

# SportsField

## MANAGEMENT

December 2020

Vol. 36 No. 12

The Official Publication of the Sports Turf Managers Association

Integrating Assessments 18 | Turfgrass trends 22  
Field Design/Build 28 | Infields 30

## In-house Innovation

Motivated staff and a strong maintenance plan earn  
Captains Field at Christopher Newport University  
College Soccer FOY

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- TOPDRESSERS
- MATERIAL HANDLERS
- SOIL RENOVATORS

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# Editor's Note



**John Kmitta**  
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It has now been one year since I took over lead editorial duties on *SportsField Management*. And although most years fly by, I think we can all agree that we are ready to move on from 2020.

This strange, unprecedented year is something none of us could have fathomed when the year began. I had high hopes of traveling to meet many of you, see your fields and facilities, conduct interviews, take photos and just get to know you and the industry better.

However, during this season of giving thanks, I can't stress enough how thankful I am for the support of STMA, its members, and others throughout the industry. That support is evident in the regular editorial contributions and guidance that industry experts have provided throughout this challenging year.

In this issue alone, we have some amazing contributions on topics such as integrating assessments into a municipal/school grounds management program (page 18), turfgrass trends (page 22), field construction (page 28), baseball/softball infields (page 30), industry research

(page 34), and more. In addition, we are thrilled to share an article about industry legend George Toma and how he shares his time and expertise to help veterans and first responders (see page 14).

These types of editorial contributions are the lifeblood of *SportsField Management*, and I am extremely thankful for all those in the industry who continue to share their stories, their insight and their expertise. I especially want to thank John Mascaro, Dr. Grady Miller and Pamela Sherratt for their regular editorial contributions, which add so much credibility to what we do.

With our inability to travel and interact with you in person, the pipeline of information throughout this industry — and the need for communication and editorial contributions — is more important than ever. In our effort to inform and educate, please continue to reach out to me with any news, story ideas, or just to chat.

I wish you all a safe, healthy and happy holiday season, and I look forward to a prosperous 2021. **SFM**

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# President's Message

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The holiday season is now upon us, and, to me, there is no better time to give thanks and recognition to the people who have helped you get to where you are today. With that said, I would like to start by giving thanks to the members of this organization and this industry. During this crazy time, it has been very hard for me to stay motivated at times, but the energy you all have provided during 2020 has truly been a blessing. Through the *Route to Recovery* guide and its subsequent editions, to the support and understanding of moving to a virtual conference model for this year, this organization's members have exhibited the resiliency that makes each of you special.

Out of adversity rises either opportunity or despair. I firmly believe that this association is using the current adversity to find opportunity. A great example of this was in the recent call for nominations to the STMA Board of Directors. I want to thank all of those who considered putting themselves out there, and the 38 individuals who went through with it. That number is a great indication of the strength of our organization and, in my opinion, the belief that we are moving forward to a new tomorrow in the STMA. By the time this is published, the new board elections will be underway. Please take a moment to fill out your ballot and



**Jimmy Simpson, CSFM**

STMA President

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have a hand in the future direction of the association.

Additionally, I would like to say thank you to all those who served on a committee. Your voice matters, and committee work is a great place to get involved. I have written about this before, but I think it bears repeating that an idea that is never shared is a dream that does not come true. The future of this association is dependent on those dreams and ideas, so thank you for your efforts. Finally, thank you to the team at STMA headquarters. Your drive and passion for this association continues to breathe life into the ideas and dreams of our members.

I truly believe the people around us make us all better. As we move to close out the year, I would be remiss if I did not thank those of you who have already renewed your association membership for 2021 and those who will do so. The association is only as good as the membership that makes it up. Please have a safe and happy holiday season, and I look forward to 2021 with this resilient membership. **SFM**

Collaborating in change together,  
Jimmy Simpson, CSFM



## CAPTAINS FIELD CHRISTOPHER NEWPORT UNIVERSITY NEWPORT NEWS, VA.

Since the moment we stepped onto our athletic fields, we have always said that with good agronomics and cultural practices our fields could do more. Due to construction, our lacrosse program had to find a new home for the 2019 season. That home was our soccer facility, Captains Field. Captains Field is a native soil field built around 1997 with no drainage, a poor irrigation system, and one full-time employee to maintain it (along with 13 other acres of athletic fields). Between lacrosse and soccer, Captains Field was used 212 times in the last year, which included hosting a conference tournament, as well as the women's soccer NCAA tournament for first, second, and semi-final round play.

With more field usage than we have ever seen before, our agronomics and cultural practices were put to the test. An aggressive aeration regimen that consisted of solid, coring, deep tine, and linear aeration helped push the field through a wet fall soccer season that was followed by the wear and tear of collegiate lacrosse. With no means to afford thick-cut sod, we made our own

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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.





sod nursery out of our common area grounds. We used this to harvest our own thick-cut sod for in-season repairs and to transition the field from lacrosse right into summer camps with no downtime. With 212 events in the last year, we had to be more aggressive with our fertility. Due to the fact that we are a state university in the Chesapeake Bay Watershed, we have not made a phosphorus application to this field since 2016. We used our soil test results to create our own custom blend of micronutrients that we apply monthly to help simplify our fertilizer applications. We also used the power of plant growth regulators to promote turf density while reducing our mowing needs to stretch our labor further across our facilities during a summer that saw all athletic events take place on natural grass.

Captains Field was not always our best looking field. It took a lot of abuse, but we

stuck to our maintenance plan and were able to give our Captains one of the best soccer surfaces in Division III athletics when they returned to campus in August. We did not have the luxury of a new or recently renovated field. We hope that we can serve as an example that, with a motivated staff and a strong maintenance plan, anyone can take an old variety of turf on a 20-plus-year-old native soil field and push it to its limits to meet the needs of their athletic community.

— Chris Webb, associate director of grounds

FIELD OF THE YEAR  
COLLEGE SOCCER



**Category of submission:** College Soccer

**Field manager:** Chris Webb

**Title:** Associate Director of Grounds

**Education:** B.S. Virginia Tech

**Field of study:** Crop & Soil Environmental Science

**Experience:** While obtaining my B.S. from Virginia Tech, I spent two summers as an intern with the Washington Nationals Baseball Club under Larry DiVito. There I was able to learn about, and gain experience with, the challenges of transitioning back and forth from MLB to MLS while the stadium was shared with DC United. During my second summer, I was able to be part of the inaugural season at Nationals Park. After graduating from Virginia

Tech, I worked in professional grounds management before coming to Christopher Newport University (CNU). In 2016 our department began managing all athletic fields at CNU in addition to campus grounds.

**Full-time staff:** Dean Whitehead, director of grounds, and Matthew Yarborough, athletic field technician

**Part-time staff:** Kent Watkins and Terry Rosser

**Original construction:** 1997

**Turfgrass:** VaMont bermudagrass; we are currently using Tahoma 31 inside the goal areas

**Rootzone:** Sandy loam

**SportsField Management (SFM):** We profiled you last year for your Field of the Year win in the College Softball category. How does this win, in the College Soccer category, compare to that? What does it say about you and your crew to produce winning fields in two different categories in back-to-back years? Or what does this win mean to you?

**WEBB:** Just like our 2018 Softball FOY win, this award was huge to our entire department. We have a great team in our department that put it all out there every single day. The hard part about our job is that if we do it well, no one ever thinks about the grounds staff when they watch a game. They see the soccer or lacrosse match, and not the sod laid on a 95-degree day, picking up aeration cores at 5 p.m. on a Thursday, or hand filling divots after every game. To me, this win is about recognizing the hard work our team put into that field.

**SFM:** Please remind us, and our readers, about your background and your journey as a sports field manager.

**WEBB:** While I was studying Crop & Soil Environmental Sciences at Virginia Tech, I had the opportunity to work with Larry DiVito at the Washington Nationals for two summers at RFK Stadium and Nationals Park. My love for sports turf came into existence there, but I wound up in professional grounds management before our Grounds Department at Christopher Newport University took over the maintenance of our athletic fields in 2016.

**SFM:** What does your typical day look like (if there is such a thing as a typical day), and what is your overall approach to your job?

**WEBB:** A unique challenge within our department at CNU is that we manage the athletic fields, as well as campus grounds. After we get the crews out the door in the morning, I typically will make a round through our athletic facilities. I am looking for disease, irrigation issues or whatever

surprise working on a college campus may bring. In season, I am watching how the fields are responding to play to tweak our maintenance approach to keep field conditions as optimal as possible, and will redirect the crew as needed. The rest of my day is spent bouncing between campus grounds and athletics grounds. I would describe my approach as taking care of the basics first. If we do nothing else, we will make sure our fields are cut, safe and clean. Once we know we have taken care of that, we can move onto other maintenance practices.

**SFM:** Who would you say are your mentors, what have you learned from them, and how do you apply that in your approach to your job?



**WEBB:** My grandfather was probably the biggest mentor in my life. He taught me my work ethic and my sense of humor. If he were still alive, he would laugh at my response to this and promptly tell you about all of the mohawks that I left in his yard when I would use his old Snap-on lawn mower. I owe my passion for this industry to Larry DiVito and the 2007/2008 Nationals grounds crew. I knew absolutely nothing about field maintenance when Larry took me on in the

summer of 2007 as an intern. Over those two summers I think they really taught me an eye for detail, and I really learned a lot about skin maintenance from watching Larry and the passion he had for his work. At work, I believe meeting high standards comes from a balance of working hard and having a little fun along the journey.

**SFM:** What challenges did you (do you) face specific to Captains Field, and how did you approach those challenges? Also, what advice do you have for other field managers when it comes to facing similar challenges with their soccer fields?

**WEBB:** Captains Field is more than 20 years old and still has the original VaMont bermudagrass surface. The

## FIELD OF THE YEAR COLLEGE SOCCER

irrigation is original to the field with poor coverage. There is no drainage. At some point in time they added onto the bleachers on the field, which made the lack of drainage even worse on that side. It is a native soil field that saw more than 200 events last year, so limiting compaction is one issue we are always addressing. We combine regular deep- and shallow-tine aeration to promote growth, mitigate compaction and promote drainage. We've topdressed with compost to help build soil structure. We utilize wetting agents to help promote better water distribution throughout our profile, and installed irrigation in the offseason on our perimeter to help with areas that our irrigation wasn't reaching. We've replaced the 6-yard boxes with Tahoma 31 so that we have a superior bermuda variety in our highest wear area. We regularly mark the field after rain events to key in on low spots and fill them in to smooth the surface out. We fill divots and roll the field after every game. Like lots of others, we do not have a perfect field to work with. We don't have a huge budget or large staff. My advice is do not let that

keep you from being an advocate for your field. Get to know your coaches, their preferences, and their habits. Ask them to move drills around. Your passion for your field can be infectious. Captains Field is a prime example. Our men's soccer team now takes one afternoon a week after practice and the entire team fills divots on the fields. It is amazing how much more they care about their field when they see how much we care.

**SFM:** You now have FOY wins in back-to-back years. What's next?

**WEBB:** Well, one of the key players in our success — our field technician, Matt Yarborough — tells me that I do not stop often enough to smell the roses, and he is absolutely right. Like many sports field managers, I wear a lot of hats, and often put taking care of myself behind my family and my career. The pandemic reminded me that the fields will be okay when we are away, so I am going to try to stop and smell the roses a little more for the time being. **SFM**





### Judge's Comments

Captains Field at Christopher Newport University is deserving of this Field of the Year Award. They have provided a high-quality product using a mix of full-time and part-time staff. Their use of sound and proven cultural practices has given them the capability to step up and add additional use to its field, all while navigating local area restrictions in fertilizer applications. Chris and his staff have demonstrated the capability to promote in-house innovation for the betterment of his fields and student athletes.

— Anthony Smerk, facilities manager at Beaver Creek Soccer Association

*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.*

# The Art of Perfectionism...and Then Some

**George Toma shares his expertise and his work ethic to help veterans and first responders**

By David Smale

When George Toma signs an autograph — something he's done countless times in his 79-year career as a groundskeeper — he finishes with “and then some.”

That message speaks to a work ethic developed as the son of a Pennsylvania coal miner in the 1930s and 40s. You do whatever is necessary, and then, when you're sure you've done everything, you do a little more.

It's a motto that has carried him through a multi-Hall-of-Fame career and earned him nicknames like “the Nitty Gritty Dirt Man,” “the Sodfather” and “the Man of Sod.”

His father died when Toma was 10 years old, as a result of Black Lung Disease from working in the coal mines. Kids as young as 8 years old in Edwardsville, Pa., were expected to work in the mines, but Toma wanted nothing to do with the trade.

After his father's death, he got a job on a nearby vegetable farm, earning 10 cents an hour, working 10 hours per day, six days per week. The next year he worked at a chicken farm, where he said he learned a lot about work ethic.

When he was 12, he went to work for a neighbor, who was the head groundskeeper for a Class-A minor league baseball team in Wilkes-Barre and his career started. He became the head groundskeeper at age 16 while he was still in high school.



**George Toma (pictured here in the red hat), official groundskeeper of “The Wiffle at the Hollow,” a two-day Wiffle Ball event to raise funds for The Battle Within, gets hands on with field preparation.**

Other than a two-year Army stint in Korea in the early 1950s, Toma has spent his entire career improving fields.

He came to Kansas City in 1957 to resuscitate a Major League Baseball field with more gravel than grass, and that “grass” was really crabgrass and clover. Before heading to Kansas City to check out the conditions, he called his mentor, Emil Bossard, who said, “George, don't go to Kansas City. I've been going there once or twice a month trying to straighten that place out.”

Toma still took the job, “because if I screwed it up, nobody would notice,” he said.

He said he almost got fired when he killed all the crabgrass, leaving a brown field at the start of the 1958 baseball season, but by July 4 it was “an oasis in the desert,” he said. “Everybody loved the field. Players said they couldn't believe how beautiful Kansas City's field was.”

