SportsField MANAGEMENT

Formerly SportsTurf *magazine*

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Community Pride

Schools and Parks Softball Field of the Year: Open Space Park, City of Sioux Center, Iowa

SportsTurf MANAGERS ASSOCIATION


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Editor's Note

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I originally had another topic in mind for my Editor's Note this month. But as I write this (in mid-March), our world is rapidly changing to deal with the situation facing all of us. As we all navigate these uncharted waters, I can assure you that *SportsField Management* will strive to bring you a sense of normalcy amidst the challenges you may face.

I am lucky to be able to do what I do — write, edit, produce and post — from wherever I have a WiFi connection. So, the rest of the *SportsField Management* team and I will continue to provide you with the information needed to do your job of providing beautiful and safe athletic fields.

For daily news and quickly evolving stories, be sure to check out the *SportsFieldManagementOnline.com* website and our affiliated e-newsletters.

Also, I would like to hear from you. As I endeavor to keep the pulse of the industry, please feel free to reach out to me to share your insights into the challenges you face and how you are approaching your current situation. I welcome any photos you might like to share; as well as any stories, story ideas, or questions you may have. You can always reach me at *jkmitta@epgmediallc.com*.

While everyone works at social distancing, it doesn't mean that you can't reach out to others in the industry by phone, e-mail or social media. One thing I regularly hear from STMA members is that one of the best perks of membership is the relationships with, and advice and assistance from, other members. As we feel more isolated than ever, it is important to remember the value of that community. If you are reading this and you are not an STMA member, please look to *www.stma.org* and know that you are not alone.

Fields and facilities will still need to be maintained, the grass will continue to grow, and plants still need proper nutrition and irrigation. I'm confident that all of you talented sports field managers out there will find a way to continue to provide beautiful, safe playing fields, and, whenever play resumes, the grass truly will be greener on the other side. **SFM**

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President's Message

Jimmy Simpson, CSFM
STMA President
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It is no secret to any of us that our profession is in the service industry. Each day, we are asked to provide a service to end users at our fields and facilities. I have witnessed firsthand many professionals in this industry dropping what they are doing to assist someone else. We help people carry items to the fields, provide directions, and even help change flat tires in the parking lots. To me, this willingness to serve others, so that have the opportunity to have a better experience or simply a better day, is the epitome of what our industry is all about.

To date, my favorite opportunity with this association has been working with STMA committee chairs to help build out their committees. The culture of service is evident by the roughly 200 volunteers who have raised their hands and said they want to play a dynamic role in the future of the STMA. Committee service is a great way to get involved with the association and share thoughts and ideas. I urge each of you to seriously consider joining a committee next year and share your ideas so the STMA can have your input firsthand as we try to grow and change together.

Another area that is immensely important to the growth of the STMA is our chapter network. All 32 STMA chapters play a pivotal role in disseminating the goals and objectives of our association at a local level. No one knows or understands their local needs better than the chapters and their leadership. STMA chapters, much like the STMA committees, need your help to grow, foster ideas, and share information in order to accomplish our collective goal of advancing professionalism in sports field management and safety through education, awareness programs and industry development. Please reach out to your local chapter to participate in these vital organizations that need your help.

Ultimately, our association is only as good as the sum of its people. Nothing happens in a vacuum, and the service of sharing of your time and developing new ideas is a responsibility that we all share. Whether this takes place at the national, regional or local level is irrelevant; it's the effort that you are giving to our industry that is important. We are a service-oriented profession outwardly facing, and if we want to continue to grow and impact positive change in our industry, we must also continue that culture of service throughout the STMA as well. **SFM**

Collaborating in change together,
Jimmy Simpson, CSFM

OPEN SPACE PARK
CITY OF SIOUX CENTER, IOWA

This award is not only a great honor for the City of Sioux Center's parks staff but for our community and all the hard work that we, as a community, have put into working and collaborating together to not only make things affordable but also have high standards of safety and looks by combining our resources. This field falls under out joint use facility for the City of Sioux Center. This means the city owns the field, but all expenses (CIP) and maintenance are split three ways between the City of Sioux Center, Dordt University and the Sioux Center School District. We keep this field at the standards of a high-level NAIA college-level field, which allows the school district to have one of the nicest fields in its conference.

I love showing our community how working together in our industry is hard but should be the standard we live by to make sure our athletes are playing on surfaces and fields that can not only get the most out of each player but the players know when they step on the field they will be safe.

The community has also appreciated the effort to have this facility pass the STMA Environmental Facility Certification tests.

I want to thank you for the opportunity to showcase our field and what this field means to our small northwest Iowa community.

— *Lee Van Meeteren*

The Field of the Year Awards program is made possible by the support of sponsors Carolina Green Corp., Precision Laboratories, and World Class Athletic Services.

SportsField Management (SFM): Congratulations again on the winning field. What are you most proud of with this win, and/or what do you think stands out most about the winning field?

Van Meeteren: I couldn't be more proud of the crew. We have had a very dedicated crew for many years, and this award allows everyone else to know how hard they work and how much pride they take in doing their job well. I am also proud of the relationships we have with Dordt University, Sioux Center School district and City of Sioux Center in working together to provide some of the best fields the players get to play on.

What stands out for me is our ability to work together in this community of less than 8,000 people, and provide a safe, beautiful field for our teams to call home; but also for northwest Iowa teams to enjoy when they come to Sioux Center to play.

SFM: With hosting Dordt University softball games, high school

Category of submission: Schools and Parks Softball

Field manager: Lee Van Meeteren

Title: Parks Director/ Head Grounds Superintendent

Education: University of Sioux Falls

Experience: Worked 10 years of lawn care and also three more years of ownership of a lawn care service. I have been in current position for four years as parks director and head grounds superintendent after being the assistant for eight years. I have served on the Iowa Chapter STMA for six years (currently past-president).

Full-time staff: David Egdorf and Colton Warning

Students/interns, part-time and seasonal staff: Kyle Cleveringa

Original construction: 1988

Turfgrass: For the past 12 years we have been introducing at 98-percent pure bluegrass seed from United Seeds called Grid Blue. It has Arrowhead bluegrass, Jackpot bluegrass, Blue Note bluegrass, Nu glade bluegrass and Rugby II bluegrass.

Rootzone: Silt loam

Overseed: We overseed every fall after all activities are complete with our United Seeds Grid Blue variety. We overseed with a rate of about 5 pounds per 1,000 sq. ft. We like to keep introducing new plants.

games and some middle school games, what are the biggest challenges you face with the Open Space Park softball field?

Van Meeteren: The hardest challenge is not the games but all the practices. In most years, this field will be played on from March through July every day if weather allows, and again from the end of August until the middle of October. We study the schedules often and look for longer away stretches to get work done; but we have gotten pretty good at doing the little things often so projects don't need long periods of time to complete.

When we do look at games of different levels, we need to understand the rules for all of them. Field conditions need to be different for the different levels, and each coach likes different things (and every year those things change depending on the players). It is a fun challenge to see what we can do every year.

SFM: I heard that news of your Field of the Year win was well received in Sioux Center. What was the reaction like from the local community and the local media?

Van Meeteren: We have a very close community, and everyone takes a lot of pride in making our community as beautiful as we can. To win a national award, the whole community feels like they have won this. This is truly a community award, and that is why we had such great feedback and reaction. But everyone who comes to the complex sees and understands the effort. Everyone goes out of their way to thank the crew and make us extremely proud to work in this type of community.

SFM: What advice do you have for other sports field managers?

Van Meeteren: When I first started work on fields, my boss at the time said, "Surround yourself with people who are smarter than you and never think you have it all figured out, because there is always something new to learn and try." So my advice is to be connected, join your local STMA chapter, join the [national] STMA, and get to know as many people as you can, because there is so much to learn.

For me, it's all about the skins area. I feel that 80 percent of the game of softball is played in that area, so 80 percent of your time needs to be focused on providing top-level skins areas. We all love growing grass, and outfields of softball and baseball are fairly simple unless you have a player who loves to dig holes. Having a beautiful carpet of grass and a great mow pattern is what everyone sees, but I love to see how the cleats of the players are using the dirt. Get to know your fields and find out where you need to spend your money, but every day do the little things to avoid the big projects.

SFM: What attracted you to a career in sports field management?

Van Meeteren: My attraction to sports field management came when I really got to know the challenges, but also understand the difference between a well-taken-care-for field versus fields that our athletes shouldn't even be on. What really got me hooked is the community of other sports field managers across the nation. I truly feel that I can call anyone at any time, and they

Judge's Comments

Lee Van Meeteren and his staff did a fantastic job with Open Space Park. His crew was rightfully commended with getting the field in pristine shape for the season. Lee and his staff worked with a tighter budget than the majority of his competition in his category, and I also like the challenge of having a joint community effort. His field is shared with the city, university and the park district. Lee and his crew should feel very proud to have Open Space Center a FOY. Hard work does pay off and does not go unnoticed.

— *Vince Cassata, parks foreman/sportsturf specialist for Glendale Heights (Ill.) Parks and Recreation; Licensed Pesticide Applicator; ILSTMA President*

I was impressed with the level of detail and professionalism exhibited by Lee and his staff at the City of Sioux Center. They face challenges not only from a budget standpoint, but also harsh weather conditions coming out of the winter months. In spite of this, they provide a high-quality playing surface that is clearly appreciated by the athletes who get to step onto the field. They employ a sound maintenance program to address wear areas and to stay ahead of disease pressure. The result is a safe, playable and professional field.

— *Jeff Langner, brand manager at Turface Athletics*

Editor's Note: A panel of 11 judges independently scored Field of the Year entries based on playability, appearance of surfaces, utilization of innovative solutions, effective use of budget and implementation of a comprehensive agronomic program. We have asked the judging panel to provide insight into why each winning field was selected, and we will share those comments with the corresponding field profiles.

would take the time to listen and offer advice. We are all in this together, and there is no better feeling than knowing that, whether you're at a rec field or a professional field, we all have the same goals in mind.

SFM: Who would say are your mentors in the industry, and/or what is the best piece of advice you have received?

Van Meeteren: I have a lot of mentors, because I feel like everyone I meet is a mentor. But it comes down to four people for me: Brad Vermeer (my first boss); Kevin Vos from Pella, Iowa; Lynda Wightman; and Mike Andresen. All four took me under their wings, showed me the growth potential that I had, and pushed me to do everything better in my line of work. Be involved, understand what you are doing, stay strong in your faith with the Lord in the good and bad, continue to learn, and never stop teaching the ones coming behind you are words I would often hear. I have been a sports field manager for almost 12 years now; it's a little easier to look back now and see the impact that people have had, but also how mentors have become friends. Brad Vermeer and I would often take a few minutes in the winter and just talk life - the good and the bad, marriage, and everything else you can think of. He was always the man I looked up to in order to keep my mind and eyes focused on the Lord, and I can't thank him enough for being that leader for me.

The most important advice I have gotten in the industry is to always be thinking about player safety. Everything we do on our fields has to do with what is best for the players, so thinking about safety has be our priority.

SFM: What's the greatest pleasure you derive from your job?

Van Meeteren: My job isn't just sports field management I am also the parks director. As a department we manage all parks grounds and all grounds the City of Sioux Center manages/owns. I love seeing how our work is a refection of how our community is viewed and how others in the community use the work we do as highlights of our community. I also like to see the part-time staff that we get to work with year after year grow, become well-rounded adults, follow their dreams, and have a small part in theirs lives so that they feel welcome to come back and visit anytime they want.

SFM: How has your career benefited from being a member of STMA?

Van Meeteren: STMA has been a major part of my career. I am one of those guys who didn't go to school for this. I went to the school of hard knocks and learning as I go. I have my 4-year degree in business administration and economics, but have always loved this line of work. I just didn't know that these types of jobs were even a possibility. I have used the Iowa chapter to really gain the knowledge and networking I needed to boost my career, and since have really seen the true benefits at the national level. I am starting to make great connections and hopefully make an impact at the national STMA level. I have served on the Iowa chapter board for nine years, and it has forced me to really understand the industry — from the corporate sponsors to trying to educate the people who want to get better at their jobs. **SFM**

Synthetic Turf Maintenance: Sports Field Managers Needed

By Michael Wear

As synthetic turf came into the athletic field, many sports field managers were wary and thought it would change the industry and they would become obsolete. It did, in fact, change the industry, but many of the same skills, practices and principles applied to natural grass field management are transferable to synthetic turf. Just as we had to learn the playing surface and all of its intricacies, and what did and didn't work for natural grass, we have to learn those same things for synthetic turf. Once we learn the intricacies of the surface, we transfer our natural grass talents to the synthetic aspect.

Just as with natural grass, there should be three key components of focus for any synthetic turf maintenance program:

- Safety
- Playability
- Aesthetics

So why perform maintenance on synthetic? Isn't it maintenance free? We perform maintenance on synthetic to achieve safe fields, maintain and extend the playability of the surface, and for the aesthetics of the field. Safety for the players, coaches and anybody who steps foot on the field. Playability is how the ball rolls, bounces, plays, etc., just like with natural grass. The aesthetics can be more difficult, and include teachable moments for players, coaches, parents and administrators. Synthetic turf maintenance has two aspects — regular and specialized.

"Regular maintenance should be based on the amount of use, the type of use, the area on which the field sits, and the time of year," stated Milo George, CEO of TurfTecs, McComb, Ohio.

