmosis. The humectants in hygroscopic humectants are also used in cosmetics, shampoos, and other body care products where they help hold moisture in the skin and hair.

Available in both liquid and granular options, hygroscopic humectant technologies must be watered-in, at which point the active ingredients will coat plant roots, soil particles and organic particles in the rootzone. The hygroscopic humectant molecules are too large to be absorbed by the roots. Once these components attach to the roots and soil particles, they remain attached and are resistant to further movement in the soil. The ingredients are primarily derived from plant byproducts (some brands are rated at 93% biobased by the USDA BioPreferred Program, such as Hydretain and LESCO Moisture Manager). Therefore, they are eventually broken down by soil microbial activity. Research and users have demonstrated that the most effective hygroscopic humectants products have been able to reduce water use by up to 50% and will typically perform for up to 90 days. In addition to providing general conservation of water, hygroscopic humectants aid in seed germination, transplant establishment and in establishing sod and sprigs. Hygroscopic humectants have also been used to suppress dust on baseball infields, horse arenas, dirt race tracks, etc.

Super absorbant polymer. This technology tracks its orgin to a patent by Monsanto in 1963. They described polymers as "strings of large molecules that chemists use like Tinker Toys, adding, subtracting or linking them together to create diverse uses ranging from filling for disposable diapers to dental products. Baby diapers are a well-known use for this technology.

Polymers have been adapted for use in soil to improve water availability to plants. They are used to "increase a soil's water holding capacity, increase pore sizes and numbers in the soil, increase germination rates, and decrease or mitigate the effect of soil compaction on plant growth. The five main types of soil polymers available commercially include:

- Cross-linked polyacrylamides (gel forming)
- Non-cross-linked polyacrylamides (water soluble)
- Polyacrylates
- Polyacrylontrile
- Starch-grafted copolymers

The most commonly used polymer is the cross-linked polyacrylamide. Soil polymers occur in a crystalline form. When exposed to water, they expand into a gelatin-like block. When used in soils, they function as mini-reservoirs of water. They absorb water and hold it until the plant removes the water. The literature indicates that cross-linked polyacrylamide polymers used in the field will absorb and hold 80 to 200 times their weight in water or more. Their ability to hold soil water is

influenced by the amount of polymer in the soil; the type of polymer used and soil characteristics, such as salt content. As the concentration of ions increases in water, the amount of hydration by the polymer decreases. The lifespan of polymers is thought to range from 2 to 10 years, depending on the type of polymer and soil conditions.

The literature reports that the time between irrigation events can be extended with the use of polymers, but the actual water savings with use of these products is dependent on application rates and soil conditions. Cost of these products may be a limiting factor for effective application rates.

Initially, polymers were used to help manage water in potted plants, ornamental beds and in planting trees and shrubs. Over the years, soil-applied polymer use has expanded to turf applications. They are used in the establishment of sod and sprigs, improving seed germination and in general turf use. The challenge in using polymers on established turfgrass is delivering the polymer crystal to the rootzone. Some turf managers will aerate the turf and drag the crystal into the holes. In addition to this practice, there are now machines that will inject or "plant" the polymer crystals into the soil.

Surfactants/wetting agents. Surfactants or wetting agents are probably the most common products used to manage soil moisture. These materials are used for a number of applications in turf and plant management, including relief from localized dry spots, improved drainage, assist the efficiency of various pesticides, reduced dew and frost accumulation, improved seed germination, reduced fairy ring damage, alliviation of soil compaction, improved irrigation efficiency, diminished dust on dirt paths, enhanced firmness of golf course bunker sand and more.

Surfactants stand for SURFace ACTive AgeNTS (SURFACTANTS). These are agents that affect the surface of a liquid or solid. As previously stated, the formation of waxy, non-polar coatings on soil particles is the cause of hydrophobic conditions. The non-polar soil particle surface will not attract, and may actually repel, the polar water molecule, which prevents irrigation water or rainfall from infiltrating soils to hydrate plants. Creating a polar surface allows water molecules to enter and fill the soil. The surfactant has a non-polar and a polar end on the molecule. The non-polar end of the surfactant molecule aligns with the non-polar surface of the organic soil coating, leaving the polar end exposed outward from the soil particle. This allows the polar water molecules to be attracted to the polar surfactant molecules therefore overcoming the hydrophobic condition.