Kansas City is still his home more than 60 years later, though he still carries the hardscrabble eastern Pennsylvania accent. Through the years, he worked on the field at Municipal Stadium, home of MLB's A's and later the Royals, as well as the Chiefs beginning in 1963. In 1972 he

moved with the teams to the Truman Sports Complex, where he worked until 1999.

Following the announcement of the merger of the AFL and the NFL, NFL commissioner Pete Rozelle came to Kansas City and famously told Chiefs owner Lamar Hunt, “Your groundskeeper is amazing.”

That certainly played a role in Toma being named the official groundskeeper of the first Super Bowl — and every single Super Bowl since. He was the head groundskeeper at Super Bowl LIV, which was played on his 91st birthday this past February.

Which brings us to today. His longtime friend from the Chiefs, Mitch Wheeler, who serves as the director of development for The Battle Within, called and asked if Toma would be willing to lend his name to a charitable event called “The Wiffle at the Hollow.” It is a two-day Wiffle Ball event to raise funds for The Battle Within, a program to help veterans and first responders heal from the traumas they have endured in their service to others. Each warrior faces his or her own battle. These are ordinary people who have been thrust into extraordinary situations for the betterment of others. These traumatic injuries are carried in the mind, body and soul, often in secret.

The Battle Within has built a community for warriors nationwide to attend a free, five-day program built by warriors using holistic techniques steeped in ancient warrior culture and backed by modern evidence-based methods.

The Wiffle at the Hollow started small, but has grown dramatically in each of its first four years. Joe Un-



*The “Wiffle at the Hollow” Wiffle Ball event raises funds for The Battle Within, a program to help veterans and first responders heal from the traumas they have endured in their service to others.*



*The “Wiffle at the Hollow” Wiffle Ball field is officially known as George P. Toma Field.*

gashick owns the field, part of his large front yard just south of the Country Club Plaza in Kansas City, about five miles from Toma’s home.

Toma was approached about being the “ceremonial” groundskeeper in 2019, but instead of just being there, he went to work. He worked

all day that day and the next. In the weeks leading up to the event, he got the neighborhood kids to help, a crew he said ranked up there with the best. “They were 10 to 12 years old,” Toma said of his crew. “The girl across the street was 10, and she painted the lines. There was no fooling around. There were 12 of them, and they maintained the field with me. I can honestly say they were better workers than some of the professional people I’ve worked with around the world.”

In Toma’s second year as the “official groundskeeper” of the event, the field — now officially known as George P. Toma Field — will rival any you’ll find in professional complexes. The pitcher’s mound and home plate are finely manicured, and the basepaths are painted with the same care Toma used when he did it for the A’s and Royals. Permanent fences — including a “green monster” in left — give the field a certain authenticity.

“It was a request to come out the night of the event and raise his hat when we say he’s our head groundskeeper, and he was out here for a month,” said Justin Hoover, executive director of The Battle Within. “For me, the field looked amazing a week ago. I talked to George and he said, ‘We’ll get there.’ I’ll keep complimenting him at every step, and he’ll keep saying, ‘Don’t worry, we’ll get there.’”

Perfectionism and hard work is not only the way he approaches his work, it’s what he expects of those who work with him. This year, Epic Landscape Productions donated hundreds of man hours to help

Toma get the field ready. When the owner of Epic, Marty Siler, handed his employee a shovel to move some dirt for Toma, Toma asked Siler, “Do you play golf?” When Siler affirmed the question, Toma said, “You must use a caddy.”

He even chastised me for getting there after the start of the event on the first day, even though I had no official responsibility.

The event, besides being a successful fundraiser, was a lot of childlike fun for all the participants — except for Toma. When the first day’s games were completed after nine hours of competition, Toma pulled his truck up to the field and turned on the headlights so he could repaint the field and complete other treatments. He wanted the groups that played on Saturday to have the same experience as those who played on Friday.

The fact that the field was named after him this year was nice, but Toma was focused on getting the field perfect.

“That’s nice, but I’m just the Nitzy Gritty Dirt Man,” he said. “Being out here is for the veterans and first responders. I would do anything for veterans, and then some. They went to war and gave everything they had. And now they need help. It’s my privilege to help them.”

Hoover appreciates people like Toma.

“I served as an infantryman in Iraq in 2004 and 2005,” said Hoover. “It was a very challenging year, where I saw a lot of combat. I ended up with two Purple Hearts. I got out shortly after and came back to Kansas City. I had all those experi-

ences and didn’t know what to do with them. The next decade was my ‘lost decade,’ chasing the American dream, but I stuffed all that stuff down. My step-daughter was dealing with depression and suicidology in high school, and it really brought all that ‘stuff’ back. My wife finally convinced me to find help. I went through The Battle Within curriculum four years ago, and it was life changing. For the first time, I had folks I could sit down with and share those burdens.”

Once he felt healed, he realized that he needed to stay in the environment. Now, as the executive director, he can speak to the value of the program. His whole leadership team is made up of veterans and first responders who have benefitted from The Battle Within.

“We know we have brothers and sisters sitting somewhere in their basement with a bottle or these feelings, that, left unchecked, can lead to suicide and isolation,” said Hoover. “Wiffle at the Hollow means so much, because the community comes out to support our men and women. It’s such an amazing event. I love having conversations about a Wiffle Ball event in a guy’s front yard. People look at me strangely. Then they show up and see everything, and they are amazed. It’s worth the effort.”

Just like Toma...and then some.

**SFM**

*David Smale is a freelance writer living in Kansas City.*

To donate to The Battle Within in honor of George Toma, visit <https://www.classy.org/team/324733>.



## JOHN MASCARO'S PHOTO QUIZ

### CAN YOU IDENTIFY THIS TURFGRASS PROBLEM?

**PROBLEM:**

Wet low area across turf

**TURFGRASS AREA:**

College intramural field

**LOCATION:**

College Station, Texas

**TURFGRASS VARIETY:**

Tifway 419 bermudagrass

*Answer on page 33*

*John Mascaro is president of Turf-Tec International*



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# Integrating Assessments into a Municipal/School Grounds Management Program

By Victoria Wallace and Alyssa Siegel-Miles

Assessment tools are important components of an Integrated Pest Management (IPM) plan for sports fields and landscaped areas on municipal and school properties. Assessment tools can help guide sports field and grounds managers to achieve the goals of their management program.

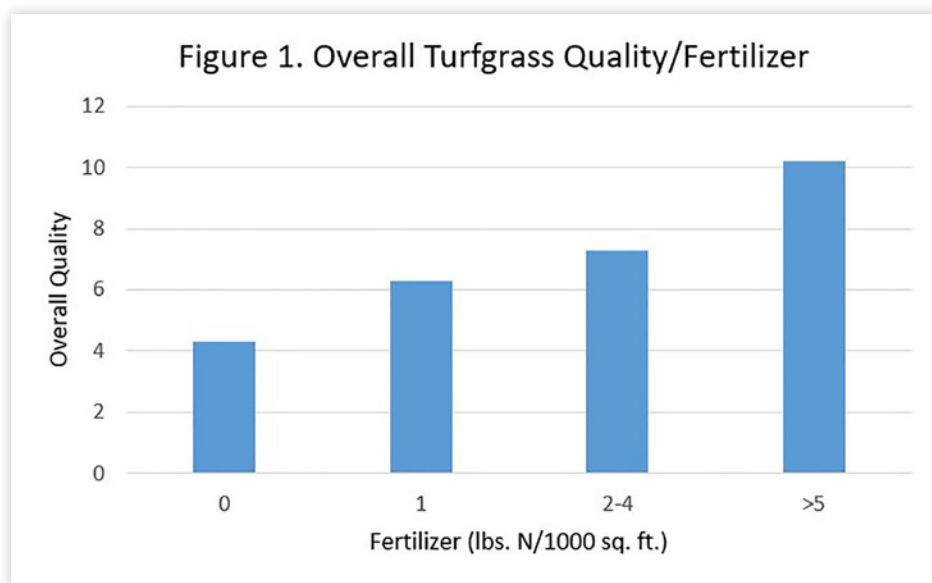
Similar, proactive evaluation methods are commonly used by businesses, teachers and other education professionals, including standardized testing to determine the effectiveness of their practices/programs. Students may utilize them to help match their interests with potential career paths. Turfgrass professionals already use tools like soil tests, STMA's Playing Conditions Index (PCI) Index, or similar university-developed assessments, such as those developed by University of Connecticut (UConn), Cornell, or Ohio State Extension programs to monitor and support maintenance practices. Data collected from these evaluations often provide answers to important questions (e.g., "Is the playing surface safe?" or, "Does the fertility program need to be adjusted?"). These answers may impact decisions about turfgrass health/field care or have financial/budgetary implications.

In 2010, Connecticut law banned the use of EPA-registered pesticides on the grounds of daycare facilities and schools of grades K-8, becoming one of the first states with a pesticide ban. Since 2010, several states have seen an increase in legislation introduced to restrict pesticide use at the state, county or municipal levels. This legislation compelled Connecticut school grounds managers (SGM) to think proactively and make fundamental changes to re-prioritize their management practices. Given the drastic changes in maintenance protocol, municipal SGM had no mecha-

nism to evaluate sports field playing surface conditions or the quality of landscapes that often are also part of their management responsibilities.

In response to the pesticide ban, members of both the UConn Extension turfgrass faculty and the Connecticut Department of Energy and Environmental Protection (CT DEEP) partnered with representatives of several municipal associations to form the Connecticut School IPM Coalition. UConn Extension faculty, who served on the coalition, created the Athletic Field Assessment Tool and Landscape Assessment Tool, which generate quantitative data to evaluate the health of both natural turfgrass athletic fields and plants in school landscapes to help SGM identify necessary maintenance practices to sustain plant health.

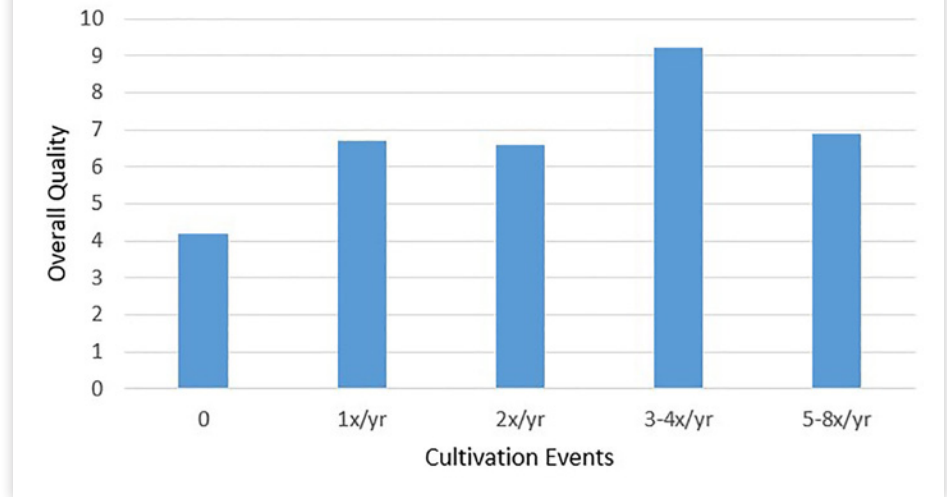
The Connecticut pesticide ban negatively impacted playing surface quality of sports fields and the aesthetics of school landscapes throughout the state. Weed management has consistently ranked as the top pest management concern for school grounds managers since the ban was enacted (Bartholomew *et al.*, 2015). Many schools and municipalities lack



the budgetary means to support the additional labor and alternative (often more costly) products required to successfully implement a pesticide-free management program. The ban severely reduced control options for many turfgrass pests, and provided few alternatives to support conventional care of the school athletic fields and grounds. Few managers implemented some of the pesticide-free management options, due to lack of irrigation or cost/labor concerns, and many exerted minimal effort toward maintenance. As a result, some schools experienced catastrophic grub damage and subsequent field closures. Those schools were forced to seek alternative locations for athletic activities, often moving games to municipal fields that had improved playing surfaces — attributed, in part, to continued pesticide use. Budget limitations forced many SGM to prioritize the maintenance of athletic fields based on field usage and to limit maintenance on non-priority turfgrass areas.

UConn Extension faculty launched a multi-year evaluation project to assess the conditions of school grounds/athletic fields using two assessment tools. This approach helped document the impact of the pesticide ban on field/landscape management changes and subsequent quality. Twenty-five school districts in Connecticut agreed to participate in the assessment project, which was supported through a USDA NIFA Extension IPM grant. Over the course of three growing seasons (2015-2017), two project assistants traveled each year to the 25 school districts, from May through August, and met with the respective SGM to assess the health of the sports fields and landscapes. One assistant evaluated athletic fields and supported training for utilizing the athletic field assessment form, while the other evaluated the landscapes and supported training for utilizing the landscape assessment form. Data collected during the 3-year project were analyzed, organized and evaluated. Sports fields were qualitatively assessed for several parameters, including percent cover/turf density, smoothness, and surface rating (stones, depressions, weeds) to generate an overall turfgrass condition rating. Each parameter was assigned a numerical value

Figure 2. Overall Turfgrass Quality/Cultivation



to a given management practice or field condition. All parameters were combined (percent cover/turf density, smoothness, and surface rating [stones, depressions, weeds]) to generate an overall turfgrass condition rating. This produced a numerical rating that quantified overall field conditions and turfgrass quality of natural grass playing surfaces. The landscape assessment form quantified the health of landscape beds using numerical metrics for cultural practices, including fertilizer, irrigation, pest management practices and observable health of plants in the landscape.