The amount of use and intensity of use are key in determining which maintenance practices need to take place and when they need to take place. The area the field sits on, geographical location, determines if leaves or pine needles will be a big issue. What is the environment surrounding the field? What time of year is it? Does your dew point get low enough to cause deep infill freezes, making snow removal

impossible without tremendous damage to the field? Do you see a ton of rainfall? What are the summers like? All these factors need to be considered when developing a maintenance plan for any synthetic turf system.

Manufacturers have maintenance manuals, and the usage intervals vary by manufacturer: anywhere from 2 to 6 weeks, or 80 to 120 hours of usage. Therefore, usage hours increase maintenance through necessity, increasing the amount of time and money spent on the field.

What does the appearance of synthetic turf have to do with maintenance? What does your natural grass experience tell you? If you are new to the synthetic aspect of the industry, get out on your field daily!

"Excessive wear shows up much more slowly with synthetic turf than natural grass, so by the time you see the problem in synthetic turf, there's not much you can do," George stated.

Just as with natural grass, the "shadow principle" applies. The "shadow principle" is simply, how often is your shadow cast upon your field? If your field sees your shadow multiple times a day, you will be in tune to the nuances and needs of your field. You will notice the indicators of serious issues appearing before they become true safety hazards or cause severe field damage. The reverse is true. If your field only sees your shadow once or twice a week, or even more sparingly, it will be obvious due to lack of maintenance issues becoming big time and money expenditures because you didn't see it before it became a serious problem. Items that need to be watched are fiber wear, seam issues and ridges and valleys in the infill.

What key steps should your maintenance plan utilize? Cleanliness should be the first step in your synthetic turf maintenance plan. Based on the season, the environment and usage, daily litter pickup should be integral in your maintenance plan. Being out on your field daily walking it for litter, dead bug, leaf and any other foreign object cleanup allows you to get to know your field. It enables you to be able to inspect your seams for possible future seam issues or to catch them before they become larger and a safety hazard. Daily cleanliness gives the opportunity for you to do an inspection of your fibers and the wear they are seeing, and, in turn, helps you stay on top of hardness/compaction issues before they become safety hazards, and before irreparable damage is done to the fibers.

The biggest issue when it comes to maintenance of synthetic turf fields is under maintaining it, with a close second being over maintaining the field. The issues from over maintenance are as serious as under maintaining your synthetic surface, but the effects are noticeable much earlier than under maintaining. Over maintaining your surface leads to rapid fiber breakdown, which, in turn, causes you to lose more infill on a given day compared to a well-maintained field. The loss of infill creates hardness issues (compaction), which leads to things such as your field being so hard players are at a higher risk for traumatic brain injuries. It also results in increased fiber wear, and a shorter life of the field.

A lot of the same tools used during natural grass maintenance can be used for synthetic turf maintenance as well. Use a drag broom to brush or groom the field at the manufacturer-recommended hours to keep fibers standing up and infill in its proper place. A magnet should be dragged over the field at least twice a year, but more frequently if necessary. A magnet drag will remove debris from construction, screws, cleats, etc. Some great hand tools for maintenance include a carpet rake, leaf rake, and push broom — all of which can be used for leveling infill, raking/brooming infill in when topdressing smaller areas such as slide paths, bat-

ters' boxes and pitching mounds. For gum removal, a great tool is a spaghetti scoop. They're cheap, and when the gum is sprayed with gum-removal spray, the spaghetti scoop gets inside the fibers and scoops the gum out without damaging the fibers. Backpack blowers and leaf vacs are great tools for removing leaves, sunflower seeds and more. Other items to have on hand are tube sacks or buckets to fill with rubber so during a game or tournament you can quickly topdress areas that need it — such as a pitching mound — just like during a game on a natural clay infield. Brooming is done the same as dragging an infield. Start and stop in the same place. Never start in the same place for multiple days in a row, alternate the pattern, crosswise, 45-degree angles, etc.

The Synthetic Turf Council (STC) recommends an annual deep clean of your synthetic turf field. A sweeper vacuum is to be utilized to clean foreign debris and objects out of the infill. It stands the fibers back up, and reapplies the infill into its proper place to decrease compaction, and increase the health and aesthetics of the field. It accomplishes this through a rotary broom on the front of the equipment that flings debris and infill up onto a vibrating screen that drops the infill material back on the field, and collects the debris and foreign objects in a vacuum collection that is hauled away. This is a maintenance practice that should be done with specialized equipment by highly trained professionals. If you decide to buy your own equipment, it is not cheap, so find the right one for your needs, get the necessary training, and make sure it is done right. Improper sweeper vacuum maintenance can lead to severe field damage, costing a lot of money and shortening the lifespan of the field.

Synthetic turf fields need to be topdressed just like natural grass fields. Topdressing sand and rubber (or whatever kind of infill your field has) is done just like natural grass topdressing. Attach your topdresser to a machine that can operate and tow it. It doesn't matter whether you're utilizing a broadcast or drop spreader topdresser. Pre-mix your material and put the material down in what is called lifts. A lift is simply a pass over the entire field putting out the materials in the appropriate amount. 1/8" to 1/4" per lift. The biggest difference between synthetic turf and natural grass when it comes to topdressing is after doing a lift or two of topdressing you need to broom your field. If you are only doing one to two lifts (not more than about 3/8" of material in total), the broom you utilize for regular maintenance can be used to broom the material in. If it is more than that, utilize a Laymore-type piece of equipment with nylon bristles. The procedure is to do two to three lifts of material, Laymore the infill in at an angle pattern, then topdress two to three lifts and broom it again. Do this until your infill depth is at the proper depth, which is between 1/4" and 3/8" below the fiber height.

We perform maintenance on synthetic to achieve safe fields, maintain and extend the playability of the surface, and for the aesthetics of the field.

As part of your maintenance plan, you need to do regular depth and hardness checks on your field. I recommend doing it at least quarterly, but, depending on usage, it may be necessary to test more regularly or even less regularly. A Clegg hammer and infill gauge are not super cheap, but worth having on hand and learning how to properly use. If they are not in the budget, consider hiring a professional to come in and do these tests for you. This helps you keep up on infill and hardness issues appropriately maintained through topdressing, and gives you a third-party unbiased expert opinion that can be useful when requesting more funds for maintenance or replacement needs. **SFM**

Michael Wear is owner of Perfect Pitch Turf Solutions, a provider of solutions and services to improve the safety and quality of synthetic athletic fields.

CAN YOU IDENTIFY THIS TURFGRASS PROBLEM?

PROBLEM:
Discolored and trampled areas

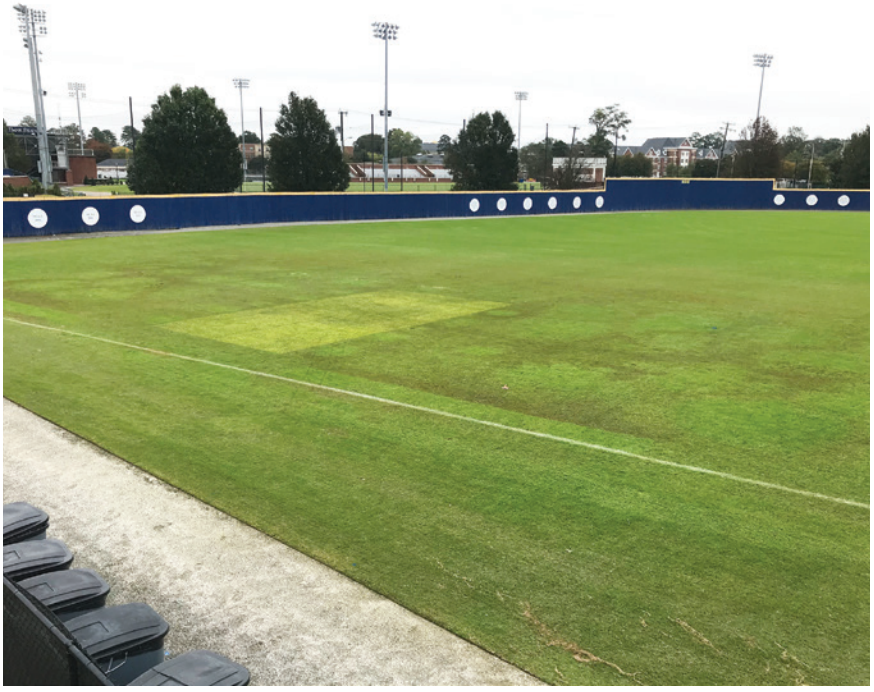
TURFGRASS AREA:
College baseball outfield

LOCATION:
Newport News, Va.

GRASS VARIETY:
Tifway 419 overseeded with perennial ryegrass

Answer on page 33

John Mascaro is president of Turf-Tec International



Breaking Barriers

Communicating with coaches and administration

By Marc Moran, CSFM

Many sports field managers would agree that working with coaches and administrators can be similar to trying to solve a Rubik's Cube. We often figure out one or two sides of that thing, while the others are left in chaos. Then we try to correct the chaotic sides only to realize we have messed up the sides we had already figured out. The pattern continues again and again. The reality of that comparison is that we keep trying. Just like with the Rubik's Cube, we want success or some level of it.

In order to solve any problem or overcome any challenge, we first need to identify what makes it a problem or a challenge. Five common things that I believe create problems or challenges for most sports field managers are as follows:

1. COMMUNICATION

One of the major challenges when it comes to working with coaches and administrators is the language barrier; you speak agronomy, they speak athletics. Often, you may have some experience in in speaking athletics, but are probably not fluent in the entire language. I personally can speak the various dialects of football, soccer, baseball and softball. As of this writing, I cannot speak lacrosse or field hockey. But I am trying to learn. Coaches and administrators often do not know the inner workings of agronomy, but they have you as a resource. The reality is that they will likely never learn it, but you have to do your best to translate what you know into a form they can somewhat understand.

Create a dialog about what goals coaches/administrators may have for a facility versus what your goals may be for that same facility. I know from personal experience that my goals for certain fields are often much different than those of the administration. So, at some point, it seems like we are pulling in different directions.

Take the time to communicate your ideas and goals with those administrators and coaches, and come to some sort of understanding as to which outcome is best. Sometimes

Damage sustained from repeated wear inside the lacrosse crease on a practice field. All photos provided by Marc Moran, CSFM

Practice crease painted in a sideline-to-sideline layout to give an alternate direction for traffic.

Four-way paint layout on a practice field to help reduce traffic. Crease usage is rotated every day.

the ability to compromise will offer gains for you far into the future. Be a part of the team.

Often, we become emotional when coaches/teams create undue damage on "our" fields, and we typically take it personal. It is important to take emotion out of the dynamic and use that opportunity to interact with a coach and take action through education. Be a teacher and explain what has happened and what steps could have been taken to avoid it and prevent it from happening again. Be genuine in your approach. Ask how their team is doing or recognize a big win or a tough loss in conversation before you discuss what challenges they may have presented you or your staff. Take a personal approach, learn their names, and treat them with a level of professionalism that you would want them to extend to you. We often miss that simple opportunity to build that easy connection and let them see you as a resource, not as a fussy ol' groundskeeper.

2. HABITS OF COACHES

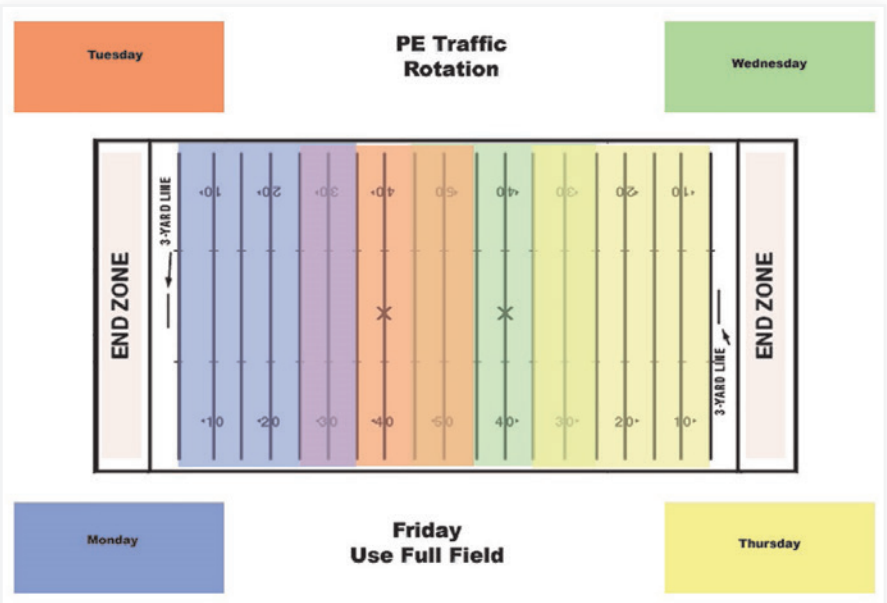
As you look at your interactions and communications with coaches, think of ways that you may be able to help reduce your challenges by proactively helping coaches break bad habits. We have all seen what happens when baseball coaches repeat the same dragging patterns on infields that they learned from their coaches who learned their coaches. After one or two seasons, you have huge infield lips and crazy hops. They come to you in a panic and want to know what *you* can do to fix it. You may want to say, "Step one is to get you off of the machine we use to drag the field!" But we all know that is not the approach or the effective answer. As stated, take that time to teach a coach a new technique. Coaches are used to evolving as coaches. That is why they attend coaching clinics and conferences. They seek more knowledge and new techniques to give their team an increased advantage in some phase of the game. Take that same approach when you look to help them improve their daily field work routines. I have grown as a sports field manager because I have taken the time to observe a few practices and games. I try to think of how I would set a drill up or run a similar practice, but from the mindset of a sports field manager. Do I need to paint a full field if only half is being used? Can I turn a field another direction at some point during the season? Do I need to paint a line if a cone will suffice? If you can share some ideas with coaches, and simply state, "I was watching your practice, and I was curious if it would help if I…" and slip your idea in there to them. In my experience, they rarely tell me no. Build the relationship based on helping them be successful.