There are many different kinds of surfactants, most of which fall into these four basic categories:

- Anionic – Form negatively-charged ions in water
- Cationic – Form positively-charged ions in water
- Nonionic – Does not ionize in water
- Amphoteric – Take on the ionization of the water

Non-ionic surfactants are the most common products used in the turf industry due to their safety, compatibility with other products and ease of use. As technology has improved, a number of categories of non-ionic surfactants have been developed. These include:

- Polyoxyethylene (POE). This is older technology originally developed to treat localized dry spots. They can be phytotoxic.
- Block Co-Polymer Surfactants. These are the most commonly used turfgrass surfactants. They are safer and are effective in treating soil water repellency, improving soil water content and plant available water. This category has two sub-categories: Straight Block Co-Polymers and Reverse Co-Polymers.
- Alkyl Polyglucoside Surfactants. These are made from sugar molecules reacted with a fatty acid and are considered as naturally derived. When blended with a block co-polymer the performance appears to be better than either technology alone. These blended technologies appear to increase water infiltration, improve water availability and enhance irrigation efficiencies.
- Modified Methyl Capped Block Co-Polymer. This is a class of surfactant that is a modification of the co-polymer class. This technology forms a thinner, more continuous film around the soil particle.
- Humic Substance Redistribution Molecules. These molecules allow water penetration through the soil profile by

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TECHNOLOGY TREND: PUTTING THE 'AIR' IN AERIFICATION

BY **STACIE ZINN ROBERTS**

For 3 straight days in May, more than 100,000 people thrashed and mauled the turf at MAPFRE Stadium in Columbus, OH where the city's Major League Soccer club is based. Hard rock bands Red Hot Chili Peppers, Megadeth and Rob Zombie shredded guitars on the stage while thousands of fans rocked out on the field. Six days later, Weston Appelfeller, CSFM, director of grounds for Columbus Crew SC, was preparing the same field for a soccer tournament when the skies opened up and dumped 2 inches of rain in 40 minutes.

"With all of the compaction caused by foot traffic from the concert, our field was very hard and not draining well," Appelfeller says.

Appelfeller and his three-man crew could have run squeegees over the playing surface "but we would still have been splashing through puddles of water." Instead, in the short window between when the rain stopped and the team members' cleats were scheduled to hit the turf, from 5:15 pm to about 6:40 pm, Appelfeller's crew ran a new type of aerifying machine over the playing surface, an aerifier called the Air2G2 from GT AirInject. The Air2G2 fractures the soil by inserting three probes up to a foot deep into the soil and injecting air (oxygen) at to 7 inches deep, and again at 10 to 12 inches deep, with each drop. Injecting air laterally through the soil profile creates pore space for water to drain and increases the gas exchange in the soil.

By 7pm when Columbus Crew SC began their warm ups, the field was damp but showed no signs of standing water. "There were no standing puddles by the time the game started," Appelfeller says. Lightning caused a delay later in the game but the field remained playable.

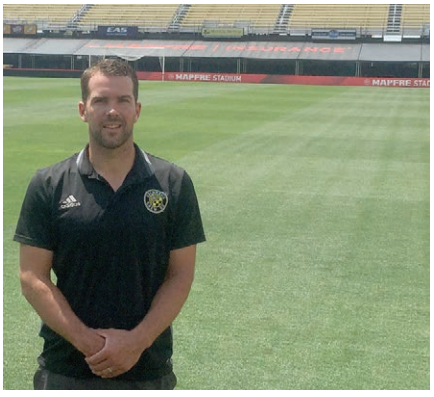
The field at MAPRE stadium was built with 10 inches of sand over a gravel drainage layer. The Kentucky bluegrass overseeded with perennial ryegrass hasn't been re-sodded since 2006. Appelfeller credits the longevity of the field's playing surface, in part, to his aggressive aerification program. In the 4 years since he joined the Columbus Crew SC staff, "every 10 days we are doing some form of aerification."

At Columbus Crew SC, Appelfeller rotates between four different methods of aerification, depending on how much downtime he has on the field. If the break between games or events is longer than 10 days, he'll pull cores "if we feel we have enough time for the field to recover" and allow the holes to heal. If not, he'll solid deep-tine aerify, use a slicing machine on the surface, or fracture the soil profile beneath the surface with the Air2G2.

"We use our Air2G2 whenever we want because there's no disruption to the playing surface whatsoever," Appelfeller says. "We use the Air2G2 usually once a week. We take it out onto the field and do certain areas that we feel are a little bit more compacted or areas that we want to soften up for our team; the goal mouths, referee runs, that sort of thing."

While pulling cores is generally used to remove organic matter, and solid tine or slicing disturbs only the top of the rootzone and soil, the Air2G2 reaches deeper into profile and injects air (oxygen). So unique is the innovation that the Air2G2 was awarded the 2015 STMA Innovative Award.

Ben Jackson, CSFM, working the Air2G2 in Columbus.



Weston Appelfeller, CSFM, Director of Grounds, Columbus Crew.

"We are actually doing what aerification is defined as, we are infusing oxygen into the soil profile, relieving compaction and increasing the gas exchange and doing this with minimal or no surface disruption," says Glen Black, president of GT AirInject.