Results of the 3-year project validated turfgrass research conducted at UConn and other land grant universities, and supported recommendations by UConn turfgrass faculty in Best Management Practices for Pesticide-Free, Cool-Season Athletic Fields (Henderson et al., 2014) for the consistent use of several important cultural practices on natural sports fields maintained pesticide-free. Important cultural management practices, such as irrigation, fertilization, cultivation and overseeding were shown to be critical practices to maintain safe, uniform playing surfaces. For example, in an athletic field managed pesticide-free, turfgrass quality improves with increased applications of fertilizer and additional cultivation and overseeding events (Figures 1, 2, and 3). Irrigated K-8 sports fields had improved turfgrass establishment and improved overall turfgrass quality, while non-irrigated fields experienced a greater loss of vegetative cover and increased playing surface hardness. Assessments also enabled us to document the prevalent weed populations in each field. White clover and

annual bluegrass predominated in irrigated fields, while non-irrigated fields exhibited extensive populations of prostrate knotweed, crabgrass and goosegrass.

For landscape areas, the data generated by the assessment tool helped grounds managers assess the health of plants in the landscape setting, identify potential human health and safety concerns, and improve the function or visual appearance of the school property. Attractive, uncluttered landscaping on school properties reduces stress and improves the quality of life for school faculty, staff and students (Dyment and Bell, 2007). Grounds managers that successfully adapted to pesticide-free management programs often elected to reduce the size and scope of large landscaped areas, which are very labor intensive to maintain. Some schools increased the size of turfgrass areas, often establishing turfgrass right up to the school foundation. This enables mowing as a less labor-intensive maintenance practice, compared to hand weeding landscape beds. While plants identified to be invasive were often commonly used as primary focal point plants (e.g., Japanese barberry, burning bush, privet), many grounds managers were beginning to include native plants in pollinator gardens and in general landscape areas. It was noted, however, that removal of invasive plants was done as a means to reduce tedious, labor-intensive maintenance tasks, rather than just the desire to replace invasive plants with native plants. When possible, in newly configured landscape areas, SGM often began to select plants with a wider range of flowering times, to expand visual aesthetic interest in spring and fall, coinciding with the time school is in session, rather than the summer off-season. This not only extends the forage season for pollinators, it also provides students with greater educational opportunities to learn about pollinator health.

Consistent use of assessment forms as record-keeping tools supports IPM protocol for any school or municipality that requires an annually updated IPM plan. Data collected from assessments may be used to help develop or amend the IPM plan to support best management practices, set action thresholds,

and monitor for pests. Assessment forms can document remediation protocol or help determine needed preventive measures to support turfgrass and general plant health care.

Assessment tools can help SGMs achieve several important objectives:

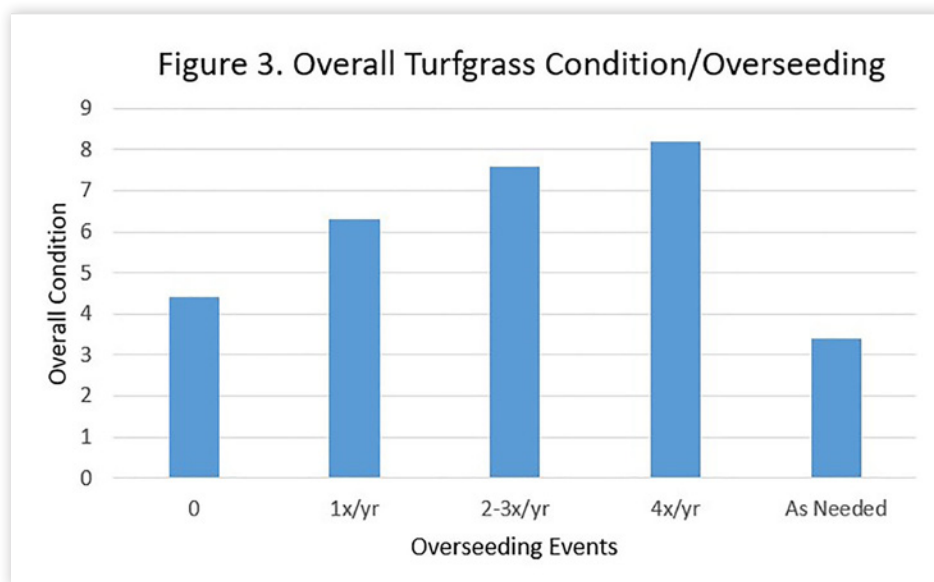
1. Skillfully articulate the maintenance required to sustain safe playing surfaces.

2. Gather data to effectively communicate with constituents (such as the value of grounds managers in maintaining safe playing surfaces and the priority of field safety). Extension faculty can help craft talking points to support communication with the public about the protocol required for maintenance of natural turfgrass sports fields and school landscapes.

3. Provide data that can help SGMs advocate for increased finances to support sports field maintenance or to document practices impacted by legislative regulations, although the message may change depending on who is the intended receiver of the message (e.g., athletic director, finance director, community members).

4. In states or municipalities where pesticides are not (yet) prohibited, assessments can provide documented, comprehensive baseline data. In the event that maintenance changes are required in the future, grounds managers can better assess the effect of those changes by comparing assessments with historical baseline data.

Grounds and sports field managers face many challenges to providing safe playing fields and weed-free attractive landscapes that enhance the community's



quality of life. Tools like assessments, which can form the basis of communication to administrators and the public, are invaluable for enabling grounds managers' efforts to be accurately conveyed. **SFM**

*Victoria Wallace serves as the state extension educator of sustainable landscapes for the University of Connecticut. With focus a on sustainable turf and landscape practices, she works closely with municipal and school grounds managers who require pesticide-free management programs to maintain their athletic fields and grounds. Wallace currently serves as chair of STMA's BMP Task Force and co-chair of the STMA Environment Committee.*

*Alyssa Siegel-Miles is a research technician for UConn Extension's Sustainable Landscape Program. She served as the assessment specialist for the landscape assessment component of this IPM project.*

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# Turfgrass Trends 2020

For our annual look at turfgrass trends, *SportsField Management* recently reached out to leading seed and sod companies for their insight. Their responses are presented here in the order in which they were received.

**BREEDERS CONTINUE TO WORK** on new varieties of tall fescue for use in sports turf. Tall fescues have shown superior wear tolerance, more stable footing, increased disease tolerance and better lateral stability — all of which increase the ability to handle increased traffic and maintain turf cover. Fescues have also exhib-

ited increased recovery and speed of repair due to high tillering and rhizomes in certain varieties. They are tolerant of lower mowing heights, have increased disease resistance, and drought tolerance — all of which offer more flexibility in the use of tall fescue

At DLF Pickseed, we are proud to introduce a new brand specifically geared to the sports turf and turfgrass producers industries — Competition Grade. Competition Grade blends and mixtures use varieties that are chosen for attributes that will aid in quick self-repair, fast establishment, early spring green up, high wear tolerance and



*University of Tulsa soccer field, closeup of Tahoma 31 bermudagrass. Photo by Michal Spin Martin, University of Tulsa. Photo provided by Sod Production Services.*

increased shear strength, active cool-weather growth, and reduce major diseases. There are three series focusing on the three major species of perennial ryegrass, tall fescue, and Kentucky bluegrass.

When it comes to seeding athletic fields, sports field managers should always use quality seed from trusted sources with varieties that have been tested by NTEP or local universities in their area for maximum performance. Seeding often — prior to and after games — is an excellent way to achieve seed-to-soil contact without interrupting play. This is important in high-traffic areas, such as goalmouths, hash mark areas and player positions, and it will increase your seed bank to assure you have new seed coming in throughout the season.

— Matt Duncan, CSFM, pro turf account manager, DLF Pickseed

**ATHLETIC FIELD MANAGEMENT** trends have continued to change for the better. One growing trend is the use of improved tall fescue varieties.

Managers have historically relied on Kentucky bluegrass for great-performing sports fields. Recently, tall fescues have been developed that combine excellent playability with spreading technology for faster recovery. La Crosse Seed offers mixes with tall fescues that exhibit rapid tillering and rhizome activity. Earth Carpet Tuff Stuff is an example of a mix with the best of both worlds — tall fescue and bluegrass.

Another major trend is the increased demand for turfgrass mixes that have improved playability and are more sustainable in diverse environments. To meet this need, La Crosse Seed has upgraded several of its Earth Carpet turf mixes with A-List-approved varieties.

A-List (Alliance for Low Input Sustainable Turf)-approved turfgrass varieties can help athletic field managers reduce input costs, as well as expensive management and labor costs. These seed products are proven to require fewer inputs while maintaining the same, or better, turf quality. Metrics evaluated include water usage, fertilizer needs, and heat and drought stress tolerance — all without the use of fungicides or insecticides.

— Jeff Wienkes, La Crosse Seed regional sales manager, turf lead

**I SEE MORE AND MORE** new sports field projects being installed as natural grass as opposed to synthetic turf. I am personally seeing a lot of sports field complexes that are putting natural grass down. Many of them are municipal fields in the eastern United States. I think it's following homebuilding where the subdivisions are being built and there's a need for new sports fields. They're building these large sports field complexes

where there are multiple-use facilities that have baseball, softball, soccer and football. In the past, they would either have been synthetic or possibly cool-season turfgrass, but now they're being done in bermudagrass.

There is a rising trend to replace synthetic fields with natural grass. When a high-profile institution like the University of Arkansas, for example, changes out its synthetic turf football field to go back to natural grass (in this case, Tahoma 31 bermudagrass), it's indicative of what is going on all over the country. I think it's because of the multiple sports injuries that can be inflicted by a synthetic field. We just saw a backlash from the NFL Players Association in September when they demanded that the NFL swap all of its synthetic fields back to natural grass. These are devastating injuries that could end a player's career. It's no wonder we are seeing a natural grass resurgence.

The change from synthetic turf to natural grass is happening in soccer, too. When the USA vs. Mexico International Friendly tournament was played in September of 2019 at MetLife Stadium in East Rutherford, N.J., (home of the N.Y. Giants), the league insisted the stadium cover the artificial turf with natural grass. Tuckahoe Turf sod farm installed Tahoma 31 bermudagrass on top of the synthetic turf, the teams played the game, and then Tuckahoe Turf rolled up the sod and removed it the day after the game. They took the sod back to the farm and planted it in the field again.

A big trend we are seeing is that new fields and renovations are leaning toward installing warm-season grasses in historically cool-season grass areas. Where you'd traditionally see bluegrass or fescue, one of the warm-season grasses that we are really seeing a lot of success with in what I would call cool-season locations, is Tahoma 31. They're installing Tahoma 31 on those fields, whereas historically it might have been bluegrass.

The change to warm-season grasses in what had been solidly cool-season regions is happening everywhere. It's happening in Ohio. It's happening in Indiana. I see it in those areas, mostly on soccer fields and high school football fields at this time. It's happening internationally as well. It's happening in Japan where they're taking out cool-season grass sports fields in northern Japan and putting in Tahoma 31. So it's not just the Mid-Atlantic or Midwest, it seems to be almost a worldwide trend.

The Philadelphia Eagles NFL team have generally planted bermudagrass for the warmer preseason then replaced it with a cool-season grass in the fall. This year, so far, the Eagles planted Tahoma 31 bermudagrass, and rather than rip it out, they overseeded it. It appears that they're planning on playing on it throughout the season — a warm-season grass in Philadelphia!

When you consider why sports field managers are switching from cool-season grasses to warm-season grasses, I think it has to do with the wear tolerance of the warm-season grasses versus the cool-season grasses, especially in soccer. It also probably has a lot to do with the height of cut, because you can mow these warm-season grasses down a lot lower and get a much faster, firmer field than you can with your traditional cool-season bluegrasses and fescues. And then there's also water concerns, disease concerns and how warm-season grass tolerates summer weather a lot better.

Tahoma 31 seems to be one of the better varieties that people are using farther north into the upper transition zone and even historically cool-season areas, because of its cold tolerance and its wear tolerance. So it seems to be on the forefront of varieties that people would be choosing from — Tahoma 31, Northbridge and Latitude 36.

— Chad Adcock, VP of business development,  
Sod Production Services (licensor of Tahoma 31)

**WHAT AN INCREDIBLY** difficult year for sports field managers. Some fields are perfect from a lack of play, and yet others have received an excessive amount of usage due to traditional sports and indoor activities being moved outside. So, what's in store for 2021?

Many fall sports are being moved to early spring. In fact, athletic directors are looking at late February/early March for starting these fall sports. However, if you are in the cool-season region, some of you are going to be plowing snow to get on your fields. Others are just going to have a great deal more play on dormant turfgrass. In addition, traditional spring sports are going to be right on the heels of this early season. Therefore, we can expect excessive amount of play on fields this spring, and the window between spring sports and fall sports is going to be even shorter.

So, what trends will we see?

Dormant seeding, even in December without snow cover, will be a huge asset. Timing is ideal, and this seeding period might be even more critical this year. If seeding tall fescue, consider higher rates than normal; and if it's Kentucky bluegrass, consider coated seed to protect from rodents and stay with traditional rates.

If your only window for seeding is next spring in the cool-season region, the "roulette option" for seeding might be the best option. Instead of putting all your seed down at one time, consider seeding more often at lighter rates.

With spring damage and a short timeframe between seasons, sod might make the most sense for repair in the spring. However, sod availability in the early spring is not always possible, and budgets maybe extremely tight this year.



Photo provided by Barenbrug

If you're using Kentucky bluegrass, there are a lot of options. Bluegrasses are not the same, and there are a group of them that do much better on sports fields. Some varieties establish quicker, and others have a better wear and traffic tolerance. If cost is going to be a concern, do not always look for the cheapest option. Consider variety performance, seed quality, poa free and seed count. Some bluegrasses have almost twice the amount of seed per pound as common types, and this can be an option of reducing your seeding rate.

In the transition zone, Bluemuda is getting more and more attention. It will be interesting to see next spring if there is more Kentucky bluegrass or bermuda in each stand. HGT, 365 and HD Sports Bluegrass blends have done very well in the various selections of bermudagrasses. Bluemuda has shown promising performance, but another year of experience will provide better guidance on how far north, and how far south they can work.