3. POOR CONSTRUCTION/ FACILITY DESIGN

Many of us have inherited problems from initial construction or poor design. Many times, we have been forced to live with them or find ways to work around them through innovation and ingenuity. Anyone who still manages a hydraulic irrigation system can attest to that. The best way overcome many of these facility challenges is to reach out to your fellow sports field managers or create industry partners who can give you

good advice. If using an industry partner, make sure your athletic administration is invited in for the meeting or walk-around of your facility. If your administration hears what you are saying from an industry partner, they may be more likely to listen or look at the issue with higher level of urgency. At the same time, explain to them that having a person like yourself on new construction projects or renovation can often save them considerable money in the long term. Try to get a seat at the table whenever decisions about the facility for which you are responsible may be up for improvements or renovations.

Soccer/lacrosse stadium prepped for a soccer game. Teams are not permitted to warm up in goal areas during pre-game. Goals are shifted and set back in place for the game.



Traffic plan we have for our Physical Education staff in order to reduce the concentrated traffic PE classes can put on our practice fields on a daily basis.

4. HANDS-ON VS. HANDS-OFF COACHES

Many of us have coaches who are totally hands off and basically show up, run practice and go home. If you are not prepared for that, then that can create a considerable amount of frustration — especially if you have been accustomed to a coaching staff that was very hands on. If you know the score in the beginning, it will often reduce your stress and frustration because you have the ability to plan and prepare for the work that you often counted on others to do. On the flip side, you may have very hands-on coaches who may need to be reined in a little because they become impulsive and quick to move on an idea when they may not have the complete picture. In the same light, you may learn something you never knew you would learn because a coach had an idea that you never thought about. I never would have suggested grass base paths for our baseball field, but my baseball coach in 2000 decided he wanted to do it and I can easily say it has been awesome.

5. BUDGETS

The last major obstacle is often budget. We never have enough and always want more. The reality, at least in a school setting, is that the purpose of the school is to teach, plain and simple. Athletic administrators are often reactive and make purchases because they have to make a purchase. They typically have about a dozen or so teams that each require funding at some level for uniforms and equipment.

They must pay for transportation and referees, as well as manage and staff games/contests. Throw the management of indoor and outdoor facilities into that as well, and that is a lot of pieces to a pre-determined pie.

Endzone layout and paint scheme for "Armed Forces Night" in the fall of 2019.

Through good planning and preparation, we can often give administrators a good idea of what we may need to be successful. We also need to make a list of "must have" and "like to have." If the "like to have" gets kicked from the list, keep putting it on the list in the next funding cycle, find ways to fundraise for that item, or work with coaches to help slide that from "like to have" to "must have."

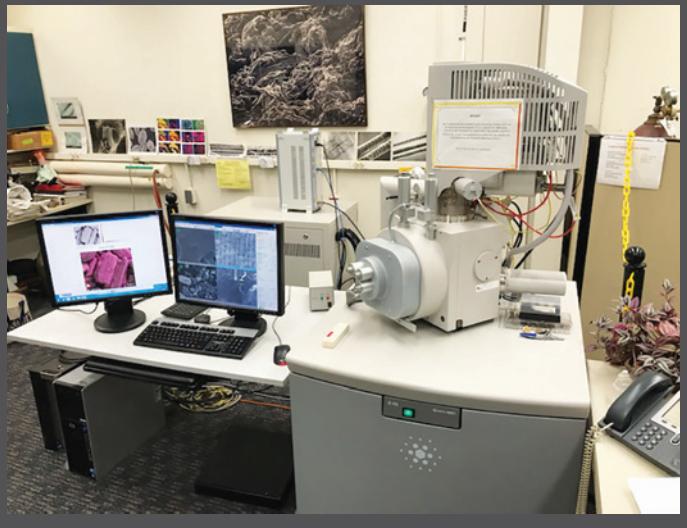
When it comes down to it, one of the biggest things we can do for ourselves is to be effective communicators, innovative teachers and forever a professional. Use the resources that the STMA and its local chapters provide to help with education and innovation. Reach out to our peers to build relationships and seek advice. Be passionate and know that your role as a sports field manager affects the lives of the athletes who use your facility. **SFM**

Marc Moran, CSFM, is turf science teacher at Atlee High School, Mechanicsville, Va.

Basics of Turfgrass Soil Habitat and Microorganisms

By Bruce Suddeth, CSFM

The turfgrass soil system is a highly complex and infinitely changing habitat. Although studies of soil microbiology have been conducted for decades, scientists have recently made considerable progress understanding microorganisms and their function in soils supporting turfgrass growth. The following will examine basic soil properties and effects of soil microbes, basic review of microbe types and their functions, as well as how we can improve soil microbial activity and improve turfgrass vigor.



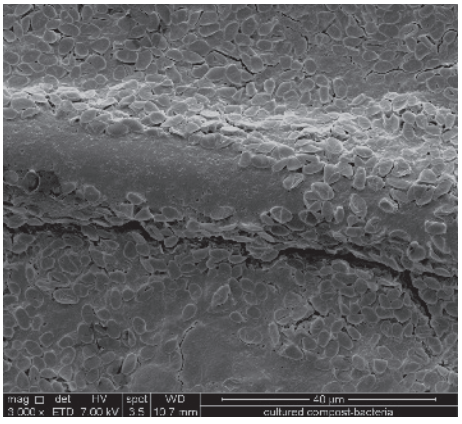
Scanning electron microscope at Milliken Research Center
All photos provided by Milliken Research Center and Technician Kathy Beck

SOILS

Soil supports plant life and contains organic substances required for plant and animal growth. Soil is defined as a mantle of weathered rock, which in addition to organic matter, contains mineral and nutrients capable of supporting plant growth. Soil is a collection of five major components: minerals, organic matter, water, air, and living organisms.

MINERALS

Minerals contribute less than 50 percent volume of a soil. Minerals are derived from the disintegration and decomposition of rocks. Nutrient availability, aeration and water retention are influenced by the mineral content. Stones, gravel, sand, silt and clay are formed from minerals. The clay portion of a soil often has the greatest influence on fertility and drainage because the chemical properties are influenced by surface area. Clay particles also have the greatest influence on microbial activity. Silt and sand have a lesser influence on soil chemistry and biological activity. Of all the soil particles, clay has the highest cation exchange capacity (CEC), which is the ability of the soil particle to hold positive ions. The CEC can alter soil physical properties, it also affects soil pH and fertility. Most plants obtain K^+, Ca^{2+}, Mg^{2+} from exchangeable sites. The exchange capacity of a soil is determined by the type and amount of clay and organic matter in the soil. The CEC of organic matter far exceeds clay. Organic matter is composed primarily of carbon, hydrogen, and oxygen, and is chemically heterogenous. In organic matter, hydrogen (H^+) ions are strongly held under acid conditions and are not easily replaced by other cations. As the pH increases, the H^+ ions are gradually replaced by other cations. Therefore, the CEC of organic matter is pH dependent. The exchange sites of a soil are important because they can attract or repel anions and cations but can also attract and repel charged organic molecules. Because the surfaces of microorganisms are composed of organic molecules, which are positively or negatively charged depending on the soil pH, soils can attract or repel microorganisms. This means soil microorganisms can chemically adsorb or bind to soil particles. How this is done is not fully understood. At typical soil pH values (5-8), soil microorganism is negatively charged. There likely are a variety of mechanisms responsible for microorganisms chemically adsorbing or binding to clay and organic matter.



Bacteria culture as seen through a scanning electron microscope at 3,000x magnification

ORGANIC MATTER

Typically, organic matter makes up 3 to 6 percent of the volume of plant and animal materials in the soil. Humus is derived from organic matter, and is the substance left when organisms have modified the organic matter. Humus is the colloidal remains of organic matter, and contains the organic carbon and nitrogen needed for microbial development. Humus is the major food reservoir for microorganisms, and is composed of plant material modified by microbes. It contains C, H, O, P, S, N and small amounts of other elements, as well as various polymerized long chain organics. Humus is found in the "A" horizon of a soil profile. It is composed of a heterogeneous group of substances of unknown parentage and chemical structure.

AIR AND WATER

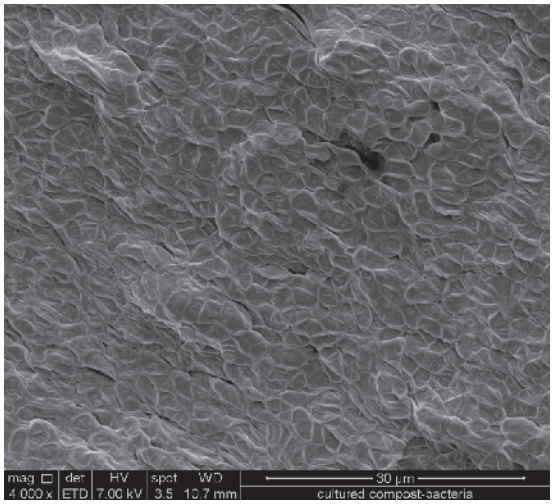
Air and water account for approximately 50 percent of the soil volume in an ideal soil. Compaction will reduce the percentage of air and water space, therefore, these percentages can change with varying traffic and soil types. Pore spaces regulate the volume of a bulk soil not occupied with soil particles.

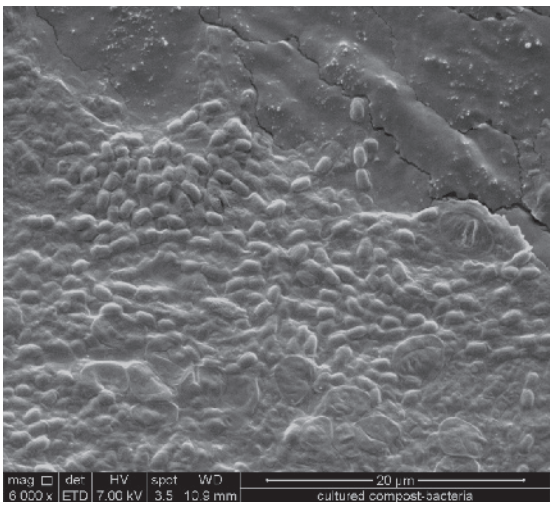
MICROORGANISMS

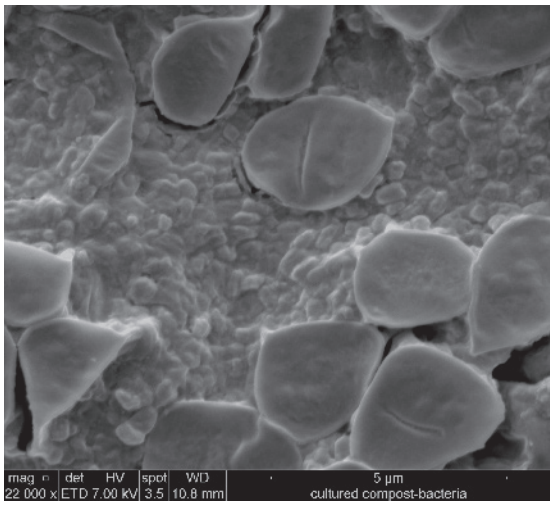
Living organisms make up the fifth, and often the most underemphasized, component. Generally, less than 1 percent of soil by volume is living organisms. Soil organisms are critical for turfgrass growth and many important processes. The microbes can be divided into two major groups: microflora, which are plants; and macrofauna, which are animal parts.

When evaluating soil biological activity, it's clear that microflora (bacteria, actinomycetes, fungi, and algae) are most important. Microflora contribute 60 to 80 percent of the total soil metabolism, and are irreplaceable in many essential processes. Each organism contributes to the whole soil life cycle.

Differences in moisture, organic matter, and pH can affect populations of organisms. Estimates have been shown there are approximately 100 to 200 million bacteria in each gram of soil. Other estimates conclude there may be an average of 930 billion organisms present in one pound of soil. The weight of microbes total 70 pounds per 1,000 ft2 of area. This large quantity of soil microbes serves many essential functions in their lifetime. When dead, the microorganisms serve as a nutrient source. One hundred pounds of dead microorganisms can provide 10 pounds of nitrogen, five pounds of phosphate, and two pounds of potash.







Bacteria cultures as seen through a scanning electron microscope at 4,000x (top), 6,000x (middle) and 22,000x (bottom) magnification

BACTERIA

Bacteria are the most numerous of all the microbial populations in the soil. Bacteria have the largest capacity for rapid growth and vigorous decomposition of many natural materials.

Bacteria can be categorized as indigenous or invaders. Indigenous bacteria are primarily responsible for the biochemical function of the soil community. Invaders enter the soil through diseased tissue, manure and sewage sludge, and do not contribute significantly to the ecological activities of the community. A segment of the bacteria population grows readily when organic nutrients are added to the soil. They decline once the food has been exhausted. Other bacteria feed on less available nutrients such as soil organic matter, plant residues or components of other microbial cells. These types of bacteria usually don't deplete their food sources, grow slowly, and don't fluctuate in population as much.

Bacteria can also be classified as aerobic (needing oxygen to survive) or anaerobic, (grow in the absence of oxygen). Bacteria are rarely found in free soil water. They are held adsorbed to clay and humus particles and in slimy excretions. The number and type of bacteria are many and dependent on soil type and cultivation practices. There are almost 200 different types of bacteria in the soil. Bacterial numbers are usually greater in grasslands than in farmland because of high root density, plant debris, and useable organic matter.