"It's a whole different process," adds Todd Jones, general manager of GT AirInject. "It's up to each sports turf manager, what they're trying to accomplish. If the intent is to remove some of his organic matter to get new amendments back in, core aerifying or fraise mowing may be the answer. The Air2g2 machine is a true aerifier, relieving compaction and stimulating root growth with oxygen. If relieving compaction, stimulating gas exchange and increasing porosity are also the goals, with minimal disruption of the surface, the Air2G2 machine is the answer."

The Air2G2 has three ½-inch probes, spaced 30 inches apart. When the probes are inserted up to 12 inches into the ground, air is injected at two different times at two different levels below the surface (at 6 to 7 inches and at 10 to 12 inches) fracturing the soil in a 9-foot circumference from the probe. Once the probe is retracted from the ground, the hole left behind is virtually undetectable in a stand of healthy sports turf.

The Air2G2 machine has an MSRP of $38,750. The machine may be purchased outright or leased for approximately $700 per month. Air2G2 distributors around the country also offer contracting services. A new handheld version, the Air2HP, must be hooked up to an external compressor or to the Air2G2 machine. The Air2HP can be used to spot treat smaller areas and hard-to-reach places like sand bunkers, flowerbeds, the base of trees or around irrigation heads. The Air2HP retails for under $500.

At the University of Tennessee in Knoxville, Darren Seybold has been director of sports surfaces for 6 years. He has had an Air2G2 machine for a year and has found creative ways to use it — for much more than just compaction relief.

"Aerification was always one of those thing things people thought you did once or twice a year and you were good," Seybold says. "I think what

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we're learning is that the more you do it, the better the fields are. They're stronger. They're healthier."

His crew of 13 full-time staffers and 20 students maintain not only the field at Neyland Stadium, but also two grass football practice fields, baseball and softball fields, two soccer fields, a 60-acre, three-hole golf course facility with large driving range and practice facility, plus tennis courts, as well as the grass at the track facility and landscaping around all sports facilities. The grass at all of these facilities are varieties of bermudagrass (mostly 419, but also some Latitude 36 and Northbridge), with bentgrass on the greens of the golf course.

Managing all of this turf is a big job and "aerification is huge," says Seybold, "especially for SEC football." Coaches, who always want the facilities to "look good for recruiting and camps," request frequent re-sodding of the stadium and practice fields. This means that the soil subsurface is graded, sod is laid, then rolled, causing more compaction. Almost immediately, Seybold runs the Air2G2 over the new sod, fracturing the compacted soil and creating air flow in the soil below. On the new sod, "we had a noticeable green-up faster, it came out of shock faster, rooted down faster." Now, the Air2G2 is a part of his sodding process because it "allows the new roots to grow down deeper, quicker. And that's what we're all looking for, to get on the field faster."

In the winter months, Seybold and crew cover the University of Tennessee baseball fields with tarps. Those 10,000-square-foot tarps not only hold in heat and protect the fields, but they hold moisture and rainwater on the tarp surface that must be dumped in order to move them. All of that water, 10,000-square-feet of it, usually lands in the same area of the native soil outfield. "That area is constantly getting more water than anywhere else," Seybold says. To help it drain, he uses the Air2G2. "It lets the water go down. It lets the water release and the compaction release."

Seybold also notes that he'd generally hesitate to use a core-style aerifier in the winter, for fear of damaging the turf with "a big, heavy tractor" as well as getting too much cold air into the ground.

In fact, all last winter, Seybold's crew used the Air2G2 to aerify through the cold winter months, saying that the machine leaves "not such a big hole in that we would be worried about cold temps."

Perhaps an unexpected benefit of fracturing the soil so deeply which encourages deeper root growth, is a decrease in water use.

"With this kind of moisture management, you're allowing your roots to go deeper and your water consumption should go down. I would agree with that," Seybold says. "I know we're going at least a day or two longer in places between irrigations."

In the past year, Seybold has noticed an overall improvement in his turfgrass health. "I notice the grass isn't stressing as much in high traffic areas. I'm not seeing the yellowing that I'd normally get," Seybold says. "In the soccer goal mouths and some outfield positions in softball, we saw a difference. They just don't wear out as fast as they did. The grass is just stronger. It's at a better root depth so the grass is healthier."

Above all, at a college football stadium where tens of thousands of fans and millions of dollars in television revenues and donor support hinge on field conditions, Seybold has come to rely on the Air2G2 for game prep. "You can use it (during) game weeks. There's no surface disruption so you can keep it tight. It doesn't soften the top but it allows the bottom to still be able to drain, which is obviously important. It's been an invaluable tool for us so far."

NEW PRODUCT

TEMPLINE PREMIUM GRASS

Eco Chemical TempLine, the original manufacturer of synthetic turf paints and removers, has developed a new Premium Grass paint to be introduced under the TempLine brand. This new product sets a new standard for brightness, opacity and durability in an eco-friendly formulation. TempLine Premium Grass will be sold in 5-gallon pails as a concentrate that is safe for both grass and soil while providing a durable coating that stays on the field and off of uniforms.