It looks like the perennial ryegrass crop was off in Minnesota and Canadian production areas in 2020,





*University of Arkansas switched its football field from synthetic turf to Tahoma 31 bermudagrass. Photo by Pat Berger, University of Arkansas. Photo provided by Sod Production Services.*

so the market is short. I'm seeing some bluegrass/ryegrass formulations that are containing tetraploid perennial ryegrasses, along with traditional perennial ryegrasses (diploids). Tetraploids are normally used as forage ryegrasses. They traditionally do not have the performance of diploids, but it will be interesting to see how they perform.

— Wayne Horman, turfgrass agronomist/consultant, Landmark Turf & Native Seed

**A CURRENT TREND** we are seeing in the sport turf market is spreading perennial ryegrasses. Natural Knit blend is well suited for use on athletic fields, because it produces a very fine, tight sod with up to double the turf density and durability. Its aggressive spreading habit helps turf fill in fast for quick recovery. Natural Knit's strong spreading characteristics helps crowd

out and control weeds. Natural Knit varieties Saguro, Allante and Savant can be used in any region that currently uses perennial ryegrasses for permanent turf applications.

Many areas have been experiencing drought conditions. Because of this, we have seen increased interest in drought-tolerant turfgrass. Using drought-tolerant turfgrass varieties allows turf managers to conserve water while still getting the many environmental benefits a healthy turf provides. Columbia Seeds varieties — Thunderstruck tall fescue, Trinity tall fescue and Savant perennial ryegrass — have all exhibited excellent drought performance in the NTEP or other university trials.

Salt problems are of great concern in the arid and semiarid regions where salt content of soils is naturally high, and precipitation is not enough to leach out the soluble salts. Problems associated with saline soils and

saline irrigation water may increase in the future as more marginal quality waters are applied to turf sites. One of the most efficient ways to improve the health of the turfgrass in salinity stress situations is to select and use salt-tolerant cultivars. Columbia Seeds ST perennial ryegrass blend is comprised using highly rated salt-tolerant varieties that could include Savant, Pepper II, Pillar II or Principal II.

— Columbia Seeds

**WE'RE SEEING A COMMITMENT** to some recent concepts in the sports turf industry. One of those is the ongoing use of fraise mowing for sports fields. Whether being used to remove *Poa annua* and rejuvenate a sports field with a traffic-tolerant product like Turf Blue HGT, removing excessive thatch accumulation, or simply transitioning to a whole other turfgrass species, fraise mowing looks to be a long-term cultural practice tool. This is being combined with the understanding of “you get what you pay for.” Managers are turning to higher-quality seeds and seeding equipment to most effectively get them established.

The Bluemuda concept continues to spread through the transition zone among sports fields and golf courses alike. The concept has been around about a decade, but we're still researching and learning more as time progresses. Initially, the concept was used to improve high-use bluegrass fields' recovery in the summer by overseeding with seeded bermudagrass varieties, then seeding bluegrass back into the stand in the fall. More recently, the industry has been pushing the Bluemuda concept into combining the best genetics on both the bluegrass and bermudagrass side.

While discussing the topic with Jerad Minnick of the Natural Grass Advisory Group, he said, “These newer varieties are incredible. Bermuda grows so fast and so strong. Bluegrass takes heat so well and fights off disease amazingly. We are truly in a time period that grass varieties are creating entirely new possibilities for high-use grass because of how they grow.” Minnick and others in the industry are seeing elevated potential in high-use sports fields using the latest genetics in bluegrass and bermudagrass, however, not entirely in the Bluemuda concept. These new genetics are so advanced in aggressiveness and disease resistance that, when combined, they might be increasing competition and decreasing peak performance. Bluemuda certainly has a place in the industry, and we'll continue to learn more of the pros and cons over time. For managers looking for maximum potential out of a high-use sports field, varietal predictability and taking advantage of recent genetic gains may outweigh the need to test and implement Bluemuda.



Photo provided by La Crosse Seed



Photo provided by La Crosse Seed

Another trend that is likely of no surprise is the push to maintain grasses at a lower and lower mowing height. We see this being done more frequently with tall fescue, with some looking to take the grass well below 1 inch. The desire here is to create a high-quality field while retaining attributes known to the species such as drought tolerance and low nutrient requirements. Taking some of these grasses to lower heights can be done, but comes with its own set of challenges. While drought tolerance capacity will be reduced at lower mowing heights, you can still expect performance advantages compared to other less drought-tolerant species such as perennial ryegrass. Growing at these heights will obviously require more applications at smaller amounts to match the growth rate, but will likely require more nitrogen (N) and other nutrients than

typically required of the species at taller heights of cut. As another forewarning, tall fescue tends to be high in clipping yield compared to Kentucky bluegrass and perennial ryegrass, resulting in the need to stay on top of regular mowing events. Turfgrass breeding is pushing to increase turfgrass density within tall fescue, which will help with competition at low mowing heights against grassy weeds such as *Poa annua*, so newer genetic gains can see higher turf quality and performance at lower mowing heights.

Time will tell of the complete impact COVID-19 has had on the seed industry, but the indication is that it has increased seed demands in some of the turfgrass industries. Seed retail markets have seen high demand with many homeowners in the United States quarantined at home, spending time and money on home improvement. Golf and sports turf haven't seen the same scale of demand as retail, but have slowly grown as much of the country slowly opened back up in summer and fall. Golf has seen large amounts of rounds being played, as it is one of the few accepted socially distanced activities in even the hardest hit areas of the country. Sports turf isn't quite back to full capacity, and is unknown how long it may last. Early on in spring of 2020 we saw many projects in sports turf with little play, allowing some to get to much needed turf care. This uptick in projects seemed to gradually reduce throughout 2020 as the year winds down and more uncertainty approaches.

High demand in the seed industry has led to some slight increases in prices. The industry is tight on perennial ryegrass, but longer in tall fescue. Supply and demand for ryegrass and fescue is very cyclical in nature, and is tied to the Oregon Grass Seed Bargaining Association (OGSBA). Just a few years ago, tall fescue was in high demand and low supply just as we're seeing in perennial ryegrass today. The bargaining of prices from seed growers and seed companies is cyclical, but has stabilized pricing in general, becoming somewhat predictable based on seed inventories. In the end, the best practice as a sports field manager is to plan known projects and seek seed needs well in advance. With turfgrass performance at the forefront of the sports industry, settling for substandard genetic quality due to low inventory can be frustrating. During these times of high demand, don't be afraid to reach out to your local distributors or even seed companies directly to see if they can be of assistance.

— Micah Gould, market development manager,  
professional divisions, Barenbrug

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# Need Expert Advice? Get Away from Google

By Mary Helen Sprecher

Maybe you have an athletic field that is showing its age. Maybe you want to discuss some of the options available to you regarding playing surface, lighting, infills, how to mark an existing field to host more sports or even how to purchase some pole vault standards.

The bottom line: These are all important issues that affect both the playing quality of your field and the safety of your players. You need someone with specialized experience to help you find the answers. Do you really want to trust anything that important to a Google search?

In order to find the right person to do the job, it's essential to eliminate those who do not specialize in the work at hand. General contractors have many uses; however, in order to find athletic-specific design and construction professionals, it's often better to skip the search engine and go to an organization whose membership is devoted to sports venues.

The American Sports Builders Association (ASBA) is the national organization for builders, designers and suppliers of materials for sports fields, running tracks, tennis courts and indoor and outdoor courts and recreational facilities. It offers — free of charge — a directory of its members, categorized by state, as well as by profession.

## ONLINE DIRECTORY USE

By going to the ASBA's website, [sportsbuilders.org](http://sportsbuilders.org), it is possible



to access a complete list of professionals available. The directory is literally in the center of ASBA's home page, with the option to either search by company or find a Certified Builder.

The "Search by Company" feature allows the user to select a builder based on a specific state, specialty (such as sports fields) and/or organization type (Builder, Designer or Supplier, for example). It is possible to select a specific state, and a specialty within that state, or to further refine the

search to include an organization type.

Once the search feature is engaged, the user is presented with a full list of ASBA members who fit the search criteria. Full contact information is listed, including company name, address, phone number, website, e-mail and even specific information, including:

- Type of work the company does (Sports Fields, Indoor Court Sports & Recreation, Outdoor Court Sports & Recreation, Tennis, Running Tracks, etc.)
- Company description, including any subsets of construction, such as fencing, drainage, etc.
- States/territories: Where the company works or what areas it covers
- Type of organization: Builder, Design Professional, Supplier, etc.

The online directory is available 24/7, meaning it is ready whenever information is needed.

## BID INFO REQUEST

Those who have a specific project in mind (for example, the complete resurfacing of a natural grass field), and who wish to be contacted by companies interested in bidding on, or expressing interest in, the project should

complete one of the ASBA's online Bid Info Request Forms.

The form allows the user to specify the type of project being built (or even being considered) and providing the ability for ASBA members to get in touch and offer information or assistance. This feature is also offered on the home page and is a free service. Just look for it in the blue toolbar at the top, or type <https://sportsbuilders.org/page/BidInfoRequest> into the address bar.

### CERTIFIED BUILDERS

ASBA offers a voluntary certification process to its builders. Certification allows a non-governmental agency, such as ASBA, to validate an individual's qualifications and knowledge in a specific area of professional practice based on a set of pre-determined standards. In the case of field, tennis or track certification, the American Sports Builders Association is validating qualifications and knowledge as a field, tennis court or track builder.

ASBA offers multiple certifications:

- Field certifications:
  - CFB (Certified Field Builder), which indicates knowledge of both natural and synthetic fields;
  - CFB-N (Certified Field Builder-Natural Turf)
  - CFB-S (Certified Field Builder-Synthetic Turf)

- Tennis courts: CTCB (Certified Tennis Court Builder)

- Running tracks: CTB (Certified Track Builder)

ASBA's certification program is open to all builders engaged in sports construction. To qualify for initial

certification, candidates must meet the following criteria:

- At the time of application, the candidate must have had a minimum of three years of experience in sports construction.
- Builders must demonstrate 100 eligibility points from specific areas such as project administration, site, sub-base and base work, layout, surfacing and marking, and more depending on the certification desired.
- Each candidate is required to provide three references that can verify his/her work experience and eligibility. References must have first-hand knowledge of applicant's work experience.

- Recertification is required every three years.

The Find A Certified Builder search feature is also found on the ASBA's home page, right below the "Search by Company" feature. Like the other aspects of the online directory, it is free to use.

### Hard copy of directory

Those who would rather have a free copy of ASBA's directory can request one by calling 866-501-ASBA (2722) or via e-mail at [info@sportsbuilders.org](mailto:info@sportsbuilders.org).

### OTHER PUBLICATIONS

ASBA's technical publications, including the popular and well-regarded Construction and Maintenance Manual series, are constantly being updated, and can be purchased by going to the "Publications" tab on the blue toolbar at the top of the page. They are available either in electronic form or hard copy, and include the following:

### **Pickleball Courts: A Construction & Maintenance Manual (2017)**

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### **NEW! Running Tracks: A Construction and Maintenance Manual (2019)**

This book promotes the quality design, construction, maintenance and repair of track facilities by providing information to facility owners, administrators, coaches, builders, architects and engineers.

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Additional information is available from ASBA at 2331 Rock Spring Road, Forest Hill, MD 21050, by phone at 866-501-ASBA (2722) or via e-mail at [info@sportsbuilders.org](mailto:info@sportsbuilders.org). **SFM**

# Sports Field Design Responds to Life Amid a Pandemic

By Jason Pollard

The novel coronavirus pandemic has changed life as we know it. The economic impact has forced organizations in every industry, including the sports world, to evolve. The face of baseball and softball infields is changing, and so is the need for facility owners to reduce costs while continuing to properly maintain their fields. As designers, we have needed to explore new strategies to support safe fields for athletes that meet our end users' expectations and budgets.

Many designers offer a good, better and best approach to fulfill sports field requirements. If the best solution is used currently, it might be too costly in the future if reduced budgets and spending restrictions are applied. It's essential to weigh additional options to ensure you can sustain the same high standards when maintaining your fields for the upcoming seasons.

Most of us appreciate grandma's famous dish or a meticulously prepared dessert; two things comprised of a precise list and ratio of ingredients. One slip up or missed step could throw everything off. Baseball and softball field managers understand the comparison of a skinned infield mix to a delicate recipe. It takes time and repetition to perfect this material, and even then, you need to evolve alongside it. The infield mix is a blend of three simple soil components; sand, silt and clay. It seems basic on the surface,

right? Well, that blend is very complex below the surface and has been giving field managers headaches for decades.