FUNGI

Fungi provide a significant portion of biomass because of their large-diameter hyphae in most well aerated cultivated soils. The individual hyphae strands are referred to as mycelium. Fungi are dominant in acid soils, but can adapt to different habitats. Fungi do well at a pH of less than 4, primarily due to less competition for food. One major function of fungi is their ability to degrade cellulose, pectin, lignin and starches. This degradation aids in humus formation. Especially important in turf is the fact that some fungi can cause plant disease. This is only by a very small percentage of fungi that this occurs.

A form of fungi that is specialized and is of benefit to turfgrass is mycorrhizae. Mycorrhizae are specialized soil-inhabiting fungi that exist symbiotically with turfgrass roots to benefit both. This fungus is usually only found in the immediate local of a root. The fungus can either be ectotropic (penetrate between root cells) or endotropic (directly penetrating host cells). In turfgrass, endomycorrhizae are the most important. This fungus allows nutrient and hormone exchange between it and the host plant. Even though the fungus is parasitic, it is not pathogenic. Endomycorrhizae reproduce by spores, and can only complete their life cycle by infecting live roots. In some plants, an increase in drought tolerance has been associated with mycorrhizae. This was related to the increased uptake of water and nutrients.

Actinomycetes are microorganisms that produce slender, branched filaments that develop mycelium. Individual hyphae are similar to fungi but are narrower. Actinomycetes participate

in the decay of resistant plant and animal tissue, formation of humus and humus type compounds, and the rotting and heating of hay, composts, and manures. They are second in abundance only to bacteria. Actinomycetes are more common in dry soils and with pH greater than 5. Populations of actinomycetes are greater in warmer climates.

ALGAE

Algae is common in habitats where there is sufficient moisture and light. Soil algae include green algae, blue-green algae, diatoms, and yellow-green algae. In temperate climates, green algae and diatoms are most dominant. Green algae are usually unicellular rather than filamentous and dominate acid soils. Algae do not contribute considerably to soil biochemistry and fertility but do contribute to the soil structure.

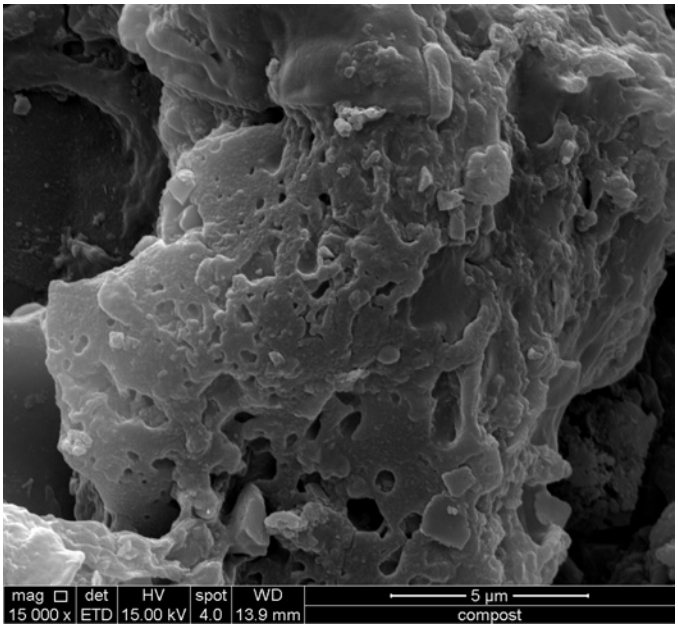
SOIL ENVIRONMENT AND ORGANISMS

MOISTURE

Microorganism are greatly affected by environmental conditions. The principal factors include moisture, temperature, aeration, pH, and organic matter content. Soil water is important for several reasons. Water is a key component of the protoplasm of microorganisms. Without sufficient moisture, soil organisms either die or go into a period of dormancy. The optimum moisture content for aerobic organism is about 50 to 75 percent of the soil moisture holding capacity. Fungi and actinomycetes are infrequent at soil water contents greater than 85 percent, due to the lack of free oxygen. Algae do best under cool, wet conditions.

TEMPERATURE

Microorganisms are diverse and exist over a wide range of soil temperatures. Each has an optimum temperature for growth. Microbes are most active at soil temperatures of 74 to 95 degrees Fahrenheit. Soil microbial populations fluctuate from season to season because of temperature and moisture variations throughout the year. The number of active bacteria, fungi, and actinomycetes is usually greatest during spring and fall. They decline during the hot dry summer period. Most microorganisms and those important to growing turf, are strict aerobes. They are most abundant under well aerated conditions.



Compost as seen through a scanning electron microscope at 15,000x magnification

"Soils rich in carbon-containing materials such as humus and organic matter favor increased populations of microorganisms."

PH

The optimum pH for most bacteria is near neutral. Liming acid soils will greatly increase bacterial populations. The actinomycetes population is most abundant at pH 6.5 – 8.0. Fungi tend to dominate low pH environments because they out compete other organisms, not because these low pH's are optimum.

ORGANIC MATTER

Soils rich in carbon-containing materials such as humus and organic matter favor increased populations of microorganisms. After the addition of organic matter, bacteria and fungal flora usually dominate initially, with the actinomycetes becoming active during the latter stages of decay. Fungi must obtain energy from oxidizing organic materials. Increasing organic matter content increases the size of the fungal population and alters the composition.

Active bacteria and fungi can occur as deep as 60 to 80 inches below the turf surface, but most of microbial activity takes place in the top several inches.

BENEFITS OF SOIL ORGANISMS

A prime function of soil organisms is to cause decay or oxidation of organic matter from the earth's surface. During this decay process, several beneficial reactions take place:

1) Nonsymbiotic nitrogen fixation by organisms living in soil independent of other organisms. These organisms fix 10 to 20 pounds of nitrogen per acre per year from the atmosphere.
2) Symbiotic nitrogen fixation by organisms living in nodules of legumes fix nitrogen from the atmosphere and transfer it to the soil when the plant dies.
3) Ammonification where, during breakdown of organic matter, certain organisms free ammonium to the soil. This is important because it is how all organic nitrogen is released to the soil.
4) Nitrification whereby organisms convert ammonium to nitrate. Excess ammonium can be harmful to some plants. Some of the hydrogen ions from the ammonium are left in the soil solution and reduce the soil pH.
5) Phosphorous mineralization where soil organisms convert organic phosphorous to orthophosphates.
6) Sulfur conversions as soil sulfur is held in organic forms. Organisms convert sulfur to sulfate that can be used by plants.
7) Other reactions. Organisms during the decay process release other elements to the soil, such as Ca, Mg, K and micronutrients.

SOIL NUTRIENTS

In order for microorganisms to function and grow properly, they must have an adequate supply of nutrients. Of all the requirements, the need for carbon is the single most important consideration in the structure and function of biological organisms. Plant tissues and microbial cells are about 40 to 50 percent carbon on a dry weight basis. Both plants and microbes must acquire a substantial amount of carbon for their survival.

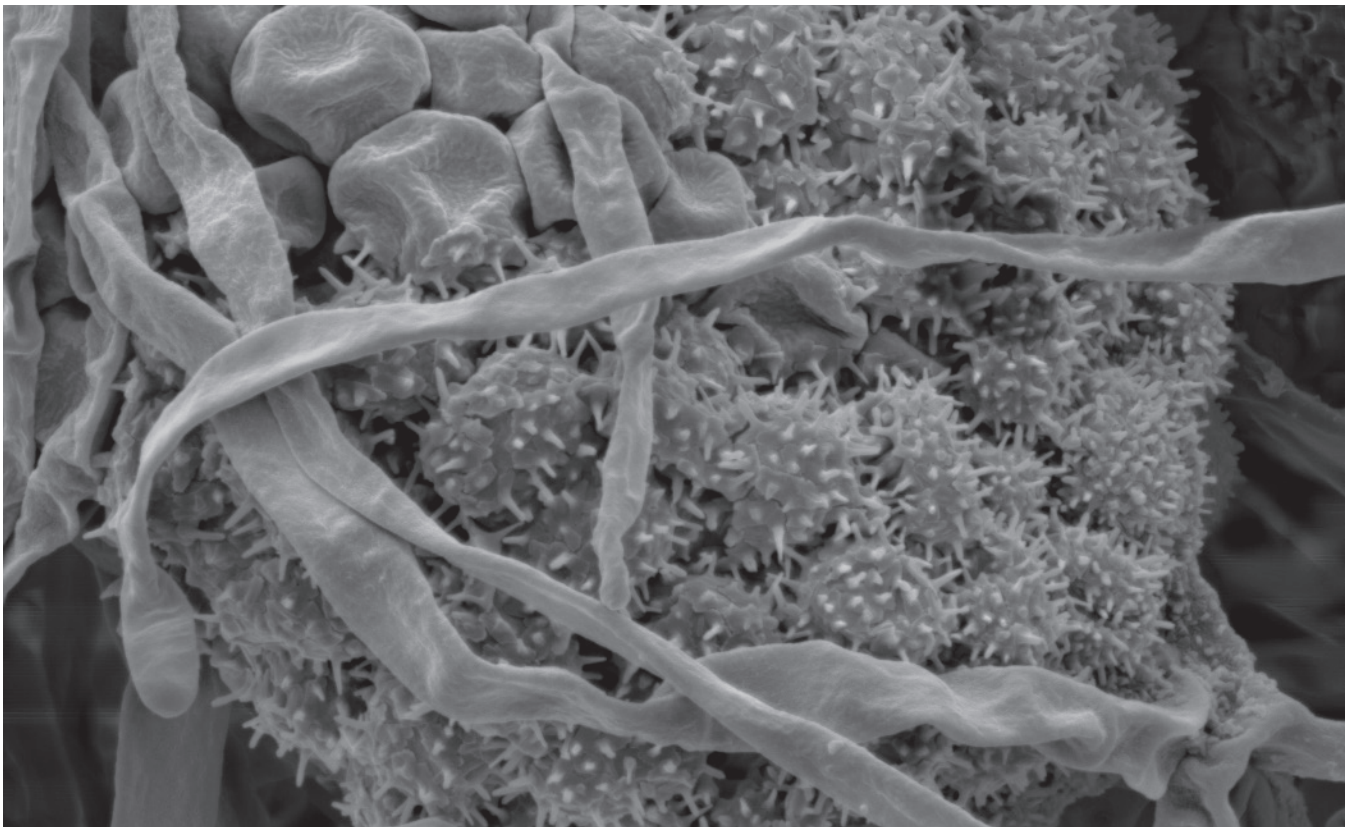
CARBON

Organisms can be divided into two categories based on how they obtain energy and carbon compounds. They are either autotrophs or heterotrophs. Autotrophs obtain energy from sunlight or oxidation of inorganic compounds and convert carbon dioxide (CO_2) to carbon for use. Algae, green plants, and a few bacteria use sunlight to generate carbon and energy. The glucose formed during photosynthesis serves as a source of carbon and energy released due to microbial activity and/or respiration.

Heterotrophic organisms require pre-existing sources of organic nutrients to provide carbon and energy. Fungi, actinomycetes, protozoa, and most bacteria are heterotrophic. They use existing energy sources such as cellulose, lignin, starch, sugars, proteins and hydrocarbons to obtain their carbon. Degradation of these materials releases energy, of which some is used to build microbial protoplasm. The energy released can be used to fuel reactions needing energy and may also be given off as heat.

The most important function of microbes is usually considered to be the breakdown of organic matter and the replenishment of carbon dioxide (CO_2) for photosynthesis. There are many sources of organic matter in a turfgrass soil system. Above-ground plant parts, roots, rhizomes, stolons, animal tissue and microorganisms themselves are all available sources. Plants are composed mainly of cellulose, hemicellulose and lignin. The older plants get, the less water, fats, sugars, proteins and other mineral elements they possess.

Microbes contain approximately 50 percent carbon. Twenty to 40 percent of the carbon from decomposition is used by microbes, and the rest is released as CO_2 or other wastes. As microbes take up carbon into their cells, they also take up other nutrients in a process called immobilization. These mineral nutrients are unavailable to plants until the microbe dies.



Fungi culture as seen through a scanning electron microscope at 6,000x magnification

Organic matter decomposition can be divided into three processes:
1) Plant tissue reduced by microbial enzymes.
2) Plant ingredients can be used to synthesize new microbes.
3) Final products of the reducing process are excreted into the soil.

A few conditions favoring rapid decomposition of plant residue and growth of microorganisms are as follows:
1) Low lignin content and small particle size.
2) Adequate nitrogen available or residue with low C:N ratio.
3) Near neutral soil pH for diverse microbial populations.
4) Adequate soil moisture and aeration.
5) Warm soil temperature with an optimum of 86 to 113 degrees Fahrenheit.

NITROGEN

Nitrogen is essential for proper microbial growth and organic matter decomposition. The amount of nitrogen varies among plant tissues. Nitrogen-rich materials (low C:N ratio) decompose rapidly, while those with high C:N ratios (>30:1) decompose slowly because a large amount of carbon has been added without a sufficient supply of nitrogen to propel microbial activity. Microbes may use soil nitrogen to decompose high C:N materials and result in a nitrogen deficiency, which requires the addition of fertilizers. This problem usually does not exist in turfgrass, except when soil amendments are incorporated prior to establishment. For example, sawdust can have a C:N ratio as high as 200:1, meaning some nitrogen needs to be added to it for proper breakdown by soil organisms. Turfgrass clippings, with their high nitrogen content (4 to 6 percent) compared to other crops, should be unaffected by the C:N ratio.