If you want a field paint that works as hard as you do for a price that won't break the budget, you need TempLine Premium Grass Paint. Free samples available at www.eco-templine.com.

Eco Chemical

Continued from page 37

disrupting the hydrophobic supramolecular humic association, most prevalent in the top one to two centimeters on the soil, which lead to localized dry spots.

■ Multi-branched Regenerating Wetting Agents. Most surfactants have linear molecules. These products have a much higher molecular weight and multiple branched molecules. Each branch essentially functions as wetting agent itself.

Surfactants/wetting agents have been demonstrated to possess many functions in the management of water in and around turfgrass and other plant systems. When discussing the maximization of water use efficiencies, these products tackle the barriers (non-polar coatings in the soil) that prevent water from moving into and distributing throughout the soil. Research has shown that surfactants/wetting agents can significantly improve soil moisture content and reduce variability in soil water content, improving soil moisture uniformity. In addition, they have been shown to "reduce localized dry spot incidence, allow for longer periods between irrigation events, and reduce hand watering in isolated areas."

Surfactants/wetting agents are available in liquid and granular forms. The amount of water conserved, longevity of the product and cost may vary based on product type and local conditions.

There are a wide variety of technologies available to help manage and conserve water. As with pesticide selection, the key to success is to identify the cause(s) of water challenges. If salts or bicarbonates are a problem, there are calcium and acid based treatments. If non-polar soil particle coatings are the challenge, there are a variety of surfactant/wetting agent solutions for this condition. If poor water holding capacity is the issue, there are hygroscopic humectants and polymers.

As a final note, it is advisable to remember to not think linearly. Often, there is not one single issue with one single solution. The best solution for the management and conservation of water may be to combine technologies. A very common example of this is the combination of hygroscopic humectants with surfactants technologies. In this situation, the surfactant will allow water with the hygroscopic humectant to enter and disperse throughout the soil where hydrophobic non-polar organic coatings exist. Water can uniformly disperse throughout the rootzone. Then, the hygroscopic humectant can reduce evaporative loss for maximum plant water use.

Thinking outside the box and using all tools available gives turf managers the ability to maximize water use efficiency and optimize turf and plant performance. ST

Collegiate Varsity Soccer Field, Collegiate School Goochland, VA

Why STMA should consider your field a winner?

Athletics is a big part of Collegiate. The school prides itself in producing top athletes and in order to produce great athletes, we have to have great facilities. Pride is taken in all that we do. I encourage my staff to realize that even though we are not coaching this team, we are creating the playing surface that makes memories possible for all of our athletes. I have a great staff that truly takes this philosophy to heart.

The Varsity Soccer Field is one of my favorite fields. Over the years, we have implemented new maintenance techniques. This year, instead of paying an outside service to sod our goalmouths, we bought a hex plugger and went to a practice field that is also Riviera bermuda and pulled what felt like a million plugs to plug our goalmouths. We did this in late June, and by mid-August when the soccer team started practice, we had full cover.

Another practice that has dramatically improved our turf quality is the implementation of using Primo Maxx growth regulator. This has helped with the lateral growth and significantly improved the thickness of our turf which helps the field hold up to the excessive use. When I first considered using a growth regulator, I was nervous that I would not get enough growth to fill in our centers that were worn by the end of last season. Boy was I wrong, and I have never turned back from using it!

As with any facility, we have our challenges. Water is our biggest limiting factor. We only have a pond and small well to supply 11 natural grass fields and landscape. In the summer we have to "starve" the fields of water when it gets hot and dry. This is a huge detriment because it usually happens when we are pushing the field to have it fill in before the next athletic season starts. It takes constant monitoring to ensure the field has enough moisture but not run out of water completely.

To summarize, the STMA should consider our field a winner because we take pride, we have great staff, we love what we do, and we utilize the latest technology as well as all the resources available to us to keep this field looking its best at all times.

SPORTSTURF:What attracted you to a career in sports turf management?

MOYER: I grew up on a farm and I knew I didn't want to sit in an office all day every day. Hard work doesn't scare me and I love seeing kids enjoying the fields we work so hard to create. I remember playing sports when I was younger. We just had ankle turner fields that no one put much thought or work into. The philosophy was "oh it's grass, it will grow. All we have to do is cut it." I wanted to create something better. I believe if you show pride in the field, the players ultimately show more pride in their athletics.

ST: What are your biggest challenges in providing excellent playing surfaces? And how do you approach those challenges?

MOYER: Water management. We pull our water from a small pond and two wells. On a hot, dry summer we will run out of water and we have to "starve" the fields of the moisture they need. This stresses the turf and slows the growing of the fields that in turn slows our recovery of filling in our centers. We have hopes of getting county water one day but until then we closely monitor our water levels to ensure we utilize every bit of water we have.