With 70 percent of the game played on the infield, it's important to get it right. What do we recommend when it is clear the infield mix is not operating at maximum efficiency? The first question to ask is, "What is the biggest complaint about the field? Is it too hard, too soft/loose, is it poor at handling moisture, or are those pesky lips at the infield/outfield grass transitions causing a safety concern?" With restricted spending for many field owners, doing the best thing for our fields may not be financially practical in this economic climate. Instead of merely taking a stab at a remedy, we will always recommend getting the infield material tested. It is difficult to understand the soil mix needs until you know what it's

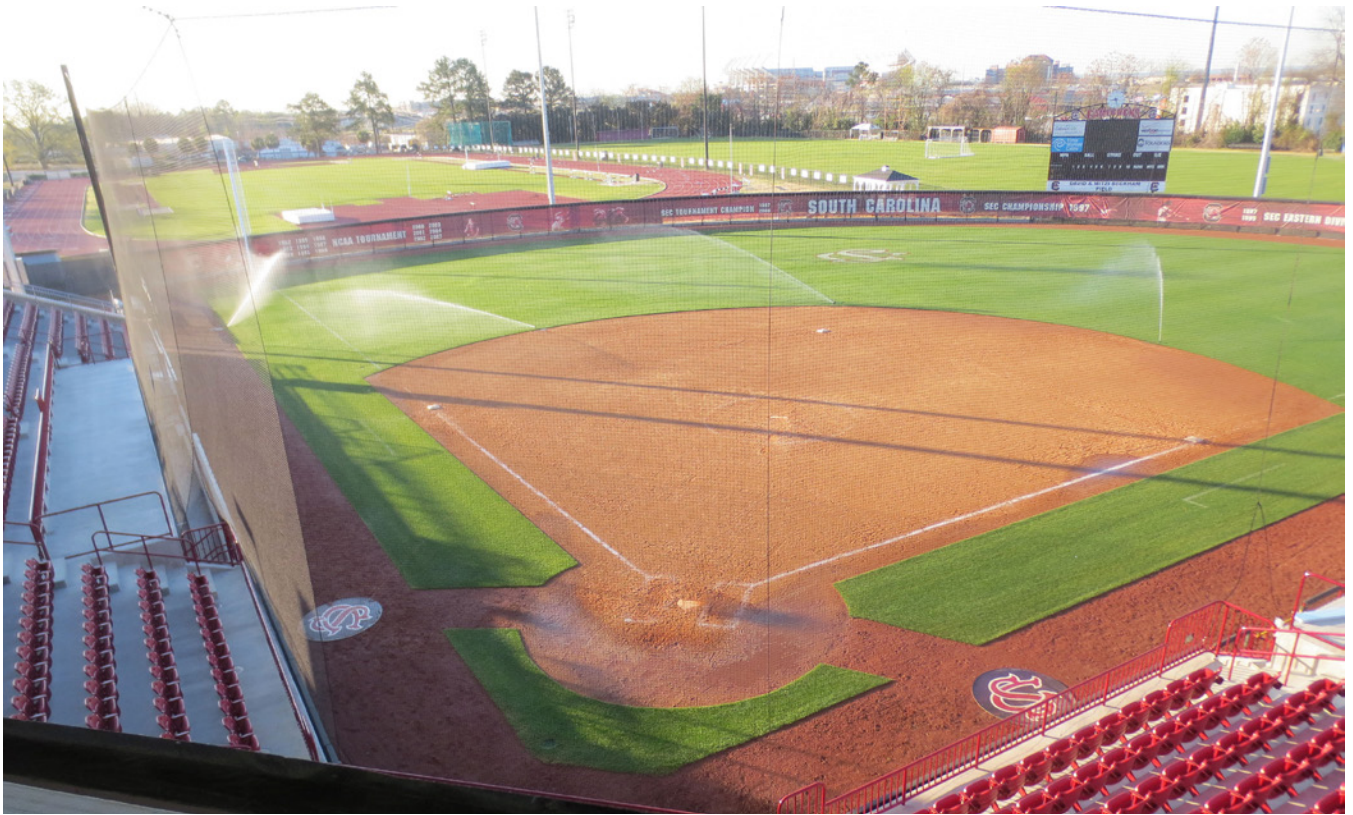
made of. Arguably, the most important test to run is a particle size analysis (ASTM 6913) on a representative sample to determine the individual percentages of sand, silt and clay, and a breakdown of sand fractions from very coarse to very fine. This test is relatively

inexpensive, but will definitely save the owner time and effort in the long term.

The typical infield mix should have an overall sand content between 60-75 percent and a silt/clay content between 25-40 percent. The recommended ratio depends not necessarily on the level of competition, but also on the availability of maintenance staff and water. The overall sand content of the material determines the level of maintenance required. More sand typically equals less maintenance. Clay is responsible for moisture retention, and silt binds the sand to the clay. Breaking this down further, the particle size and shape within the overall sand component is vital in determining the mix's structural stability. The larger and more angular the sand particles, the more stable it can feel underfoot. Ideally, more than two-thirds of the sand



*Drainage issues*



should be medium and coarse. A larger portion of fine, silty sands can spell trouble for many types of soil, with infield mix being no exception. The ideal ratio of silt to clay (SCR) is 0.5 to 1.0 (silt/clay) to make everything work together.

After testing the infield mix, other important aspects to look at are the surface planarity, field slope, edge build-up (lips), and moisture management. Even the best material won't perform to its highest potential without being graded appropriately to utilize surface drainage. It's recommended that a 0.5-1.0 percent slope be provided from the middle of the infield toward the outfield and foul territory areas. Regarding planarity, otherwise known as surface smoothness, avoid any depressions greater than ¼ inch over a 10-foot span. Anything greater will increase the likelihood of birdbaths presenting after even

moderate rain events. We recommend laser grading a baseball or softball infield once a year, if possible, to alleviate standing water. Regular checks along the edges or where the infield mix meets the grass are crucial to keeping your infield safe. The lips that form here are from improper dragging where extra material is thrown to the infield and outfield grass to build up over time. The drag should never move faster than a person can walk. Finally, water management is possibly the most important factor affecting the overall performance of skinned surfaces. The water content affects both the ball and player performance. Water is needed to soften fine soils (silt and clay) and firm those coarse, sandy soils. A typical guideline is to water the surface at a rate that allows for infiltration slowly into the skin and retention for a considerable

amount of time. An infield mix's optimal moisture content is between 4-12 percent, where the soil receives natural moisture binding by surface tension. This creates a damp soil consistency, which is ideal for athlete performance. A well-balanced infield mix will maintain this optimal level of moisture for the longest possible timeframe.

When the particle size test results come back, it's time to analyze and attempt to develop a solution, keeping in mind that it's not a "one size fits all" scenario. One field's fix may not be another's — even if the two fields have the same mix. Serious consideration must be put into the availability of maintenance, water and funds to manage the fields. Once you know where your field currently stands in terms of sand (overall and particle size), silt and clay content, you can start deciding where

you want to end up. For a lot of facility owners, hiring a sports field consultant during this process is highly recommended. Others know where they want to be; they simply need to determine the correct method to get there.

There are three main options to improve the performance of your infield mix. The first option is to topdress with a conditioner, along with scarifying the existing soil. Calcined clay is one of the most common conditioners and made of montmorillonite clay heated to extremely high temperatures (1,200 degrees Fahrenheit) to form granules of clay that remain hard even when wet. They can absorb excess water, hold onto it, and then release it when conditions become dry. After scarifying the existing infield mix (up to 1/2 inch), a thin layer (1/4 inch) of calcined clay conditioner product could be applied as a topdressing. The advantage of this option is the lower cost and the ability to create a consistent playing surface. The disadvantages are that topdressings aren't long-term fixes and can't continue to be used year after year. Eventually, your infield elevation will get too high relative to the adjacent grass areas.

The second option is to amend the existing material using an engineered soil mixture and till to a depth of 2 to 3 inches for optimal blending. For a typical 90-foot baseball infield, roughly 4 to 5 tons of material would be necessary. To increase sand content, use soil with a sand content higher than your current levels. Just make sure the sand doesn't contain high amounts of fine or very fine sand, and that you keep the silt to clay



ratio between 0.5 and 1.0. To decrease sand content, use soil with a sand content lower than your current levels. To reduce the silt to clay ratio, use soil with more clay than silt. This is also a great time to laser grade your infield. The advantages of amending your existing soil are that it's still an affordable option and can be done over time, tweaking the soil as needed. The disadvantages are that results may not be seen immediately, and the entire cross-section of the infield is not homogeneous. It's highly recommended to obtain a follow-up soil test report a few weeks after your amendment to reveal the changes made. If any additional modification is required, repeat the process.

If it's clear that adjustments to the skinned area aren't producing the results you want, the third and most drastic option is to fully remove and replace your infield. This entails excavating roughly 6 inches of material, establishing a new properly sloped subgrade, and installing a new engineered infield mix. If you are considering this direction after realizing your field is too far gone, some field owners even contemplate replacing the natural skinned infield with a synthetic

turf system. This last option would come at a high cost and could put the field out of play for a substantial period of time, but it can be a full fix if done correctly.

Each of these options should be carefully considered by the field owner, manager and designer once the existing infield is tested and analyzed. In this new environment we live in, with budgets in extreme focus, small decisions must be made with

short- and long-term goals in mind. The "best" option today may not have been part of the plan just one year ago. The option that could best solve the underlying issue may not currently fit into the budget. Still, through creative maintenance strategies, we can extend the life of the field until finances allow. Those of us involved in sports field design have vital roles in the process of blending high-quality design with the needs of facility owners and the surrounding communities. We must all commit to our clients to listen to their goals, evaluate the options, weigh the costs, and develop thoughtful solutions that ultimately strike a happy balance. **SFM**

*Jason Pollard, PE, is a senior engineer at CHA Consulting with more than 12 years of experience in sports and recreation facility design, specializing in baseball/softball and track and field facilities throughout the country. His expertise includes campus master planning, project design/coordination, contract documents, and construction administration. You can contact him at [jpollard@chacompanies.com](mailto:jpollard@chacompanies.com).*



# JOHN MASCARO'S PHOTO QUIZ

## ANSWER

*From page 17*

In 2019, this three-year-old collegiate intermural field was used for soccer, ultimate Frisbee, kickball, as well as many other activities. It has a native clay base with a 4-inch sand capped soil profile. Drainage lines were also installed 12 inches deep with HDPE perforated pipe backfilled with gravel and also covered with sand. The area was in a 3-month drought with an average high temperature of 95 degrees to a maximum of 106 degrees. These extreme heat and drought conditions caused the native clay soil below the sand cap field to dry and crack. The area then received 2.5 inches of rain in a 24-hour period. This caused the sand to wash into a crack under the drainage line, leaving a 100-foot-long divot. Since a summer soccer camp was going on during this period, the damaged area was filled with sand as a temporary fix until the drainage line could be stripped, revealed, repaired, and the area re-sodded.

**Photo submitted by Brian K. Carey, CSFM, recreational sports field team manager at Texas A&M University, College Station, Texas.**

*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 e-mail to [john@turf-tec.com](mailto: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.

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# SportsField

MANAGEMENT

# The Benefits of Salicylic Acid

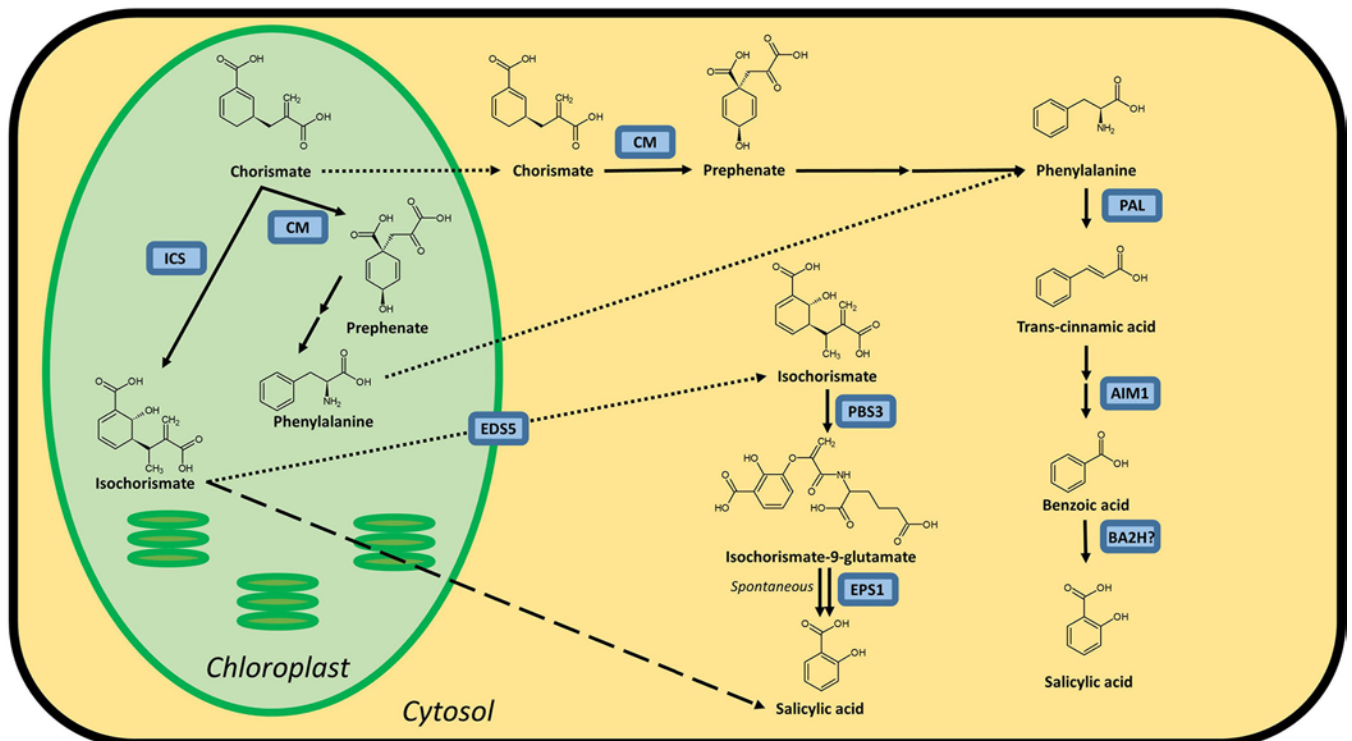
By Jeff Haag

The ability of plants to develop acquired immunity after pathogen infection was first proposed in 1933. However, most of our knowledge about plant immune signaling was generated over the last three decades, following the discovery that salicylic acid (SA) is an endogenous defense signal. During this timeframe, researchers have identified two pathways through which SA can be synthesized, numerous proteins that regulate SA synthesis and metabolism, and some of the signaling components that function downstream of SA, including a large number of SA targets or receptors.

In addition, it has become increasingly evident that SA does not signal immune responses by itself, but rather as part of an intricate network that involves many other plant hormones. Future efforts to develop a comprehensive understanding of SA-mediated immune signaling will therefore need to close knowledge gaps that exist within the SA pathway itself, as well as clarify how crosstalk among the different hormone signaling pathways leads to an immune response that is both robust and optimized for maximal efficacy, depending on the identity of the attacking pathogen.