ENHANCING SOIL ORGANISM ACTIVITY

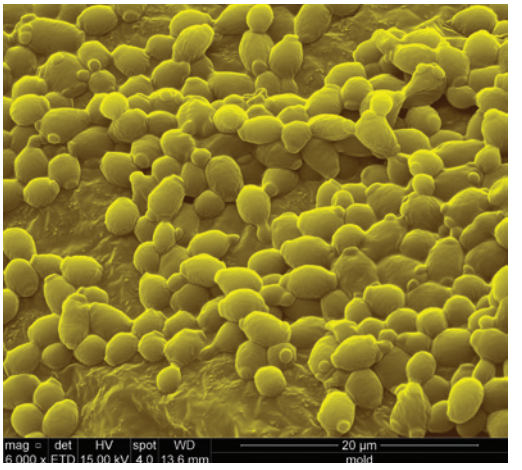
Microbial growth starts off slowly then increases rapidly. The amount of time for a population to double is known as the generation time. Generation times can vary with the organisms and environment. Microbe growth occurs only a portion of the time, because, at some point, nutrients become limiting or waste products accumulate to toxic levels. The death of existing organisms equals the production of new organisms and the population holds steady. Temperature and pH are the most influential factors affecting microbial growth outside of the food source.

What should a turfgrass manager do to enhance microbial growth? What products or methods can be used? What to do next?

BIOSTIMULANTS

Biostimulant is a loose term for products that include; microbial inoculums, food for microbes, soil conditioners, plant hormones, and other non-nutritional growth-promoting substances. The group of biostimulants called plant hormones may contain one or more of the following: cytokinins (regulates rooting), gibberellins (regulates cell elongation/division), auxins (regulates cell elongation), abscisic acid (regulates stomatal activity), and ethylene (regulates seedhead production). Most physiological processes in plants involve an interaction of several hormones, and individual hormones have several functions. Normal hormone production can be influenced by environmental and cultural stress.

Other types of growth stimulants on the market contain humates or humic acid. These are naturally occurring compounds that are the end products of biological decomposition of organic matter. Humates or humic acids claim to increase CEC, increase microbial activity, and chelate micronutrients.



Mold as seen through a scanning electron microscope at 6,000x magnification

COMPOSTS

The most promising method of managing and enhancing the activity of soil microbes is with composted organic matter in wastes and other materials. Composts have been shown to add an active microbial component to soils and stimulate those microbes already present in the soil. Commonly used composts include brewery sludge, yard wastes, poultry litter, animal manure, and more. There have never been as many commercially available products to the turfgrass industry, so how do you choose the appropriate product for your application? First, start with the product label. Products registered with the EPA can legally justify claims of the product. Some products are marketed by independent research. Understand independent, scientific research that supports the products. Know who conducted the research, under what conditions, and the relevancy to turfgrass systems. Check to see if the results have been published in technical reports or journals. Conduct on-site testing that is relevant to your applications. Also, test at several locations representative of varying conditions and use untreated controls in side-by-side comparisons.

Turfgrass management is an infinitely evolving science. As we increase our understanding of the microbial community in turfgrass systems, more products will come to market. Some will be useful, some not. Independent research will be essential to the development of effective products.

The importance of a strong microbial community is without question. The effectiveness of various products available to stimulate microbial activity can always be of question. The turfgrass manager should become familiar with soil microbiology and processes, check for independent research to support product claims, and test products to make sure they are effective and are economically feasible. Even with these products, don't forget the basics of turfgrass management: adequate sunlight, drainage, air circulation, proper fertility, good water management, traffic control and cultivation. **SFM**

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Traditional vs. 2-wire Irrigation Systems

Traditionally wired and 2-wire are both types of irrigation systems. However, they are fundamentally very different types of technology.

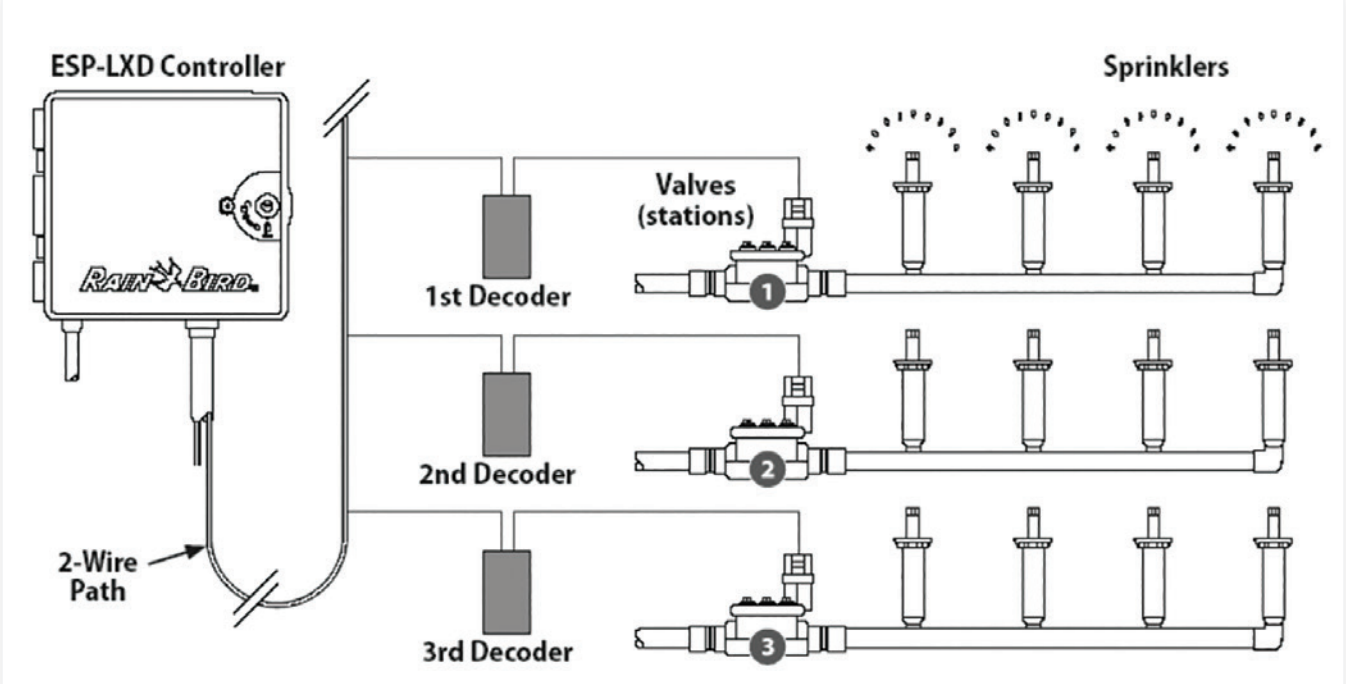
A traditional irrigation system involves a controller sending voltage down a wire path, which activates a solenoid, in turn opening a valve allowing water to flow to the sprinkler heads. Decoder, or 2-wire, systems involve a different kind of architecture, which I will outline later in this article. Both types of systems possess inherent qualities that can make them better or worse for a specific application. Therefore, understanding the application will help you determine which type of system would be a better fit.

Traditional irrigation systems require one dedicated wire for each zone valve, plus a common wire linking all of the valves. This can add up to a lot of linear feet in copper wire. Most decoder systems only have one 2-wire path linking all of the devices (valves, sensors, pump relays, etc.). Therefore, the size of the irrigation system can help determine which type of technology should be installed. Once a system gets more than 30 to 35 zones, it becomes less expensive to install a 2-wire system.

While cost will almost always be a consideration, another factor that can give traditional systems an advantage is the relative simplicity. Since the wiring architecture is very basic, almost any irrigation contractor knows how to install and troubleshoot them. Whereas a 2-wire system forces us to choose from a smaller pool of contractors. Oftentimes, this will drive up the cost of the system.

One distinct advantage to 2-wire technology is its expandability. If a new section of irrigation needs to be added to an existing 2-wire system, the path can be tapped into and new irrigation can be added. Also, due to the fact that most 2-wire controllers can handle

Editor's Note: This article was provided by Rain Bird, and was written by Heath Traver, CID, CIC, CLIA. Traver is a specification manager for Rain Bird in the Northeast United States, and is licensed to practice irrigation in the state of New Jersey. He can be reached via e-mail at *htraver@rainbird.com*

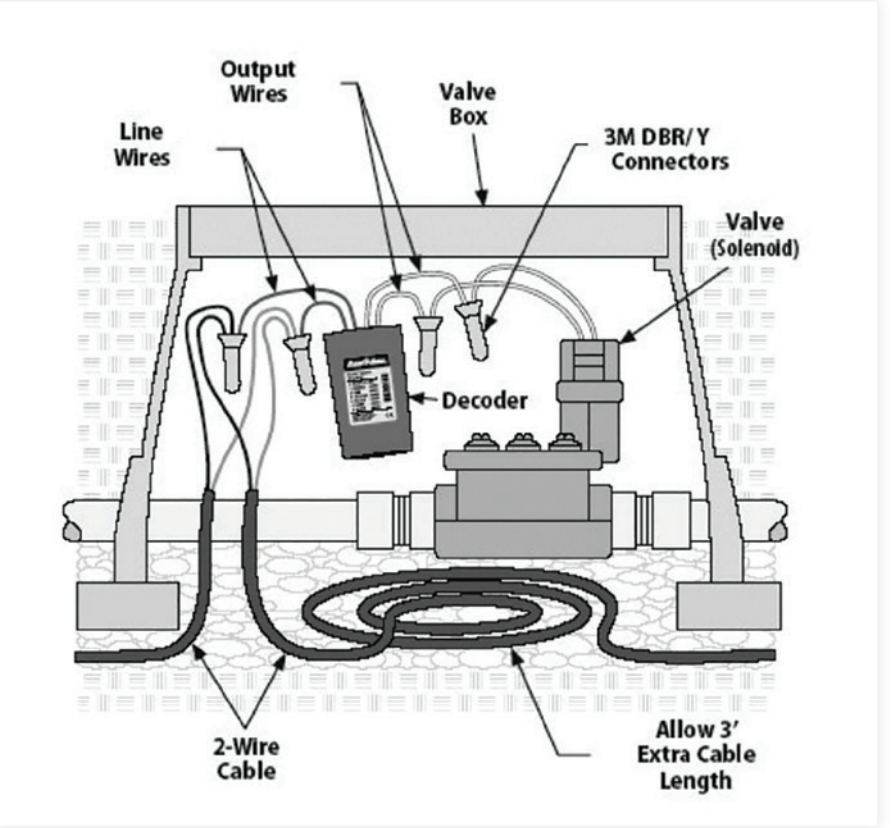


Typical Decoder and Valve Operation

hundreds of zones, adding zones to an existing system is rarely an issue. When a traditionally wired system needs to be expanded, new wires will often need to be run back to the controller, making it cost prohibitive.

A 2-wire controller is always sending voltage (usually 24-30 volts AC) down the 2-wire path in order to communicate with the components in the irrigation system. In order for the controller to talk to each device, there needs to be a decoder between the 2-wire path and its respective device. Each decoder has a unique address that acts as a telephone number. So, when the controller wants to open a valve, it dials up the specific decoder and tells it to send voltage to the solenoid, opening the valve.

2-wire technology has been around for many years in the golf industry, but is only recently



gaining traction in the residential/commercial market. This increase in use is being driven by a few factors: the ever-increasing cost of copper wire, the decreasing cost of the technology, and the fact that more contractors are becoming familiar with it. Perhaps the biggest factor holding it back has been the apprehension of contractors who are unfamiliar with the technology and how to install it. As more contractors learn about the advantages of 2-wire, and become more familiar with installation and troubleshooting, the technology is being embraced.

One of the biggest advantages with this technology is the sharp increase in diagnostic ability. In a traditional system, the controller is simply sending voltage down the wire path. In a decoder system, the wire path is meant for communication. This enables the controller to use built-in diagnostics to check out the health of the system, and can signal an alarm if there are any issues with the decoders, solenoids or the wire path. Since the solenoids are after the decoders in the wiring architecture, traditional troubleshooting techniques (voltage and resistance) will not work. Instead, a clamp meter capable of reading 1.0 milliamps must be used to read the amperage draw from the downstream decoders. An accurate as-built is always very helpful when troubleshooting 2-wire, but a good clamp meter is essential.

Since 2-wire systems are always sending current down the path, any bit of exposed copper will inevitably corrode. Therefore, proper waterproof wire splices are critical. At least 90 percent of 2-wire issues are found at the splices, which should always be in a valve box and never be buried in the soil. Another essential component required to ensure the long-term health of the system is proper grounding. Decoder systems are very susceptible to lightning strikes. Therefore, grounding rods or plates should be buried every 500 feet or every 8 to 15 decoders, depending on the manufacturer's requirements. The general rule of thumb is to make sure the resistance between the wire path and the ground is less than 10 ohms. This will give the lightning a path to the ground, minimizing the potential damage to the system. Most manufacturers recommend grounding the controller as well.