Category of Submission: Schools/Parks Soccer

Sports Turf Manager: Allison Moyer

Title: Grounds Supervisor

Education: Bachelor of Science, Turf Management & Horticulture, Virginia Tech

Experience: For the past 8.5 years I have been employed at Collegiate School managing 12 natural grass athletic fields, two synthetic turf fields, and all of the grounds surrounding our two campuses (approximately 100 acres). Since I have been here at Collegiate I have been a part of renovating/building seven fields. Prior to being at Collegiate, I was in sales at a local seed and fertilizer company.

Full-time staff: Tito Fortis, Mark Chambers, and Jesse Garrant. Although these are the staff that has responsibilities on this field, they are far from dedicated to only our Varsity Soccer Field. We have 13 other fields we stay busy maintaining also.

Original construction: 2000; we renovated this field in 2011 from a non-irrigated clumpy, ankle turner perennial ryegrass field to an irrigated Riviera bermudagrass field. We incorporated 200 tons of compost into the top 6 inches of native soil.

Rootzone: Native soil

Turfgrass variety: Riviera bermudagrass

Overseed: We overseed each year with perennial ryegrass at a rate of 12#/1000. We split the applications to get good establishment during the playing season but also fill in the holes at the end of the season.

Drainage: No drainage system

ST: What's the greatest pleasure you derive from your job? What's the biggest headache?

MOYER: The greatest pleasure of my job is at the end of the summer when our athletic fields look their best. I can look back to the beginning of the summer when we sprayed the ryegrass out of the bermuda and felt that feeling of "wow, we have a lot of work to do on these fields" and know we accomplished our goal. To have the fields in the best shape possible for the start of athletics. The biggest headache of my job is water limitations.

ST: What changes if any are you considering or implementing for the winning field in 2016?

MOYER: We are considering fraze mowing. It looks great now so it is hard to convince some that even though it looks so good right now that the fraze mowing will make the field even healthier.

ST: What's the best piece of turf management advice you have ever received?

MOYER: The best advice I received came from a friend that has been in the industry a long time: Learn from others!

We are all in this industry together. More than likely if you are struggling with something, someone else has already faced it and knows the solution. Visit other facilities and use their ideas. It isn't stealing, it is just borrowing. Again, we are all in it together.

The greatest pleasure of my job is at the end of the summer when our athletic fields look their best.

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

MOYER: Yes, we do several sustainable management practices. The first that comes to mind is we have been very dedicated to using compost on our fields. We try to schedule this in the 2 months that we are able to close our fields for the summer. Another sustainable practice that we do is water management. We are diligent on not wasting water and our irrigation system has a weather station connected to it to monitor rainfall.

ST: How are you using social media at work?

MOYER: Not using it.

ST: How do you see the sports turf manager's job changing in the future?

MOYER: Thanks to the STMA, I see our industry becoming more and more professional. Twenty years ago having a sports turf management job was rare at the high school level, and getting a degree in it was unheard of. The industry has come a long way in what is expected in field quality. ST

The Field of the Year Awards program is made possible by the support of sponsors Barenbrug USA, Carolina Green Corp., Ewing, Hunter Industries, and World Class Athletic Services.

MAINTENANCE PLAN

JANUARY
Take up turf blankets to harden ryegrass for 1 month, before spring athletics begins

FEBRUARY
Late February, Spring Athletics begin. Take Soil Samples

MARCH
Late March, apply 10 bags of 5-0-20 1.5% Ronstar to get 3# AI/A and approximately .2 # of Nitrogen to help green up spring ryegrass
March 24, first mowing of the year

MAY
Apply 8 bags of 21-0-0 to get 3/4# of N to "wake up" the Bermuda. I chose to use ammonium sulfate because of the soil tests taken earlier in the year showed my pH was high I'm guessing due to all of the compost that has been put on the field over the years
Late May- Core Aerate
Late May- Spray Monument to kill out ryegrass

JUNE
Put turf blanket on goalmouth with large area that needs to be sodded. Left on for 2 weeks
Sprayed Primo Maxx (10oz/A) + Nitamin (1# N/1000sqft). Nitamin is a slow release liquid fertilizer that we have used over the last several years and has shown good results
Core Aerate
We deep tine and topdress with a compost/sand mixture every other year on this field. This was our off year.
Late June plugged goalmouths

JULY
Hand-watered goalmouths; core aerate; spray Primo (10oz/A) + Nitamin (1#N/1000sqft)

AUGUST
Core aerate; spray Primo (10oz/A) + Nitamin (1#/1000sqft)

SEPTEMBER
Late September-Sprayed Revolver @ 17.4oz/A to kill any germinated Poa. We have done this for several years to reduce/eliminate (if that is ever possible) Poa from emerging in the spring. We had a major problem in past years. This application is working well and we have seen significant reduction in Poa
Sprayed 5-0-20+sulfur. We sprayed 1#K/1000sqft. This application was tank mixed with the Revolver app

OCTOBER
Early October, seed field with perennial ryegrass 750#. We do split applications for our seeding to get good establishment with the warmer temperatures and then come back at the end of the season to go back down the center.