SA is one of thousands of phenolic compounds, which consist of an aromatic ring bearing one or more hydroxyl substituents, that are synthesized by turf (Métraux and Raskin 1993). Traditionally, phenolics were assumed to be relatively unimportant, or even waste products, and thus, were categorized as secondary metabolites (Raskin 1992). However, subsequent studies revealed that plant phenolics have many important functions. Some play critical roles in defense against abiotic stresses, whereas others are important cell-wall structural components, pigments,

## Biosynthetic pathway of Salicylic Acid



## Salicylic Acid has been recognized as a regulatory signal mediating plant response to abiotic stresses such as drought, chilling, heavy metal tolerance, heat, and osmotic stress.

allelopathic compounds, or signals that influence plant-microbe interactions ([Dempsey et al. 2011](#); [Métraux and Raskin 1993](#); [Raskin 1992](#)). In addition, some phenolics play key roles in resisting pest or microbial attack, or both, by serving as constitutively produced antibiotic compounds called phytoantipicins ([VanEtten et al. 1994](#)), inducible antimicrobial compounds known as phytoalexins, or signals that activate antimicrobial defense responses ([Pietruse et al. 2009](#); [Raskin 1992](#); [Seufferth and Tsuda 2014](#); [Vlot et al. 2009](#)).

Efforts to identify the function of SA have revealed that it affects a wide range of plant processes. In addition to influencing tolerance to various abiotic stresses (chilling, heat, drought, heavy metal, UV radiation, salinity or osmotic stress) and inducing resistance to biotic (pathogen-associated) stress, exogenously supplied SA affects numerous aspects of plant growth and development, including seed germination, vegetative growth, root initiation and growth, photosynthesis, respiration, the alternative respiratory pathway, glycolysis, and the Krebs cycle ([Hayat et al. 2010](#); [Khan et al. 2015](#); [Malamy and Klessig 1992](#); [Miura and Tada 2014](#); [Rivas-San Vicente and Plasencia 2011](#)).

SA has been recognized as a regulatory signal mediating plant response to abiotic stresses such as drought ([Munné-Bosch and Peñuelas. 2003](#); [Chini et al., 2004](#)), chilling ([Janda et al., 1999](#); [Kang and Saltveit 2002](#)), heavy metal tolerance ([Metwally et al., 2003](#); [Yang et al., 2003](#); [Freeman et al., 2005](#)), heat ([Larkindale and Knight. 2002](#); [Larkindale et al., 2005](#)), and osmotic stress ([Borsani et al., 2001](#)), and there are several products currently on

the market for sports field managers at the present time. However, most of the research on this hormone has focused on its role in the local and systemic response against microbial pathogens, and on defining the transduction pathway leading to gene expression induced by SA. Again, there are several reviews on this subject ([Klessig and Malamy, 1994](#); [Durner et al., 1997](#); [Shah, 2003](#); [Durrant and Dong, 2004](#); [Vlot et al., 2009](#)). Plants perceive pathogens such as viruses, bacteria, fungi and oomycetes or abiotic stress, and respond by a characteristic innate immune response that leads to the induction of local and systemic resistance. It concomitantly leads to the production of SA, an innate immune signal responsible for transcriptional changes that result in resistance in the infected and neighboring cells ([Vlot et al., 2009](#)).

Recent evidence also suggests that SA is an important regulator of photosynthesis because it affects leaf and chloroplast structure ([Uzunova and Popova, 2000](#)), stomatal closure ([Mateo et al., 2004](#); [Melotto et al., 2006](#)), chlorophyll and carotenoid contents ([Rao et al., 1997](#); [Chandra and Bhatt, 1998](#); [Fariduddin et al., 2003](#)), and the activity of enzymes such as RuBisCO (ribulose-1,5-bisphosphate carboxylase/oxygenase) and carbonic anhydrase ([Pancheva and Popova, 1998](#); [Slaymaker et al., 2002](#)).

Again, it has been observed that the effects of exogenous SA on photosynthesis parameters differ depending on the dose and plant species tested. High SA concentrations (1–5 mM) cause a reduction in the photosynthetic rate (PN) and RuBisCO activity in barley plants ([Pancheva et al., 1996](#),

and reduced chlorophyll contents in cowpea, wheat, and *Arabidopsis* ([Rao et al., 1997](#); [Chandra and Bhatt, 1998](#); [Moharekar et al., 2003](#)). The decline of RuBisCO activity was attributed to a 50% reduction in protein levels compared with non-treated plants ([Pancheva and Popova, 1998](#)), while total soluble protein decreased approximately 68%. Exogenous SA induces alterations in leaf anatomy that consist of a reduced width of the adaxial and abaxial epidermis, and of the mesophyll tissue. Such changes correlate ultrastructurally with an increase in chloroplast volume, swelling of grana thylakoids, and coagulation of the stroma ([Uzunova and Popova, 2000](#)). Thus, the diminished photosynthetic activity at high concentrations of SA is due to its effects on the thylakoid membranes and light-induced reactions linked to them.



Stomatal closure is another important factor for photosynthesis, and is subjected to control by various phytohormones (reviewed by Acharya and Assmann, 2009). Recent evidence links stomatal closure to innate plant immunity, highlighting the role of SA in the function of the guard cells (Melotto *et al.*, 2006). In *Arabidopsis*, 0.4 mM SA induces rapid stomatal closure within 2 h and a 4-fold reduction of stomatal gas exchange (Mateo *et al.*, 2004). Endogenous SA levels promote stomatal closure upon pathogen attack.

SA is a defense hormone that has its role in both local resistances, as well as in systemic acquired resistance in plants (Zhang *et al.*, 2010). Delaney *et al.* (1994) showed that salicylic acid accumulation is essential for expression of multiple modes of plant disease resistance. They found that turfgrass cannot accumulate SA because of the expression of bacterial enzyme salicylate hydroxylase (a flavoprotein monooxygenase that catalyzes the conversion of salicylate to catechol according to reaction:  $\text{salicylate} + \text{NADH} + 2\text{H}^+ + \text{O}_2 \rightleftharpoons \text{Catechol} + \text{NAD}^+ + \text{H}_2\text{O} + \text{CO}_2$ ). In

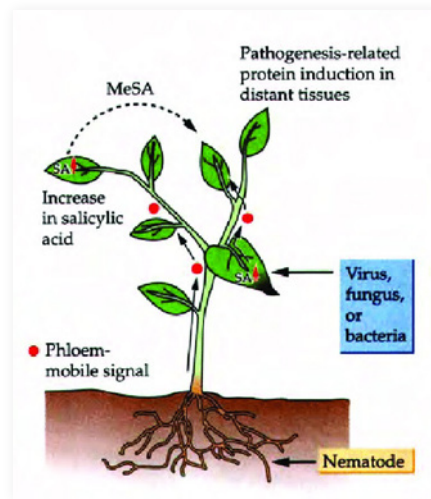
addition to making these plants unable to induce systemic acquired resistance, this defect also increased their susceptibility to viral, fungal and bacterial pathogens. Even host-pathogen combinations which are otherwise part of genetic resistance were also affected in this defect (Delaney *et al.*, 1994; Anand *et al.*, 2008).

Exogenous application of salicylic acid or its functional analogs (like 2,6-dichloroisonicotonic acid and benzo-(1,2,3)thiadiazole-7-carbothioic acid S-methyl ester) induces systemic acquired resistance

(SAR) in plants, there by providing a considerable protection against various biotic stress like resistance to pathogens (Achoo *et al.* 2004; Wang *et al.* 2005; Hayat *et al.* 2010). Depending on its involvement in local immunity, systemic acquired resistance, and its participation in both biotic and abiotic plant stress responses, salicylic acid is reported to have many therapeutic actions against several diseases and toxicities in plants in addition to its involvement in plant growth and development. Exogenous application of salicylic acid induces the expression of pathogenesis-related genes and also encourages resistance against various pathogens of viral, bacterial, oomycete and fungal origin in a variety of plants (Ryals *et al.* 1996; Shah and Klessig 1999; Pasquer *et al.* 2005; Makandar *et al.* 2006). Salicylic acid activates a group of events resulting in the inhibition of viral replication and their cell-to-cell and long-distance transmission in plants (Singh *et al.* 2011).

#### RELATIONSHIP OF SA WITH ANTIOXIDANT SYSTEM AND ITS IMPACT ON THE PLANTS EXPOSED TO STRESS

Stressful environments induce the generation of reactive oxygen species (ROS) such as superoxide radicals ( $O_2^-$ ), hydrogen peroxide ( $H_2O_2$ ), hydroxyl radicals ( $OH^-$ ) etc. in plants thereby creating a state of oxidative stress in them (Eltner, 1982, Haag, 2008, Halliwell and Gutteridge, 1988, Asada, 1994, Gille and Singler, 1995, Monk *et al.*, 1989, Prasad *et al.*, 1999, Panda *et al.*, 2003a, Panda *et al.*, 2003b). This increased ROS level



in plants cause oxidative damage to biomolecules such as lipids, proteins and nucleic acids, thus altering the redox homeostasis (Smirnoff, 1993, Gille and Singler, 1995). When applied exogenously at suitable concentrations, SA was found to enhance the efficiency of antioxidant system in turf plants. As sports field managers, many of us also use seaweed extracts to increase the antioxidant system to combat Reactive Oxygen Species.

#### BENEFITS TO COOL-SEASON TURFGRASSES

Heat stress is a major factor limiting growth of cool-season grasses in the warm climatic regions. Heat injury in cool-season turfgrasses has been associated with oxidative stress (Liu and Huang, 2000). Increases in the production of AOS, such as  $O_2^-$  and  $H_2O_2$ , are typical plant responses to biotic and abiotic stress (Foyer *et al.*, 1994, 1997). Excessive accumulations of AOS are potentially damaging to plant cells unless effectively detoxified by an antioxidant system (Foyer

*et al.*, 1994). Prevention of oxidative damage to cells during stress has been suggested as one of the mechanisms of stress tolerance (Kraus and Fletcher, 1994), which is attributed to enhanced antioxidant enzyme activity (Senaratna *et al.*, 1988). Superoxide dismutase catalyzes the dismutation of the  $O_2^-$  into  $H_2O_2$  and  $O_2$  (Eltner and Heupel, 1976). Catalase breaks down  $H_2O_2$ . Superoxide dismutase and CAT are the most effective antioxidant enzymes in scavenging AOS (Bowler *et al.*, 1992). Kentucky bluegrass is the most widely used cool-season turfgrass in temperate climates. Turf quality of Kentucky bluegrass often declines during summer.

Results have demonstrated that application of the 0.25 mmol SA solution was the most effective concentration for improving heat tolerance in Kentucky bluegrass plants. Previous studies with other cool-season turfgrasses found that 0.5 mmol SA significantly increased heat tolerance in tall fescue seedlings (He *et al.*, 2002), and 0.01 mmol SA was effective in increasing turf quality, leaf net photosynthetic rate, and suppressing lipid peroxidation in creeping bentgrass (Larkindale and Huang, 2004). **SFM**

Jeff Haag is turf specialist at Xavier University, Cincinnati, Ohio. In the past he has served as sports turf manager/golf course superintendent at Bowling Green State University, assistant sports turf manager at the University of Louisville, sports turf specialist at John Carroll University, and athletic grounds manager at Nova Southeastern University.



## Husqvarna launches suite of products and technologies

Husqvarna introduced several new products designed for landscape and tree care professionals. The new products were unveiled online during Husqvarna's Virtual Vault Tour.

### PROFESSIONAL ROBOTICS

Professional robotics users have several new innovations to look forward to from Husqvarna.

- Automower Solar Solution allows for Automower robotic lawn mowers to be installed completely off-grid and is equipped with dual outputs that can power two Automower robotic mowers at once or one Automower robotic mower and an EPOS Reference Station at once. Other features include a frame design that incorporates an electrical cabinet and solar panel together for increased stability, an expandable battery capacity if needed, and a lockable electrical cabinet to prevent theft and tampering.
- Husqvarna's EPOS Technology is a high-precision satellite-based

navigation system for the new series of professional Husqvarna Automower robotic lawn mowers, enabling mowing with virtual boundaries. Thirty-five units are currently being demonstrated at 15 locations throughout the country. This navigation system delivers accuracy down to an inch and is used to create virtual boundaries for professional robotic mowers. The new system will significantly increase the flexibility and use of professional robotic mowers in green spaces, and will further open up opportunities for areas which were previously a challenge for robotic lawnmowers — for example, areas passing sidewalks and driveways or those which are often remodeled, as well as making aerating and scarifying easier. There will be two models carrying Husqvarna EPOS technology in late 2021, Husqvarna Automower 550 EPOS and 550H EPOS.

- Husqvarna will also launch Husqvarna Fleet Services, a web platform designed to provide professional customers the opportunity to improve business operations with access to productivity insights across their entire fleet of outdoor power equipment. The Husqvarna Fleet Services Machine Sensor will allow

professionals to track equipment that is out in the field, keep a log of service and maintenance needs, and pinpoint exactly when and how long each piece of equipment was in operation at any given time. Another important feature in the Husqvarna Fleet Services platform is the Carbon Footprint Calculator. This calculator uses the Husqvarna Fleet Services Machine Sensor and data from actual machine usage to estimate CO2 emissions for each specific machine.

### LAWN AND GARDEN SOLUTIONS

Husqvarna introduced new zero-turn and walk-behind mowers, as well as walk-behind and handheld battery solutions.

- The new Z400XS zero-turn mower series is Husqvarna's premium version of the entry-level Z400 series. It has the same construction as the Z400s, but with improvements and increased comfort through a newly developed suspension seat and transmission, as well as engine upgrade and second gas tank.
- The new Z500L zero-turn mower series is Husqvarna's commercial-grade zero-turn equipped with improved heavy-duty construction, new transmission and new engine.