As 2-wire technology continues to become less cost-prohibitive, the ratio of systems being installed will continue to shift toward decoder-based systems. Many believe that traditionally wired systems will eventually become a thing of the past. Regardless of what happens, we can always expect that new technologies will continue to influence how our respective industries will evolve. Embracing new technologies will be critical in ensuring that we are always getting better, not only as individual professionals, but also as a society. **SFM**

ANSWER

From page 17

The discolored and trampled areas on this overseeded bermudagrass college baseball outfield are the result of a wedding that occurred after the 2019 fall baseball practice season ended. This was the first wedding ever held on the field, as it was for the university's baseball coach who had been at the school for 19 years. The crew core aerated the field and overseeded on Oct 7 and 8, and the wedding was held on Oct 19, primarily in the outfield. The rectangular area is where the dance floor was located, and the green circles are where the tables were placed (keeping wear off the turf under the tables). The sports field manager noted that the happy couple and tent company were excellent to work with on the placement of the tent. The crew marked the irrigation heads and used their knowledge of where the lateral lines were located to avoid damage from the tent posts and tent anchors. The tent was placed as close to the left field warning track as possible so that the warning track could serve as walkway for guests to get to and from the restrooms. The tent posts left some depressions from the weight of the tent, but the soil was lifted and repaired, then the area was aerated and reseeded. After two weeks, you could barely tell anything had happened.

Photo submitted by Chris Webb, associate director of grounds at Christopher Newport University in Newport News, Va.

John Mascaro is president of Turf-Tec International

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 *SportsField Management* and the Sports Turf Managers Association.

Aerators

BANNERMAN AIR-JECT AERATOR, MODEL BA-4

Aeration encourages roots to grow deeper by increasing the oxygen supply to the root zone for healthy green grass. The Bannerman BA-4 Air-Ject aerator is a commercial-grade self-propelled, walk behind aerator. The Air-Ject can now be fitted with a total of four different types of tines: core, slitter, fracture and spiker. The compact size allows for easy and safe operation in confined areas, and less operator fatigue. The new tine reel assemblies allow for smoother operation, and more holes per square yard. The front tine reel system allows for maneuverability and speed. Simply tilt back and turn; no more lifting and lowering. Ballast weight bars maintain maximum penetration in the ground.

FIRST PRODUCTS UNIVERSAL AERA-VATOR

The First Products Universal Aera-vator uses "patented" solid vibrating tines to fracture and loosen up the soil without tearing the established turf. That means no cores to clean up. This action helps improve the infiltration of water, air and nutrients. First Products' swing hitch allows the user to turn while using. This unit can be used on any type of turfgrass. With six different optional shafts and seed box to increase its versatility, the Universal Aera-vator is must have piece of equipment.

JOHN DEERE AEROCORE

The John Deere Aerocore 1500 and 2000 aerators — offering a 57.5-inch and 77.5-inch coring swath, respectively — allow operators to efficiently aerate without sacrificing time or quality. The Flexi-Link coring system on the 1500 and 2000 models ensures the tines stay perpendicular longer, resulting in a higher-quality hole. The belt-driven design on the Aerocore models is quieter and doesn't require lubrication, making it easier to maintain. The 1500 and 2000 models are both tractor-mounted systems, allowing the operator to work efficiently, pulling as many as 30 cores per square foot depending on the ground speed of the tractor. The six-inch-diameter roller offers better ground clearance and reduces the potential for turf scuffing.

RYAN LAWNAIRE ZTS STAND-ON AERATOR

The Ryan Lawnaire ZTS maneuvers easily thanks to its low center of gravity, zero-turn drive, and top speed of seven miles per hour. Its efficient operation and quick speed make it ideal to tackle large sports fields. The Lawnaire ZTS achieves high-quality aeration with an automatic chain tensioning system. The user is always in control with a precise aeration depth stop and a fast hydraulic tine lift. Aerating can be tough, so comfort is key, especially during large tasks. With a sturdy, shock-absorbing operator platform and zero-turn maneuverability, the Lawnaire ZTS does the work without taking a toll on your body. The intuitive controls of the ZTS also make it ideal for seasonal or new staff, requiring less time and effort to operate.

TORO PROCORE 648

The Toro ProCore 648 aerator has an operating weight of 1,590 pounds, features an aeration depth of up to four inches, and boasts a 48-inch aeration swath. The unit is equipped with a 23-hp. Kohler gasoline engine and can reach speeds of up to 3.5 mph. The ProCore 648 has a TrueCore ground-following system that maintains consistent coring depth. The design of the ProCore 648 puts the wheels in front of the aeration head so that users can make pass after pass without running over cores or freshly aerated turf. Consistently round holes are achieved by the elastomer RotaLink geometry that ensures tines remain vertical as they enter and exit the ground. The individually floating turf holders prevent turf lift when the tines exit the ground to maintain a true and level surface.

TURFCO TURNAER XT8 RIDING AERATOR

The Turfco TurnAer XT8 riding aerator gets its zip from a 22-hp. engine equipped with a cyclonic air cleaner. With an operating speed of up to 7-plus mph and a 30-inch aerating width, the XT8 can aerate more than two acres per hour. It's slim enough to slip through a 48-inch gate opening. The high-profile ground clearance setup enables the XT8 to hop most standard road curbs, and the patent-pending Auto-Depth Control allows operators to pre-set a consistent tine depth across any type of property and terrain. The XT8 features drive chains positioned outside the aeration area, so they won't get clotted with dirt and lawn debris. Use the optional XT8 drop seeder attachment to simultaneously aerate and seed.

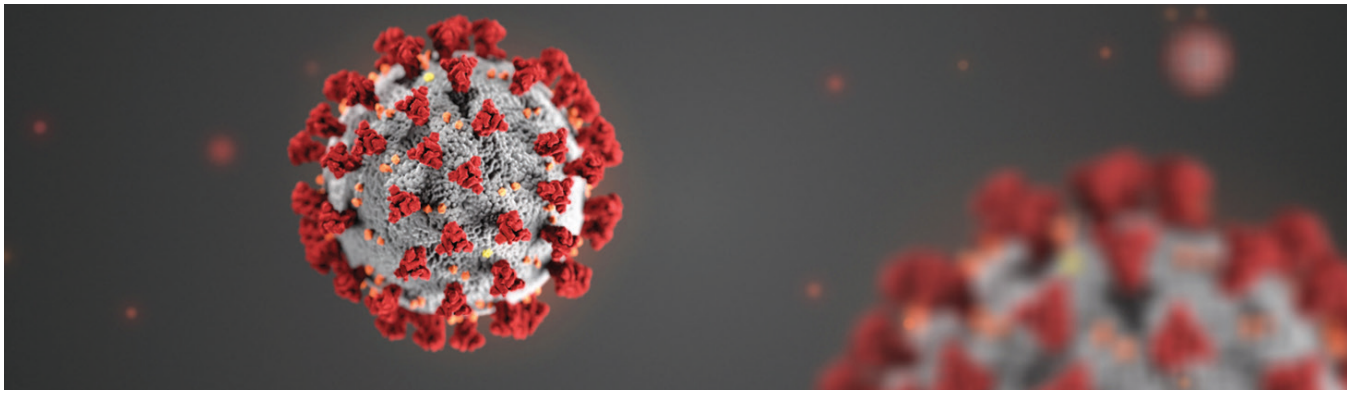
WIEDENMANN TERRASPIKE DEEP TINE AERIFIERS

Wiedenmann has worked for decades to develop the technology to offer the fastest deep tine machines on the market with the TerraSpike XF (extra fast), TerraSpike XD (extra deep), and the TerraSpike GXi HD (heavy duty). The TwinDrive ribbed V-belt drive system allows for speeds up to 485 rpm with the use of any size tine in the Wiedenmann range. In addition, because of the continuous crankshaft, timing issues are never experienced. The TerraSpikes offer a variety of features such as Quickset adjustment of the entry angle and depth, VibraStop and PowerPack anti-vibration and absorption systems, Quickfit tine mounting and extraction system, and Advanced Tine Control system (GXi HD).

Z AERATE STAND-ON AERATOR FROM Z TURF EQUIPMENT

Z Turf Equipment — the new parent brand of Z-Spray lawn care equipment — introduced the 2020 Z-Aerate stand-on zero-turn aerator. Capable of aerating more than 100,000 square feet each hour, the Z-Aerate features a 40-inch floating tine head with down pressure, allowing operators to maneuver around obstacles during aeration. The thumb-controlled hydraulic lift system enables quick turnarounds. Patented locking front caster wheels increase hillside stability, and dual-pump hydraulic wheel motors deliver 8 mph maximum ground speed. The Z-Aerate accepts accessories (available separately), including a 30-gallon spray system, 46-inch dethatch rake, or 36-inch slicer seeder.

CDC Offers Guidance Regarding COVID-19



Editor's Note: *As a monthly publication, it is difficult in mid-March (at our print deadline) to anticipate what will be the state of our nation when you receive this publication in early April. With this situation evolving so rapidly, it is hard to know what information will still be relevant upon publication. However, with the impact the currenct situation is having on our daily lives — including sporting events nationwide — we would be remiss if we did not at least share the following information and guidance from The Centers for Disease Control and Prevention (CDC).*

As of March 15, CDC, in accordance with its guidance for large events and mass gatherings, recommended that for the next 8 weeks, organizers (whether groups or individuals) cancel or postpone in-person events that consist of 50 people or more throughout the United States.

Large events and mass gatherings can contribute to the spread of COVID-19 in the United States via travelers who attend these events and introduce the virus to new communities.

Events of any size should only be continued if they can be carried out with adherence to guidelines for protecting vulnerable populations, hand hygiene, and social distancing. When feasible, organizers could modify events to be virtual.

This recommendation does not apply to the day-to-day operation of organizations such as schools, institutes of higher learning, or businesses. This recommendation is made in an attempt to reduce introduction of the virus into new communities and to slow the spread of infection in communities already affected by the virus. This recommendation is not intended to supersede the advice of local public health officials.

This interim guidance is intended for organizers and staff responsible for planning mass gatherings or large community events in the United States. A mass gathering is a planned or spontaneous event with a large number of people in attendance that could strain the planning and response resources of the community hosting the event. Guidance specific to schools and childcare settings, institutions of higher education, and community- and faith-based organizations can be found on CDC's website focused on prevention COVID-19 spread in communities.

COVID-19 is an emerging respiratory disease and there is more to learn about its transmission, clinical course, and populations at increased risk of disease and complications. Everyone can do his or her part to help plan, prepare, and respond to this emerging public health threat.

As the COVID-19 outbreak evolves, CDC strongly encourages event organizers and staff to prepare for the possibility of outbreaks in their communities. Creating an emergency plan for mass gatherings and large community events can help protect you and the health of your event participants and the local community.

CDC has developed recommended actions for preventing the spread of COVID-19 at mass gatherings and large community events. This guidance suggests strategies to help you plan for and implement ways in which to better protect all involved in a mass gathering.

Organizers should continually assess, based on current conditions, whether to postpone, cancel, or significantly reduce the number of attendees (if possible) for mass gatherings. Listed below are some considerations organizers should keep in mind as they make deci-

sions about whether to postpone or cancel an event.

At a minimal-to-moderate level of community transmission, it is recommended to:

- Cancel communitywide mass gatherings or move to smaller groupings.
- Cancel gatherings of more than 10 people for organizations that serve higher-risk populations.
- At a substantial level of community transmission, it is recommended to cancel mass gatherings of any size.

Everyday preventive actions to help prevent the spread of COID-19 include:

- Stay home when you are sick, except to get medical care.
- Cover your coughs and sneezes with a tissue, then throw the tissue in the trash.
- Wash your hands often with soap and water for at least 20 seconds, especially after going to the bathroom; before eating; and after blowing your nose, coughing, or sneezing. If soap and water are not available, use hand sanitizer that contains at least 60% alcohol.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Routinely clean and disinfect surfaces and objects that are frequently touched. Clean with the cleaners typically used. Use all cleaning products according to the directions on the label. For disinfection, most common EPA-registered household disinfectants should be effective. Follow the manufacturer's instructions for all cleaning and disinfection products (e.g., concentration, application method and contact time, etc.). Additionally, diluted household bleach solutions can be used if appropriate for the surface. Follow manufacturer's instructions for application and proper ventilation. Check to ensure the product is not past its expiration date. Never mix household bleach with ammonia or any other cleanser. Unexpired household bleach will be effective against coronaviruses when properly diluted. Prepare a bleach solution by mixing 5 tablespoons (1/3rd cup) bleach per gallon of water or 4 teaspoons bleach per quart of water

Additional information on cleaning and disinfection of community facilities can be found on CDC's website.

Note: Disposable facemasks should be kept on-site and used only if someone becomes sick. Those who become sick should be immediately isolated from staff and participants who are not sick and given a clean disposable facemask to wear.

Plan for staff absences. Develop and implement flexible attendance and sick-leave policies. Staff need to stay home when they are sick, or they may need to stay home to care for a sick household member or care for their children in the event of school dismissals. Allow staff to work from home when possible. Identify critical job functions and positions and plan for alternative coverage by cross-training staff. Provide instructions about how and when to safely return to work.

Implement flexible staff attendance and sick-leave policies (if possible). Require staff to stay home if they are sick or caring for a sick household member. Notify staff when you plan to implement COVID-19 leave policies. *Note: Direct staff who get sick with COVID-19 symptoms to avoid contact with others and to seek medical advice.*

Currently, older adults and persons with severe underlying health conditions are considered to be at increased risk for severe illness and complications from COVID-19. Event organizers can consider reassigning duties for higher-risk staff to have minimal contact with other persons.

If possible, identify a space that can be used to isolate staff who become ill. *Note: Providing a sick staff member or event participant with a disposable facemask to wear does not replace the need for that person to leave as soon as possible,*

Identify critical job functions and positions and plan for alternative coverage by cross-training staff. Provide instructions about how and when to safely return to work.

stay home, and seek medical advice. Wearing a disposable facemask in the workplace is not a sufficient infection control measure.