NOVEMBER
Early November, final overseeding of 500# of ryegrass. We do this in the last week of play to get the areas that were not established due to use. In early Nov. of 2014 we had a Shockwave slicer come in and slice the field down to 10"-12" depth. This was done because drainage had become an issue on the field in the fall. It worked wonderfully giving the water channels to drain off of the field.

DECEMBER
Put on turf blankets to help with establishment of the late seeded ryegrass.

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As you plan your trip to the 28th STMA Annual Conference and Exhibition, January 24-27, 2017, in Orlando, factor in these free benefits provided to attendees by Disney Destinations. First, all attendees who stay at our host hotel, Disney's Coronado Springs, through Thursday night, will receive a complimentary "after 4 p.m." theme park ticket. The ticket is valid during our meeting dates and 7 days after the conference. Use the ticket at Epcot, Magic Kingdom, Hollywood Studios or Animal Kingdom.

Receive a free $25 Disney Dining Card, too, for staying through Thursday at Disney's Coronado Springs Hotel. The dining card is valid at participating food and beverage locations within the Walt Disney World Resort.

These two benefits will be provided at check-in.

Disney's Magical Express will transport attendees to and from the Orlando airport at no charge. Look for details on how to book the shuttle in STMA's conference brochure, digital and print versions, which will be available in early October.

Thank you to the First 15!

In June STMA presented its new environmental certification program to members. Fifteen members are in various stages of certification. Thank you to those who are pursuing it. This program certifies that facilities have implemented environmental best practices. It involves two facility assessments, one that is conducted by the sports turf manager. After the turf manager completes an assessment of 10 areas and achieves a passing score of 80%, the second assessment is conducted on site by an attester. The attester validates that the environmental practices cited in the sports turf manager's assessment are in place. Attesters can be a certified sports field manager who is not affiliated with the facility being attested, an academic in the industry, or a member of an environmental group in the area. For the attesting phase, the sports turf manager is charged with finding an appropriate attester.

The 10 areas that will be assessed include storm water management, fertilization, pesticides/integrated pest management (IPM), recycling, composting, mowing, energy conservation, shop buildings and storage areas, irrigation and water quality testing, and educational outreach.

There is no cost to go through the process. However, when certification is awarded, the facility's representative will able to select a banner or a plaque designating the certification. A fee of $100 will be assessed at that time.

Recertification is required every 3 years, which is to repeat the process of assessing and having it attested.

This program differs from the STMA Certified Sports Field Manager (CSFM) program, which validates the knowledge, skills and abilities of the sports turf manager through a rigorous test. Recertification is earned by taking continuing education and through industry service.

For more information on both programs, go to STMA.org and click on the Professionalism Tab.

HONOR SOMEONE WHO HELPED YOU ADVANCE PROFESSIONALLY

Nominate a peer for a Founder's Award

Mary Owen, University of Massachusetts, accepts the Dr. Daniel Award this year from Brian Scott, Mt. San Antonio College, the previous winner.

The founders of STMA, Harry Gill, George Toma, Dick Ericson and Dr. Bill Daniels, had a passion and dedication to advance the profession of sports turf management. There are those in this industry who embody their ideals, and STMA recognizes these individuals with a Founders Award in a surprise presentation during its annual awards banquet.

We need to know who you believe has had an impact on you personally and the profession. Consider nominating someone who expresses these qualities:

George Toma. One of two living founders, George continues to serve as a mentor for many in the sports turf industry. He emphasizes the importance of the entire crew in effective sports turf management.

Dick Ericson. He was the first president of STMA and whenever possible he attends the STMA conference to present his namesake to someone who focuses on effective management and increased professionalism within the sports turf industry

Board nominations close August 15

Love a challenge? Want to give back to the profession? Consider running for the 2017 STMA Board of Directors.

The process is easy. Go online to STMA.org and fill out a Board Service Interest Form. After the Nominations process closes on August 15, the Nominating Committee will begin its process to evaluate candidates and develop the slate of candidates. In November, the Committee will present the slate via an electronic ballot to the STMA membership.

STMA is seeking interest from all voting categories of Membership. Although directorships that represent specific membership categories are up for election, so is the At-Large Elected Director, which can be held by any voting member in any membership category.

Positions that are up for election include:

- Director representing professional facilities
- Director representing K-12
- Commercial Director
- At-Large Elected Director

The interest form gathers information on applicants' qualifications, previous volunteer service, and asks for a vision statement for the STMA. ST

Dr. William Daniel. He set the pattern for educator/researcher involvement in the Association. This award honors an individual who has made significant contributions to the sports turf industry through his or her research, teaching or extension outreach.

Harry Gill. The individual who receives this award has provided outstanding, prolonged service to the STMA.