- The W520 gas-powered and W520i battery-powered walk-behind mower models are robustly designed for heavy duty commercial use and are self-propelled from the rear wheels. Both offer a one-touch height adjustment mechanism. The W520i can be connected to the Husqvarna Bli950x backpack battery for longer cutting operation.
- The 525HE3 and 525HE4 hedge trimmer models are designed for landscape maintenance that requires added reach. Both are equipped with the newly redesigned articulating mechanism and X-Torq engine. Other features on these new hedge trimmers models include adjustable cutting bar articulates, new engines and new starters for minimal effort.
- The 535iFR brush cutter is a bike-handled, three-in-one trimmer equipped with the T35 trimmer head, brush blade and clearing saw blade with guard used for ground clearing and removal of smaller-in-diameter trees, wood and brush. Other features include a 35cc equivalent commercial cutting performance with a battery-powered brushless motor, and it is IPX4 classified.

**PROFESSIONAL ACCESSORY ADVANCEMENTS**

In addition, Husqvarna will launch accessories to help professionals work faster and be more productive.

- Husqvarna’s new RapidReplace trimmer head is designed to simplify the reloading process. This new design lets users align, load and twist line for faster reloading, without disassembling the head. It holds up to 22 feet of .095 trimmer line, for extended runtimes. This solution is suitable for all Husqvarna gas trimmers.
- Striping kits that attach to the bottom of the cutting deck or the back

of the zero-turn, depending on the model, to create the striping effect. Kits are available only for the Z100, Z200, Z200E, Z400, Z400X, Z500, Z500L and Z500X models.

- Bucket holder and grabber mounts designed specifically for zero-turn mowers are also new this year, consisting of a bucket holder that holds a 5-gallon bucket and a grabber mount to pick up debris, along with a bracket that attaches to hold a string trimmer.
- Husqvarna’s battery-power sprayer features lithium-ion powered pumps, is easy to charge and includes a 25-inch stainless steel wand, along with three nozzles for versatile applications. The sprayer comes in a 2-gallon and a 4-gallon option.

**TREE CARE SOLUTIONS**

Husqvarna’s 540i XP and the T540i XP chain saws feature an optimized system to deliver the next step in battery performance. The T540i XP and 540i XP rear- and top-handle chain saws feature a new, ground-up design and are developed specifically with professional users in

mind. Used with the newly released Husqvarna BLi200X (T540i XP) or Husqvarna BLi300 (540i XP) batteries, the new chain saws have capabilities equivalent to professional 40cc gas chain saws, making them ideal for tree removals and smaller felling tasks. With the completely redesigned, optimized system, power has been increased by more than 30 percent compared to previous Husqvarna battery chain saws.

**John Deere debuts single-motor, high-flow snow blower models**

John Deere announced three new single-motor, high-flow snow blower models just in time for peak snow-removal season. Compatible with the John Deere compact track loaders, compact wheel loaders and skid-steers, the SB72D, SB78D and SB84D snow blowers incorporate features such as hydraulically oper-



ated poly-lined chutes and deflectors, reinforced wrappers, adjustable skid shoes and two auger options for improved performance and durability.

“We continue to expand our lineup of attachments to include additional, versatile solutions that increase the value and capabilities of our compact machines,” said Jessica Hill, program manager, global attachments at John Deere. “The SB72D, SB78D and SB84D snow blower models are the ultimate snow-handling attachments, helping clear snow faster and more efficiently, while enduring harsh winter conditions.”

The new two-stage hydraulic snow blowers are ideal for clearing snow from roadways, parking lots, driveways and sidewalks, and they move snow up to 45 feet from the machine. In addition to the standard smooth auger, the D-series snow blowers are now also available with a serrated auger option that is designed to cut through the toughest of snow conditions. No case drain connection is required on standard and high-flow models, and the direct-drive motors at the auger and impeller provide reliable performance while requiring fewer parts than previous models. The D-series models feature a 36-inch high-volume intake shroud, maximizing snow-clearing productivity.

The hydraulically activated, poly-lined chutes and deflectors enable easy snow placement from in-cab controls, making it stress free for the operator to maneuver and remove snow. The chute rotates 270 degrees using a simple, direct-drive hydraulic motor, rather than a chain and sprocket design or cables.

The simple-to-adjust skid shoes set cutting edge height to accom-

modate different surge types on the job. Additionally, the models can be equipped with replaceable bolt-on, wear-resistant, tapered steel edges and poly edges.

## Stihl Inc. announces new products and innovations for 2021

This year has certainly been unprecedented and continues to be unpredictable.

“Faced with unprecedented challenges, Stihl dealers and the many other essential American small businesses they serve played a vital role in keeping our country moving forward,” said Bjoern Fischer, president of Stihl Inc. “Much of the green industry remained open whenever possible and adapted to find new ways of doing business to support customers’ needs. At Stihl, we pledge to continue to work together to face

these challenges head on, and to provide these essential businesses with the products needed to keep the positive momentum going today and into the future.”

Stihl engineers continue to spearhead new innovations to improve power and performance.

### NEW STIHL 135 PROFESSIONAL BATTERY SERIES

Part of the professional AP Battery series, the Stihl 135 platform delivers true commercial-grade power and performance comparable to gasoline-powered tools — all with zero exhaust emissions and low noise. All products feature an on-board battery slot and weather-resistant design, allowing professional users to keep working with less downtime. The 135 platform is assembled in America with many of the same drive and cutting components used in Stihl professional gas-powered products.

■ **Stihl KMA 135 R KombiMotor.** A powerful, versatile battery-pow-





ered multi-task tool, the KMA 135 R features performance comparable to Stihl gas-powered units with the same attachment compatibility. 14 different attachments empower professional crews to efficiently take on a wide range of landscaping tasks on the jobsite.

■ **Stihl FSA 135 and FSA 135 R trimmers.** With a brushless motor and the same drive and cutting components used in Stihl professional gas trimmers, the FSA 135 models deliver professional cutting performance comparable to Stihl gas units with zero exhaust emissions and low noise. Available in loop or bike handle design.

■ **Stihl HTA 135 pole pruner.** An advanced battery-powered pole pruner that extends up to 13 feet, with commercial-grade power and durability. Features the same field-proven shaft and cutting components as found on Stihl gasoline-powered pole pruners. The Stihl HTA 135 pole pruner combines commercial-grade power and durability comparable to gas, with quiet performance and zero exhaust emissions.

■ **Stihl HLA 135, 135 K 0° and HLA 135 0°-145° extended-reach hedge trimmers.** The most powerful battery-powered hedge trimmers in the Stihl line, the HLA 135 family of hedge trimmers offer two short-shaft (K) designs, as well as one long-shaft length design, which can extend user's reach up to 60 inches. The K versions are available with either a fixed or 145-degree adjustable cutting head. The long-shaft version employs an adjustable 145-degree cutting head, allowing greater flexibility for their extended-reach trimming needs.



## Toro GrandStand Multi Force adds three more work attachments

New Toro GrandStand stand-on mower Multi Force attachments deliver more power, more versatility and more productivity. In addition to the six Multi Force tools already in the arsenal, Toro is introducing three more additions to the family:

■ **Snow blower** — Clear both tight and large spaces with the new Multi Force snow blower. At 48 inches wide, the snow blower is perfect for sidewalks, but also big enough to make quick work of driveways and parking lots. It prevents the risk of jarring impacts through a urethane

trip edge that softens any contact with obstacles such as uneven pavement, cobblestones, manhole covers and more. The lift and chute rotation are controlled by low-flow hydraulics for easy adjustments, and the blower is powered by high-flow hydraulics to ensure there's plenty of power to throw piles of snow.

■ **Leaf plow** — Clear large areas quickly with the new Multi Force leaf plow. At 55 inches wide, it moves a ton of leaves in a short time. The high-strength galvanized-steel construction not only ensures long-term durability, it provides the strength to push heavy, wet leaves. The stainless-steel tines won't damage grass or turf. When the task is complete, the plow folds up over the deck, so it fits easily on a trailer.

■ **Boss 48-inch plow** — The Boss 48-inch-wide plow clears standard

sidewalks in one pass while providing the versatility of getting snow out of tight spaces. Lifting the blade and adjusting the angle on the fly is easy thanks to the low-flow hydraulics.

In addition to the three new tools for 2020, the system also includes:

- EZ Vac powered bagger
- Pro Force blower
- Boss 60-inch plow
- Power broom
- Tine rake dethatcher
- Hooker aerator

## Kubota introduces new L60LE series

Kubota Tractor Corporation launched the new L60LE series. With the success of the launch of the L3560HSTC-LE last year, three new models have been added to complete the new L60LE series, which now offers a total of four models — two cab models and two ROPS models. Ranging from 37 to 42 gross horsepower, the new series offers an array of

deluxe quality and comfort features at an affordable price point.

“Last year, Kubota launched a single unit, the L3560HSTC-LE, based on the market-driven needs for an affordable, deluxe cab. Since then, we found that many of our customers were looking for tractors that would provide the level of quality, comfort and entry-level affordability the L3560HSTC-LE offered, but needed either a little bit more horsepower or in a ROPs version. It was with these market-driven needs that I am excited to introduce the completion of an entire L60LE series, adding three more models with a variety of sizes and power options,” said Kelcey Richardson, Kubota product manager. “The L60LE series will exceed expectations in terms of providing so many premium features found on our Grand L60 series, which maximize both performance and comfort, but without breaking the bank. The L60LE series is designed to provide maximum performance for every operator, no matter the experience level, in a wide variety of applications.”

Kubota’s new L60LE series is comprised of the L3560LE and the larger framed L4060LE, each with cab and ROPS models, offering a total of four models to choose from in the new series. This series is built with a heavy-duty large chassis, all metal hood and fenders and equipped with a Kubota-built diesel engine. Kubota’s electronic HST Plus Transmission comes standard on all models, and is designed to provide smooth, quiet operation and maximize productivity and ease of use.

Other performance features include a heavy-duty three-point hitch with a lift capacity of 2,646 pounds (24” behind the pin) on the L3560LE and 2,760 pounds (24” behind the pin) on the L4060LE. Additionally, with available options for the LA555 or LA805 front loader, the L60LE series has a loader lift capacity of up to 1,715 pounds (at pivot pin) and a front loader maximum lift height of up to 105 inches (at pivot pin). The BH77 and BH92 backhoes are performance-matched with the L60LE series to deliver more power and greater capacity. And, thanks to the full-flat deck and a quick attach/detach mounting system, the backhoes deliver optimal legroom for maximum operator comfort. A mid-PTO option can also be used with a variety of performance-matched, front-mounted snow removal implements. Lastly, the L60LE series can be equipped with a full line of performance-matched implements and attachments from Land Pride.

Kubota offers multiple deluxe standard features and options for customers throughout the L60LE series lineup. The new series includes premium features such as a larger chassis size, low engine noise,



high-performance HST Plus transmission, smooth loader operation and spacious operator platform, all at an affordable price. To further customize the tractor, Kubota offers a wide variety of tire tread types and sizes. For example, agricultural tires are available for heavy-duty field work requiring maximum traction; turf tires are designed for mowing with minimal ground disruption; and industrial tires are designed for loader work requiring a more everyday-use style tread.

The new L60LE tractors boast a wide range of ergonomically designed comfort features and functions to reduce fatigue and maintain productivity. Standard features for both cab and ROPs models include a wide, spacious operator area and standard deluxe suspension seat with swivel feature, as well as standard tilt steering, electric PTO switch, full-flat deck with rubber floor-mat, wide step, cup holder, full open hood and ground level fuel tank fill.

All cab models come standard with the wide, deluxe Grand L cab with heater and A/C. Many optional features are available to outfit the tractor to meet exact customer needs. Optional accessories include an air-ride seat, ROPs canopies, front weights, rear hydraulic remote valves, and many more to choose from based on your needs.

## Gravely unveils new mowers

Gravely unveiled new mowers designed to provide all-day comfort and industry-leading performance.

### **GRAVELY PRO-TURN EV**

Gravely launched the lithium-ion powered Pro-Turn EV, which offers swappa-



ble batteries to let users mow longer. A brushless wheel-drive transmission ensures users get the same level of power they would expect from a gas-powered model and oversized spindle motors keep the blades from slowing down when the machine hits thick grass.

### **GRAVELY PRO-TURN 600**

With the Pro-Turn 600, Gravely removed the impacts associated with traditional zero-turn mowers by adding the Operator Pod System, which isolates the driver from the machine. Top-of-the-line high-back seats make the user feel like they're in the machine instead of on the machine. Through in-depth cut quality research, testing and engineering, Gravely implemented a system to improve performance — the X-Factor 3 Deck — its solid-steel construction also promises better grass disper-

sion. The mower features radial tires for better traction on varying landscapes and an easy-to-use height-of-cut dial to adjust the cutting deck in ¼-inch increments.

### **GRAVELY PRO-TURN Z AND ZX**

The Pro-Turn Z and ZX deliver Gravely performance at a lower price point. Suspension forks absorb impacts, improve the ride and reduce fatigue while high back seats keep operators comfortable all day.

Gravely installed a new suspension seat on the ZX model that complements the suspension forks by absorbing the smaller vibrations in addition to the larger impacts.

Fabricated decks feature a reinforced leading edge for better grass dispersion and a unique, tubular frame brings a higher level of durability and hillside stability. **SFM**

FROM THE TWITTERVERSE

The following are some industry Tweets from the past month:



@VT\_groundscrew

The blank canvas is now a masterpiece. GO HOKIES

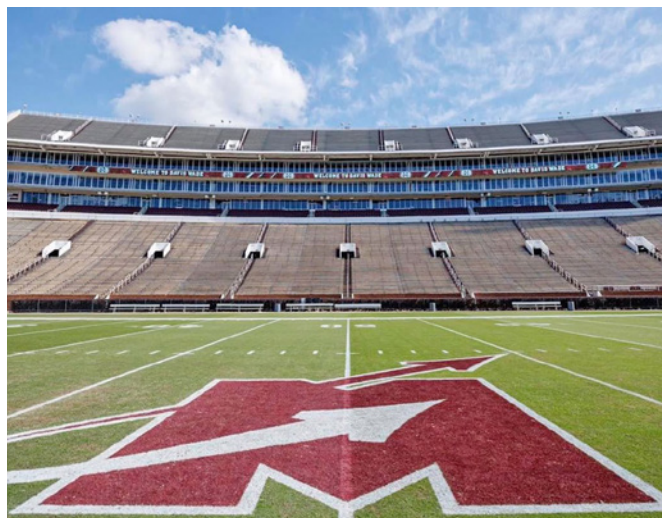
**NOVEMBER 6**



@BPolimer

First snowfall of the season.