Plan ways to limit in-person contact for staff. Several ways to do this include offering staff the option to telework if they can perform their job duties off-site, using e-mail, and conducting meetings by phone or video conferencing. Reduce the number of staff needed such as staggering shifts for staff who support essential functions and services.

Identify actions to take if you need to postpone or cancel events. Work closely with local public health officials to assess local capacities in the area. During a COVID-19 outbreak, resource limitations among local healthcare systems and/or law enforcement can influence the decision to postpone or cancel your events.

COMMUNICATE ABOUT COVID-19

Stay informed about the local COVID-19 situation. Get up-to-date information about local COVID-19 activity from public health officials. Be aware of temporary school dismissals in your area because these may affect event staff.

Update and distribute timely and accurate emergency communication information. Identify everyone in your chain of communication (for example, event staff, participants, suppliers, vendors, and key community partners and stakeholders) and establish systems for sharing information with them. Maintain up-to-date contact information for everyone in the chain of communication. Identify platforms, such as a hotline, automated text messaging, and a website to help disseminate information. Update key community partners and stakeholders regularly. Share information about how you and the emergency operations coordinator or planning team for the venues are responding to the outbreak.

Identify and address potential language, cultural, and disability barriers associated with communicating COVID-19 information to event staff and participants. Information you share should be easily understood by everyone attending the events.

FOLLOW-UP AFTER A COVID-19 OUTBREAK HAS ENDED

- Remember, a COVID-19 outbreak could last for a long time. When public health officials determine that the outbreak has ended in your local community, work with them to identify criteria for scaling back COVID-19 prevention actions at your events. Base the criteria on slowing of the outbreak in your local area. If your events were cancelled, work with your venues to reschedule your events.
- Evaluate the effectiveness of your emergency operations and communication plans
- Meet with the emergency operations coordinator or planning team for your venues to discuss and note lessons learned. Identify any gaps in the plans and any needs you may have for additional resources.
- Maintain and expand your planning team. Look for ways to expand community partnerships. Identify agencies or partners needed to help you prepare for infectious disease outbreaks in the future and try to add them to your planning team.
- Participate in communitywide emergency preparedness activities. **SFM**

All information provided by the CDC. Visit cdc.gov/COVID19 for the latest information and resources about COVID-19.

LASTEC WZ400 FLEX DECK COMMERCIAL ZERO-TURN MOWER

Lastec introduced the WZ400 flex deck commercial zero-turn mower. Built in the USA and starting at $11,900, the WZ400 offers several gas and diesel engine options.

Featuring a 61- or 73-inch cutting width, three 21- or 25-inch flex decks, and zero-turn maneuverability, the Lastec WZ400 commercial zero-turn mower cuts with the accuracy of three small push mowers at the speed and production of a commercial-grade zero-turn mower. The WZ400 includes three independently flexing decks with up to 12 degrees of total up/down motion for superior cut quality.

With zero-turn maneuverability and up to 10 mph speed, the WZ400 is built for speed, production and accuracy in areas around buildings, landscaping, or other common areas that would normally require hand trimming. In addition, Lastec's patented belt-driven decks require minimal maintenance and provide unmatched fuel efficiency compared to hydraulically driven rotary.

The WZ400 flex deck commercial zero-turn mower is now available to order.

RAIN BIRD ESP-LXIVM SERIES CONTROLLERS

Rain Bird introduced the ESP-LXIVM Series, two new, easy-to-use controllers for two-wire irrigation systems that provide large, challenging sites with advanced water-management tools, diagnostics and a host of new-to-the-industry features.

The ESP-LXIVM standard model can support up to 60 stations, while the "Pro" model can manage larger sites with up to 240 stations. Both feature Rain Bird's new Integrated Valve Module (IVM), a "smart valve" that maintains constant communication with the controller for more efficient irrigation and advanced diagnostics. The IVM also eliminates the need for a decoder, cutting the quantity of wire splices in half. This saves time and money not just during installation, but also when the system needs maintenance or repairs.

The LXIVM's advanced diagnostics include a "self-healing" feature that automatically detects fixes to wire path and splice issues and restarts irrigation without manual intervention. A "two-wire mapping" feature maps integrated devices to corresponding wire paths to quickly find and resolve issues. Supported field devices include the IVM-SOL for controlling stations or master valves, the IVM-OUT to manage third-party valves or devices, the IVM-SEN for controlling weather or flow sensors, and the IVM-SD for surge protection on the two-wire path.

The LXIVM's advanced flow management tools include FloWatch, which alerts to high- and low-flow conditions, and FloManager, which manages hydraulic demand, making it possible to simultaneously activate multiple stations and reduce the time it takes to complete full irrigation cycles. Optional weather sensors are programmable by station to prevent or pause watering. Additional water management features include Cycle + Soak, Seasonal Adjust (by program or month), Station Delay and Rain Delay, among others.

BRANDT SHOWCASES NEW SUSTAINABLE FOLIAR NUTRIENTS, GRIGG TECHNOLOGY

Brandt rolled out two new proprietary nutrient technologies: Brandt Organiplex and Grigg Turftopia.

Brandt Organiplex has been approved by the Organic Materials Institute, and is recommended for customers looking for high-quality, high-performance sustainable fertilizers. The formulation contains a high concentration of amino acids, which boosts nutrient efficiency. Brandt Organiplex is the latest addition to the company's sustainable product portfolio, which includes nutrients, adjuvants and bio-pesticides.

Grigg Turftopia is the newest formulation in the premier Grigg Proven Foliar nutrient line. The new technology helps maintain turf hydration, resilience and playability during periods of drought and environmental stress. It contains unique properties that help maintain cellular hydration and strength.

"We're looking forward to bringing this technology to the turf industry," said John Guglielmi, national sales director at Brandt. "We are very excited about the value it's going to bring to superintendents."

TORO INTRODUCES NEW GROUNDSMASTER OUT-FRONT ROTARY MOWERS

Toro is launching its next generation of out-front rotary mowers for the Groundsmaster product line. The new Groundsmaster 3200/3300 mowers are designed to be durable and tackle tough jobs all year round, increasing productivity and offering an enhanced operator experience.

The Groundsmaster 3200/3300 mowers are built to last and feature 24.7- and 37.4-hp. Tier 4 / Stage 5 Yanmar diesel engines. Combined with an advanced pump and motor drivetrain, the overall performance and durability of the machine is maximized. In addition, Toro's cutting decks feature a strong 7-gauge steel deck shell with side bumpers, rugged cast iron spindles with dual-tapered roller bearings, thick .25-inch heat-treated blades, and a front bullnose bumper to provide maximum protection. The cutting decks also easily tip up into a service position for quick routine maintenance.

The Groundsmaster 3200/3300 mowers offer improved productivity features for getting the job done quickly, including 60- and 72-inch side-discharge, rear-discharge and flail cutting decks — along with fast ground speeds up to 15 mph for moving between job sites efficiently. Toro's CrossTrax all-wheel-drive system provides automatic traction control, shifting power to the wheels in slippery conditions to access more challenging terrain. The 12-gallon fuel tank maximizes mowing time and minimizes downtime to refuel. Plus, a 7.8-inch ground clearance makes it easy for the mowers to climb curbs and maneuver over other obstacles.

In terms of operator comfort, adjustable suspension seats, tilt steering, and an optional all-season cab enclosure will help reduce operator fatigue and allow for all-day and multi-season use. Intuitive controls are at the operator's fingertips on the armrest console, making it simple for the operator to react to changing conditions. Additionally, the onboard InfoCenter displays service reminders, alerts and diagnostic information.

For added versatility, the new Groundsmaster 3200/3300 will be compatible with a range of attachments for multi-season use, including a Boss plow, cab enclosures and other snow implements.

T°COOL EVAPORATIVE COOLING

With nearly 20,000 synthetic turf fields in the United States, and with approximately 1,500 new fields built each year, hundreds of thousands of athletes, coaches and officials cope with oppressive, dangerous heat that consistently exceeds 140 degrees, and can reach the 160-degree level.

According to The Centers for Disease Control and Prevention, heat illness is a leading cause of sudden death among high school athletes. Since 1995, 64 football players have died from heat stroke. Of these, 47 were in high school, 13 in college, two professional, and two organized youth. In 90 percent of these cases, the fatal incidents occurred during practice.

T°Cool technology is combating the excessive field temperature issue and making the synthetic turf cooler, safer and more playable. T°Cool, which resists bacterial attack, is an eco-friendly evaporative cooling technology that provides a cooling effect on synthetic turf surfaces by coating the black crumb rubber infill. Today, approximately 80 percent of synthetic turf fields nationwide use black crumb rubber infill, due to the benefits of fiber support, cushioning and consistency for performance. Once treated, the T°Cool solution continuously activates through rain, dew, humidity and/or watering the field, thus reducing the infill temperature/field temperature by an average of 30 to 50 degrees and bringing the overall field temperature closer to that of natural grass.

"Synthetic turf fields get dangerously hot, but there has never been a formidable and safe solution to tackle the oppressive heat. Most people don't realize that watering a field provides only a very brief reprieve and often exasperates the heat issue," said Chris Tetrault, inventor of T°Cool. "With T°Cool, we can now pre-treat the black crumb rubber infill for synthetic turf fields and deliver a proven solution to make these fields cooler, safer, and more playable, and without compromising any of the key benefits."

As an added benefit, T°Cool's evaporative cooling solution for synthetic turf fields also reduces the coefficient of friction, thus diminishing the severity of turf burns, while effectively resisting the growth of harmful bacteria that grow on open wounds.

ALTOZ XP HD

Built for heavy-duty professional mowing, the 2020 XP HD delivers all the horsepower and durability needed to tackle the toughest mowing jobs day after day.

The XP HD offers three engine options — all V-twin cylinder, carbureted versions of the Kawasaki FX — the 852cc with 27 hp. (XP 540 HD), 921cc with 31 hp. (XP 610/660 HD) and the 35 hp., 999cc in the XP 720 HD. Pros looking for increased fuel efficiency can turn to the XP 610 HDi with Kohler's Command Pro engine boasting 824cc, 33 hp. and electronic fuel injection.

XP engine performance is matched to highly efficient commercial Hydro-Gear hydrostatic transmissions. The ZT-4400 can drive all XP models to a max forward speed of 11 mph, and has responsive operator control.

Easy on/off accessibility to the operator's platform are provided by an incorporated deck step with foot traction plate. Available in four cutting widths — 54-inch (540 HD), 61-inch (610 HD/HDi), 66-inch (660 HD) and 72-in (720 HD). Rotational deck height adjustment changes cutting height in 1/4-inch increments ranging from 1.5- to 5-inches with the easy turn of a dial. The adjustability of anti-scalp wheels and baffles, in combination with a multitude of blade options, allow users to tune the Aero Deck for all seasons, varying conditions and grass types.

The Altoz XP chassis provides an ultra-rigid platform centered around the Altoz C-channel frame, laser cut and welded from heavy gauge steel. Up front, the intelligently designed low-profile front viewport provides the best sightlines for operators. The angled steel front wheel forks with heavy-duty tapered caster bearings glide over the toughest terrain.

Operator comfort starts with the 12-way adjustability of the high back suspension seat with incorporated armrests and the high-grade elastomers that protect the foot wells from ground vibrations. The all-new SmarTrac Pro control represents a leap forward in technology: a solid-state PTO switch, keyless push-to-start ignition switch and the patented So Start clutch control decreases mechanical wear and significantly increases deck belt life.

The following are some industry Tweets from the past month:

@INDYINDIANSTURF

Soil work yesterday, today, and the days upcoming!

MARCH 12

@CREEDY95

Great couple days of field resod. Thanks for the bulletproof sod *@GreenValleyTurf @fowler2325 #kentuckybluegrass #turfgrass #fieldrenovation #greensideup #1inchsod #plasticgrown #rockies #denver #colorado #mlb #onemoredaytogo*

MARCH 10

@VT_groundscrew

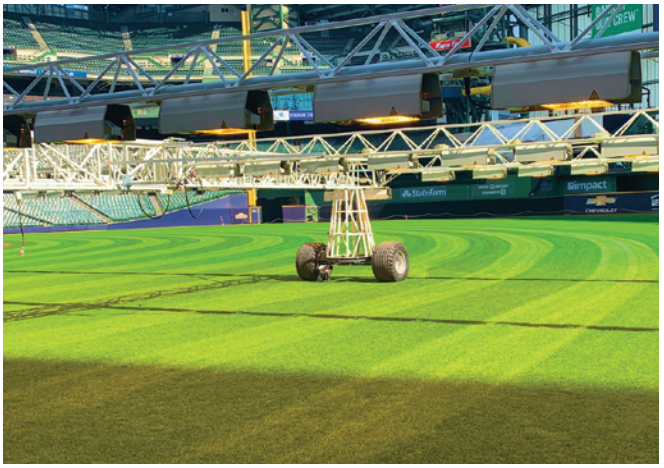
Disinfecting the Beamer-Lawson Indoor Practice Facility

MARCH 12

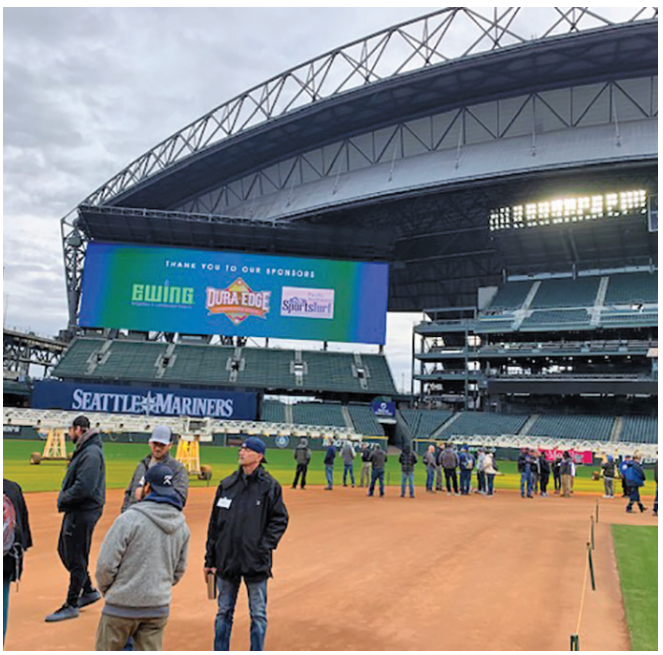
@TurfSpartanLord

Blankets are off and the mowers are rolling. *#NewField* has filled in nicely this winter. Now the push to *#OpeningDay @reds #RootedInRedsCountry*

MARCH 9



@ryan_woodley
Great day at the park today. 2 days with the roof open has been awesome for the field!
MARCH 8



@luke_yoder
Thank you *@BCsodfather* for rolling out the red carpet *@TMobilePark*. Always fun to partner up with *@TimTlambert* to discuss *@DuraEdge* engineered soils with over 100 in attendance yesterday. We appreciate the support from *@pnwstma* on this.
MARCH 6

@FieldExperts
Our industry can provide some of the most rewarding careers and we see the outstanding work of STMA members on some of the biggest stages in sports.