To find out the specific criteria for each award, go to STMA.org and click on the Professionalism tab. ST

STMA Affiliated Chapters Contact Information

The Mid-Atlantic Chapter is in the process of re-forming. If you are interested, please contact one of these steering committee members: Nicole Andrews, Matrax, Inc., Don Follett, Baltimore Ravens, Heather Johannes, Howard County Parks Operations Division, Jason Kopp, Turf Equipment Supply Company, Dr. Ken Mathias, University of Maryland, College Park, Nicole McFadyen, Baltimore Orioles, Jerad Minnick, Growing Innovations, and Michael Stachowicz, National Park Service. Email STMAinfo@STMA.org to find out their individual 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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AUGUST 2016

SportsTurf magazine ADVERTISERS' INDEX

Q&A with Pamela Sherratt

Questions? Send them to 202 Kottman Hall, 2001 Coffey Road, Columbus, OH 43210 or sherratt.1@osu.edu
Or, send your question to Grady Miller at North Carolina State University, Box 7620, Raleigh, NC 27695-7620, or email grady_miller@ncsu.edu

Why be a sports turf manager?

Q: Why should I enter a career in turfgrass science and what jobs are open to me?

— Bri Schneider, Sports Industry Major, The Ohio State University

A: Before we get into the nitty-gritty about salaries and job prospects I'd like to spend a few minutes talking first about what a career in turf involves and why you should definitely consider it as an option.

Careers in turf management involve working with plants and people, and so the fundamental knowledge needed to be successful in turf includes those related plant science, technology, engineering and math. Turf managers are also required to develop strong leadership skills in communication, project management, and personnel management, since a large part of their job may involve interactions with staff, field users, the general public, and the media.

One of the greatest advantages to working in turf management is that there are plenty of opportunities to work outdoors. If you love being outside, an outdoor work environment can feel fulfilling on many levels and definitely contributes to a high quality of life. Enjoying fresh air and sunshine beats being stuck in a cubicle in an office building any day of the week.

Most of us have experienced the feeling of utter peace and love for the job that occurs as you stand on an athletic field or a golf green at sunrise, just before a major game or tournament. That's a feeling that can't be beat. In addition to the love for outdoors, many people get into a turf career because they love and want to work around sports. A turf manager gets to play a role in success of the team by using his or her working knowledge of the sport to determine what field conditions are best for the athletes.

Lastly, I would be remiss if I did not state that a big advantage of working in turf is the turf community, the people. Basically, turf people rock. They possess a strong feeling of collegiality, a genuine desire to help young people succeed, and an uncanny ability to work hard but also enjoy life. If you want to work in an industry of genuinely good people, this is it.

Now let's talk about the nitty-gritty.

Looking to the future, job security looks good. According to the Bureau of Labor Statistics (BLS), there were 178,000 first-line supervisors in turf management in 2014 (examples of job titles include Field Manager, Grounds Crew Supervisor, Grounds Foreman etc.). They predict that 39,000 job openings will be created in the next 10 years, with a projected industry growth of 5-8% during that same time period. If we assume that there are 50 university turf programs across the country, each producing 20 graduates per year (this number is high) it equates to 10,000 new turf graduates over the next 10 years, far below the needed 39,000 needed to fulfill industry needs. The bottom line is that there are far more jobs than people right now, and this trend will continue.
A much-touted statistic is that more than 90 percent of graduates who earn a degree in sports turf management land a job right out of college. Few industries can rival that success rate.

Looking at salaries, sports turf managers can make $35,000 to $100,000 per year depending on where they work. The highest salaries are typically at professional athletic stadiums or large sports complexes. The STMA has salary figures for 2012 posted on their website (STMA.org) and they are currently conducting a 2016 salary survey. Preliminary figures are as follows: A sports turf manager's mean salary is $65,300 and the median is $62,000. An assistant sports turf manager's mean is $45,149 and median is $43,000. (Disclaimer: Data provided in 2016 STMA Compensation Survey with 17.5% of members responding; the survey was still open as of this writing.) These figures are similar in nature to those reported by the BLS in 2015. In its most recent survey, the National Association of Colleges and Employers found that the average starting salary for a 2016 graduate with a bachelor's degree is ~$50,000. Remember that this is the national average, with some occupations much lower (education at 34K) and some much higher (engineering at 64K). Agricultural and natural resource careers were in the middle of that range. What's important to keep in mind if choosing a career in turf is that there is prospect for growth and promotion within the industry is very good. As mentioned earlier, the demand for good people is far going to outweigh the supply.

Lastly, let's look at the types of careers available in the turf industry. They could be listed as: sports turf and grounds management (taking care of sports fields and/or facilities), turf or sod production and sales, product sales and marketing (for example seed and fertilizer), field construction, renovation and consultation services, and academia (teaching, research and consultation). While each one of these careers requires knowledge of turf they vary greatly in nature. My job has a large teaching component; a sports facility manager may have a large part of their day dealing with budgets, staff issues and media communications; while a baseball field manager may be preparing to host an All-Star Game or a Rolling Stones concert. That's also what's great about the industry; each day has new challenges and opportunities to learn and grow. It's never, ever boring, believe me! ST

14 DAYS

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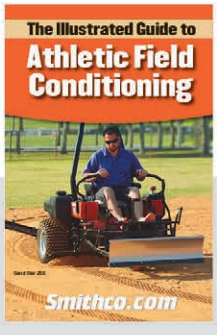

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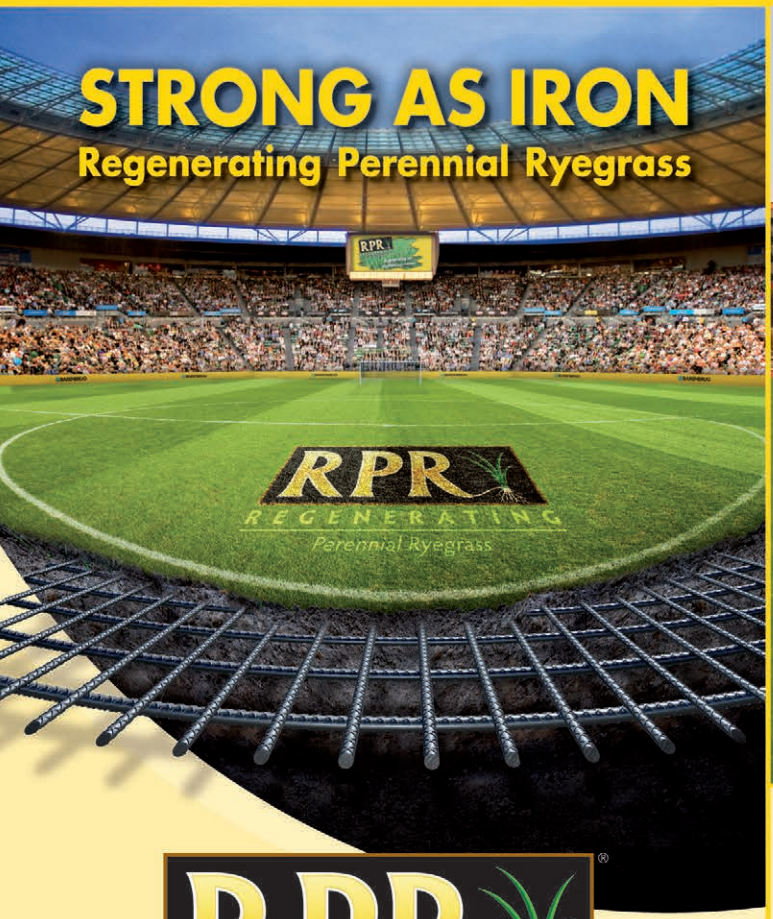

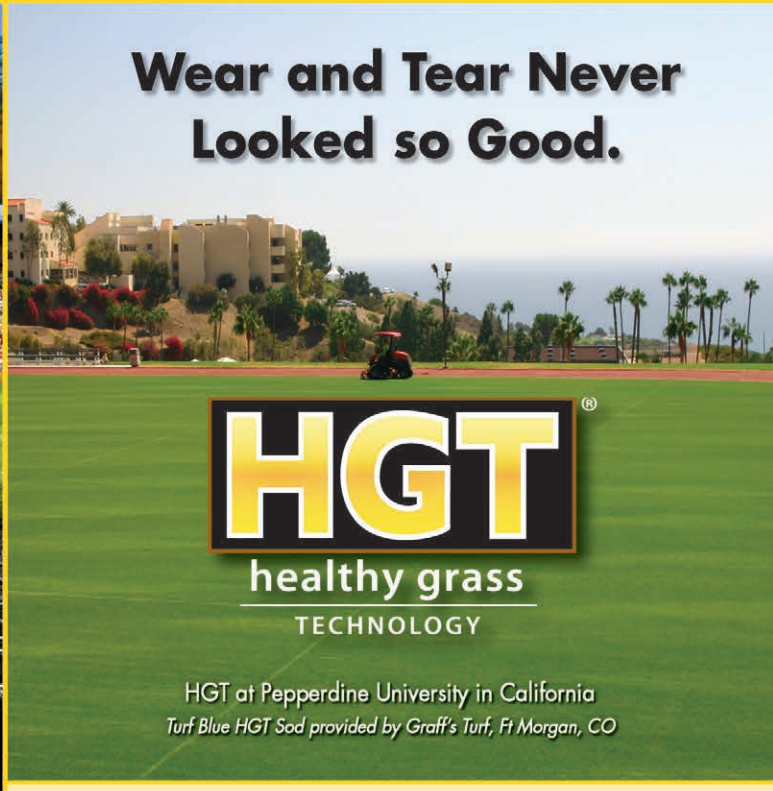

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