Here are 9 reasons to choose a college major in turfgrass. *https://www.morningagclips.com/9-reasons-to-choose-a-college-major-in-turfgrass/*
MARCH 5

@Zona_TURFlete
Football is *#Shining* today. Loving the weather. Crew has been in full grind mode. Nice to look at the product they put out, it has me appreciate what I do. *@ArizonaFBall @Francisdevildog @azstma*
MARCH 4

Battery and Robotics

FIRST ANSI/OPEI ROBOTIC MOWER STANDARD PUBLISHED

Manufacturers and start-ups will now be able to design robotic, battery-powered and electrical lawn mowers to the industry standard with the publication of the first-ever standard for this equipment by the American National Standards Institute (ANSI) and Outdoor Power Equipment Institute (OPEI).

Publication of the robotic lawn mower standard has been highly anticipated by the outdoor power equipment industry. The global market for robotic lawn mowers is predicted to grow by nearly 22 percent by 2025 and the market is estimated to be worth $1,400.62 million by 2025, according to a study last year by Grand View Research.

"Artificial intelligence, connected technologies and other innovations are changing all industries — including the outdoor power equipment industry. Consumers and commercial users are getting more comfortable with the idea of using new tech, such as robotic mowers," said Kris Kiser, president and CEO of OPEI.

The standard will be sold through the ANSI website at *www.webstore.ansi.org*.

"Standards like this, developed through a public input process that brings together consumers, manufacturers, and commercial equipment users, provide manufacturers a benchmark guidance on the best way to build equipment," Kiser told *OPE* magazine (sister publication to *SportsField Management*). "OPEI members build their equipment to that benchmark, and it's easy to identify non-members who don't. The standard provides a level of assurance to OEMs, dealers and end users that the equipment they use is as safe as possible."

HUSQVARNA'S NEW SPRAYERS POWERED BY LITHIUM-ION BATTERY

Husqvarna's new 2-gallon 7.2V lithium-ion battery sprayer is equipped with an air compressor head, eliminating manual pumping and keeping the tank pressurized for a consistent spray application.

The integrated pump handle has a convenient charging port with rubber cap on the side of the pump head for easy access and moisture resistance while in use.

Husqvarna's 2-gallon battery sprayer is also equipped with a 25-inch stainless-steel wand with poly liner, durable 50-inch PVC hose, professional-grade shutoff and a nozzle kit. This sprayer is compatible with most water- and bleach-based chemicals, as well as wettable powders, and can spray up to 24 gallons on a single charge.

The new 4-gallon 18V lithium-ion sprayer contains a battery-powered pump, eliminating the need for manual pumping and saving the user time and energy.

The 18V battery is secured in a durable, protective battery compartment, keeping the battery concealed and away from liquid that may cause damage. This sprayer contains a triple filtration system to help reduce the buildup of large solids and other debris.

The ergonomic tank design, along with the padded harness, ensures maximum user comfort while in use. Husqvarna's 4-gallon battery sprayer is also equipped with an extra-long 25-inch stainless steel wand with poly liner, durable 50-inch PVC hose, professional-grade shutoff and a nozzle kit. This sprayer is compatible with most water- and bleach-based chemicals, as well as wettable powders, and can spray up to 50 gallons on a single charge.

STIHL BATTERY PRODUCTS AND TECHNOLOGY

The new Stihl BGA 200 handheld blower, with a blowing force of 21 Newtons, is now the most powerful dedicated handheld blower in the Stihl range. This AP battery series unit can be operated in a classic handheld position or suspended in the specially developed carrying system, allowing the blower to hang on the side of the body. The BGA 200 is relatively quiet at 59 dB(A) in its highest power level setting (also known as boost mode) and can be operated without restriction in noise-sensitive areas.

Stihl is also introducing its new Stihl connected, an intuitive equipment management platform that tracks usage and maintenance data for outdoor power equipment through a Bluetooth-enabled Stihl smart connector, app and online portal. Stihl fleet owners will now be able to track runtime, operating hours and maintenance schedules right from their phone.

ECHO ROBOTICS TM-2000 AUTONOMOUS MOWER

Echo Robotics' TM-2000 (winner of an STMA "Innovative Award") can handle up to five acres of turfgrass efficiently and quietly while also finely mulching clippings to promote turf health. Since the unit can be remotely commanded while monitoring performance via a web platform and mobile app, sports field managers can put their time and labor toward issues that actually require their direct attention. It can also be scheduled to operate around field usage and watering cycles.

MEAN GREEN MOWERS COMMERCIAL ELECTRIC EVO-74

The Evo is the flagship commercial electric mower of the new Evolution series by Mean Green Mowers. With up to 8 hours of continuous mowing time, a 74-inch deck, speeds up to 13 mph, 20-degree slope capability, and horsepower comparable to a 37-hp. diesel mower, the EVO is sure to please any large area mowing operators. Designed with maximum power in mind, Mean Green has combined time-tested planetary gearing and the latest electric hub motor technology resulting in its Impulse Drive System (IDS), generating unrivaled power and weight-carrying capacity. The patent-pending deck lift system, SmartDeck, can be operated with the push of a button or foot pedal with the interactive touch screen display. With the ease of use and constant awareness of the deck height, the SmartDeck makes jobs effortless with customizable user settings. The interactive touch screen display with pass code is function tested in all environments to ensure long-term reliability and displays full functionality of the machine, including battery consumption, state of charge, and deck lift system.

GREENWORKS COMMERCIAL GT161 STRING TRIMMER

Greenworks Commercial's GT 161 attachment-capable string trimmer allows professionals to have one tool that can take on a plethora of jobs with its universal attachment-capable base. Transforming the tool with commercial-grade attachments — whether it is used as a string trimmer, hedge trimmer, pole saw, edger or even a cultivator — allows professionals to save time and energy in the way they work. Plus, with an aggressive 16-inch cutting path, the GT 161 cuts through even the toughest of brush. Powered by Greenworks' 82V lithium-ion battery, the GT161 delivers gripping power comparable to gas tools without the mess, hassle, or pollution. Ignited by the simple touch of a button and equipped with brushless motor technology, the GT 161 is built for ease of use.

LEFT HAND ROBOTICS LAUNCHES BOLT

Left Hand Robotics, manufacturer of a self-driving smart robot for commercial turf and snow, recently launched BOLT, a technology platform that transforms outdoor machinery and power equipment into smarter, more efficient, ready-to-work robots.

BOLT brings autonomous navigation, connected sensors, and real-time robot operations to outdoor power equipment and machines doing repetitive jobs around the globe. Building on Left Hand Robotics' field-proven experience with its own robot tractors, BOLT allows OEMs to launch faster, reduce R&D costs, and tap into a unified platform with navigation, sensors, controls, software and apps.

"Our team has learned a lot, building, testing, proving how autonomous tractors can work on tedious, dirty jobs in the real world. These are tough problems to solve and we have already invested more than 80 engineering years into the technology behind BOLT," said Terry Olkin, CEO for Left Hand Robotics. "We'll continue to build our own robots while offering BOLT to a limited number of OEMs in the first year."

BOLT focuses on several key areas to help with machine automation, including:

- Autonomous navigation and telemetry
- Smart sensors and cameras
- Connected power equipment and controls
- Cloud-based robot operations center and apps
- Job planning, reporting and analysis

Since each OEM is likely to have different requirements or product needs, BOLT partners will go through multiple deployment phases, including evaluation, development and deployment. Left Hand Robotics is already collaborating with top power equipment and machine manufacturers to incorporate BOLT features into their future product lines. **SFM**

The Mainstay of STMA: Committees

Associations can attribute much of their success to their members' volunteer spirit. That is definitely true for STMA.

Volunteers play a key role in STMA's successes. The STMA mission guides the overarching reason the association exists; the board develops the strategic plan that sets the direction for three to five years; then committees are tasked with advancing specific goals. Committees do the heavy lifting of designing and creating products and services that are important to members, as well as improve current services. Without the committee system and the hundreds of hours volunteers devote to STMA, STMA's offerings would neither be as relevant to members nor as robust, and the strength of the association would falter.

STMA's committee service begins in March and ends in January. The president aligns the committees with the goals that must be accomplished during the year, and there is a call for volunteers for those committees. The president then appoints members to those committees. That process has closed for 2020, and committees are set and have begun their very important work for STMA.

2020 committees (as of 3/12/2020)

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Chair: Jeremy Driscoll

Members: Brad D'Agnillo; Cliff Driver, CSFM; Alan Dungey, CSFM; Rick Perruzzi, CSFM; and Sheree Scarbrough

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STMA Affiliated Chapters Contact Information

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

Colorado Sports Turf Managers Association: www.cstma.org

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

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

Florida #3 Chapter (Central): 407-518-2347, Dale Croft, dale.croft@ocps.net

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

Georgia Sports Turf Managers Association: www.gstma.org

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

Illinois Chapter STMA: www.ILSTMA.org

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

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

Iowa Sports Turf Managers Association: www.iowaturfgrass.org

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

Mid-Atlantic STMA: www.mastma.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

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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JOHN DEERE

Q: As part of my IPM program, how do I best determine a threshold for acceptable weed cover on an athletic field?

— John Brant, supervisor of sports and recreation grounds, Ohio University

A: This question is common, and not easy to answer with one blanket statement. On certain fields, the threshold may be zero tolerance. This is because safety and playability come first. On other fields, the goal may not be to eliminate all weeds, but to keep the number low enough as to prevent unacceptable visual appearance or an uneven playing surface that increases risk to athletes. There may even be some areas, such as general lawns and heavily used recreation fields, where all weeds are tolerated.

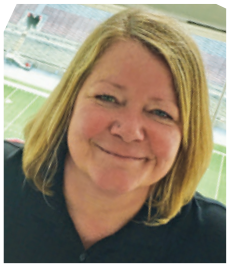
The answer is further complicated because it depends on what species of weeds you deal with. Spurge and knotweed, for example, may produce green cover in the summer; but since they are annuals, those areas will be bare soil from October until spring. This may be acceptable if the field is used for summer sports but not for fall sports. Another consideration is how much damage the weed infestation does to the turfgrass. Sedges are unsightly during the summer, but, unless it is a very severe infestation, this species tends to not thin the turfgrass and reduce playability in the fall. On the other hand, species such as crabgrass and goosegrass will result in stand loss.

The most recommended course of action is to monitor your weed populations and collect data.

Since it's not an exact science, the most recommended course of action is to monitor your weed populations and collect data. Collecting data can be a challenge, so maybe have two approaches — weeds that spread (clover, weed grasses) could be assessed as a percentage of the grass cover, while tap-root weeds (dandelion, plantains etc.) are physically counted. Collecting data helps everyone understand the issue better, and can be used to set future goals. In essence, data is power! Collecting data can done in a couple of ways; (1) Subjective assessment. For example, a turf manager determines percentage weed cover. Subjective data can sometimes be viewed as skewed, since it's based on personal opinion. Or, (2), objective assessment, where the turf manager counts with a point quadrant, or generates numbers from digital imaging, etc. Objective assessment results in measurable and trackable data, no matter the assessor. In addition to weed numbers, keep data on types of weeds and information on how they affect the fields (do they diminish aesthetics, affect ball roll or bounce, compromise athlete safety and/or performance?).

One final thought from weed scientist, Dr. Dave Gardner: Many intramural and school athletic mixes now contain micro-clovers. Controlling unwanted weeds in a turf:clover stand will need careful consideration. Unfortunately, there are no herbicides that control the undesirables and leave the clover alone. A novel approach may be to control those undesirables when the clover is dormant, which may be either in the heat of summer, or from November to April. **SFM**

Resources: STMA's Playing Conditions Index (PCI) assessment form can be found in the Members section of *stma.org*. Ohio State's Field Evaluation Document can be found online, or you could make your own.



Pamela Sherratt
Sports turf extension specialist
The Ohio State University

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

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