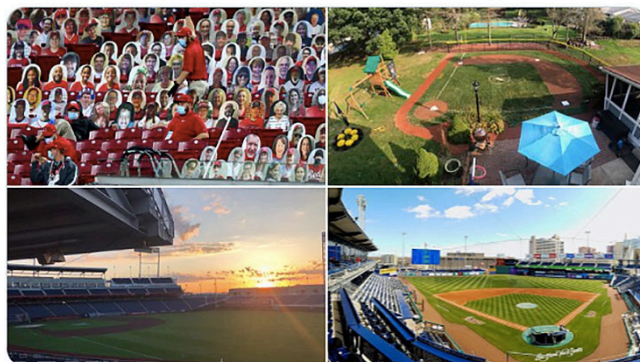
**OCTOBER 30**



@MSUhistory

What a picture.

**NOVEMBER 6**



@FieldExperts

With the 2020 baseball season officially closed, we tip our caps to the STMA members who displayed their compassion and creativity. From canceled seasons, to backyard diamonds, to doubling as cheering sections we are proud of all those who went above and beyond this season.

**OCTOBER 29**



**@JodyGillTurf**

I spy @masonmturf working in the rain. @bvschools natural grass athletic fields are in good hands.

**OCTOBER 21**



**@Clintsman\_STM**

Welcome to stripe town at Ensworth! Partee rye from @SimplotTurf is putting on a show. #morethanjustfertilizer #partnerup #ryegrassstandard

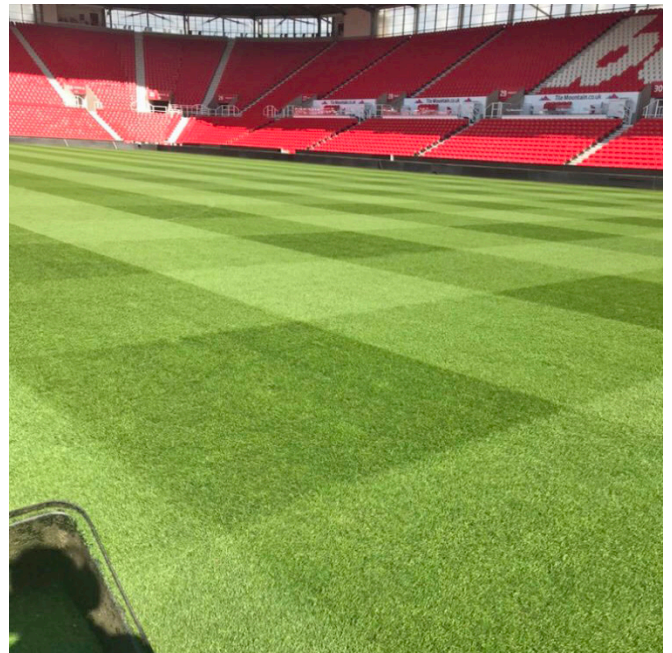
**OCTOBER 20**



**@Zona\_TURFlete**

Getting irrigation ready for the season. @ArizonaFBall

**OCTOBER 21**



**@genuineturbo**

So today marks my 1 year anniversary at Stoke! Absolutely loved every minute of it! Here's to many more!

**OCTOBER 16**

# STMA Membership – Renew Now and Attend Conference for Free!

The holidays are here – and so is the end of STMA’s membership year. Every year, STMA works hard to produce new educational materials, recognize certification and award recipients, and push for the safety of all fields around the globe. STMA urges all members to avoid interrupted membership by renewing before the Dec. 31 year-end. And, by renewing, you obtain access to STMA’s virtual conference, Jan. 12-13, 2021 at absolutely no charge. The conference also has two hours of continuing education each week following the conference on Tuesdays: Jan. 19 - March 2.

Your STMA membership is an investment for your future, that’s why STMA prides itself in providing a membership that connects you with a network of peers who are willing to share their best practices, provides opportunities for education to help you do your job better, and quick access to information and resources to help you save time. If you are considering joining STMA, the recognized leader in championing the sports field management industry and its professionals, STMA is sure to have



a membership for you. STMA has specific membership categories for every professional in the sports field management industry.

STMA member Trevor Odders, CSFM, City of Las Vegas, park maintenance field supervisor, had the following to say about the value of membership:

“My biggest challenge this year was dealing with the unknown caused by this pandemic. The virtual

Town Halls put on by STMA were extremely valuable to me and my organization. The ability to listen to and speak with my peers around the country about their experiences gave me new ideas and solutions for the many problems that seemed to be arriving daily.”

Renew today at [STMA.org](http://STMA.org).

## Become a sponsor for STMA's virtual conference

Sponsors receive excellent recognition before and during STMA's two-day virtual conference. There are several sponsorships available including:

### Virtual Public Chat Sponsor (\$3,000, 1 left)

- Hotlinked logo above public chat in the lobby and on each page within the platform.

### Session sponsor (\$1,000 each)

- Hotlinked logo.
- Logo or gif on splash screen before session begins.
- Opportunity to play 30-second commercial during the session.

### Attendee confirmation e-mails (\$1,000)

- Sponsor an attendee informational e-mail.
- Hotlinked logo and opportunity to give a conference "teaser." Example: "Visit our virtual booth and win a chance to receive a prize," or "Visit our booth to learn more about our new product line."

### Networking group sponsor (\$2,000 each)

- Host a group up to 25 attendees.
- Logo and named sponsor of the group.
- Many small groups still available (CSFM, First Timers, International, Women in SFM, Chapter Leaders, general networking).

### New Product Showcase (\$500 – Limited to 20 companies)

- Show off a new product with a live video feed during a scheduled time period.
- Push notifications to drive attendees to your booth and your scheduled showcase time.
- Receive notifications in live time as to who is visiting your virtual booth.

### Gamification (\$300-\$750)

- Encourage attendees to request information from you or interact with you in your virtual booth.
- Depending on the level of interaction you can elect to give attendees a code that will be used to redeem points. Points can then be exchanged for prizes.

Don't see something that is a good fit for your company? Contact [STMAinfo@STMA.org](mailto:STMAinfo@STMA.org) and STMA will work with you to design a special sponsorship.

## STMA forges partnership with USA Baseball

The STMA Board of Directors voted unanimously at its fall board meeting to partner with USA Baseball on updating its field maintenance manual. STMA and USA Baseball are co-branding the manual, which will be available online. STMA member-academics and practitioners will be involved in the review and updating process.

The manual is scheduled for release in January 2021.

## STMA releases new educational resource

STMA released a new educational resource on preparing your warm-season sports fields for a successful spring season.

If your fall sports season is moving to spring, properly preparing your field in the fall will give your turfgrass the best chance to be ready for play in the spring. Developing and implementing a plan to combat cooler weather conditions will not only help your natural grass fields survive but will also jump-start spring growth and result in overall healthier turfgrass throughout the year. By beginning your winter preparation at the end of the summer and continuing it throughout the fall, you will be on your way to managing an even better field next year. The success of your field is largely dependent on how your field overwinters.

Read the full article at <https://www.stma.org/preparing-your-warm-season-sports-fields-for-a-successful-spring-season/> **SFM**





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## STMA Affiliated Chapters Contact Information

Sports Turf Managers Association of Arizona: [www.azstma.org](http://www.azstma.org)

Colorado Sports Turf Managers Association: [www.cstma.org](http://www.cstma.org)

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

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

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

Gateway Chapter Sports Turf Managers Association:  
[www.gatewaystma.org](http://www.gatewaystma.org)

Georgia Sports Turf Managers Association: [www.gstma.org](http://www.gstma.org)

Greater L.A. Basin Chapter of the Sports Turf Managers Association:  
[www.stmalabasin.com](http://www.stmalabasin.com)

Illinois Chapter STMA: [www.ILSTMA.org](http://www.ILSTMA.org)

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

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

Iowa Sports Turf Managers Association:  
[www.iowaturfgrass.org](http://www.iowaturfgrass.org)

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

Mid-Atlantic STMA: [www.mastma.org](http://www.mastma.org)

Michigan Sports Turf Managers Association (MiSTMA): [www.mistma.org](http://www.mistma.org)

Minnesota Park and Sports Turf Managers Association: [www.mpstma.org](http://www.mpstma.org)

MO-KAN Sports Turf Managers Association: [www.mokanstma.com](http://www.mokanstma.com)

New England STMA (NESTMA):  
[www.nestma.org](http://www.nestma.org)

Sports Field Managers Association of New Jersey: [www.sfmanj.org](http://www.sfmanj.org)

North Carolina Chapter of STMA:  
[www.ncsportsturf.org](http://www.ncsportsturf.org)

Northern California STMA:  
[www.norcalstma.org](http://www.norcalstma.org)

Ohio Sports Turf Managers Association (OSTMA): [www.ostma.org](http://www.ostma.org)

Oklahoma Chapter STMA:  
405-744-5729; Contact:  
Dr. Justin Moss [okstma@gmail.com](mailto:okstma@gmail.com)

Oregon STMA Chapter:  
[www.oregonsportsturfmanagers.org](http://www.oregonsportsturfmanagers.org)  
[oregonstma@gmail.com](mailto:oregonstma@gmail.com)

Ozarks STMA: [www.ozarksstma.org](http://www.ozarksstma.org)

Pacific Northwest Sports Turf Managers Association: [www.pnwstma.org](http://www.pnwstma.org)

Southern California Chapter:  
[www.socalstma.com](http://www.socalstma.com)

South Carolina Chapter of STMA:  
[www.scstma.org](http://www.scstma.org)

Tennessee Valley Sports Turf Managers Association (TVSTMA): [www.tvstma.com](http://www.tvstma.com)

Texas Sports Turf Managers Association:  
[www.txstma.org](http://www.txstma.org)

Virginia Sports Turf Managers Association: [www.vstma.org](http://www.vstma.org)

Wisconsin Sports Turf Managers Association: [www.wstma.org](http://www.wstma.org)

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## JOHN DEERE

## Q&A WITH PAMELA SHERRATT

### **Q:** Can you provide an update on weed control products?

**A:** I recently sat down with Dr. Dave Gardner from OSU to get the scoop on the newer herbicides for weed control. (Note: at time I write this, some are still pending registration.)

#### **Newer herbicides for broadleaf weed control**

Arylex is the branded name for the new active ingredient haluaxifen-methyl from Corteva. Arylex is a synthetic auxin herbicide, but in a different chemical class, called Arylpicolinates, and this should help with some herbicide resistance issues that have been observed in turf. It mimics plant growth hormones, and disrupts the weed's growth process. Arylex is particularly active on plantains but also has good activity on a variety of broadleaf weeds. GameOn combines Arylex with 2,4-D choline (a unique formulation of 2,4-D) and fluroxypyr, and is labeled for control of more than 100 broadleaf weed species, including dandelion, broadleaf plantain, chickweed, clover and henbit. It has lower volatility and reduced odor. The product is also reported to be rainfast in one hour. Note that GameOn is not labeled for residential use.

Flumioxazin has been available for many years, marketed as SureGuard or Broadstar, for weed control in nurseries, container ornamentals or landscapes. Do not, EVER, apply SureGuard or Broadstar to turfgrass (unless it's dormant bermudagrass). Having said that, researchers at NuFarm have figured out a way to make flumioxazin safe for use in turfgrass, and it is in a newer formulated herbicide called Sure Power. Along with flumioxazin, Sure Power also contains 2,4-D, triclopyr and fluroxypyr. Sure Power is labeled for the control of 250 weed species. It is very effective, but particularly on a couple of weeds (ground ivy and wild violet) that have been very difficult for turfgrass managers to control. Research studies conducted at The Ohio Turfgrass Foundation Research and Education Center show that control of ground ivy after application of this product can exceed 80% within three days and be near 100% at seven days after application. Some issues with

injury to turfgrass have been reported. These tend to last about two to three weeks, and are more likely to occur if used during early spring or early fall. Sure Power is a good option for broadleaf weed control either in summer or in late fall, when the grass is green but not actively growing.

#### **Newer products for control of grasses**

Methiozolin is a new active ingredient in the herbicide PoaCure that, at long last, the EPA has granted registration. It is very effective for control of annual and rough-stalk bluegrass either preemergence or postemergence. It is very safe on cool-season turf. Currently it is labeled for golf turf, but labels for sports and sod farm use may occur in the future. The product has been very effective for annual bluegrass control in OSU trials.

Crew herbicide is a new combination product from Corteva that combines dithiopyr (originally marketed as Dimension) and isoxaben (originally marketed as Gallery). It is safe on cool- and warm-season turfgrasses, and can also be used over the top of more than 400 species of ornamentals that are common to Midwest landscapes. It works as a preemergence herbicide for the control of annual broadleaf weeds, as well as crabgrass, goosegrass and annual bluegrass.

Q-Ball herbicide and Drive herbicide both contain quinclorac. Q-Ball is a new product from NuFarm. Quinclorac can be quite effective on leaf stage crabgrass, which is prevalent until mid June. Exercise caution with this timing though, as sometimes the crabgrass grows back. Alternatively, quinclorac is also effective on late stage (>6 tiller) crabgrass as well. In addition to controlling crabgrass, quinclorac can be quite effective on broadleaf weeds such as dandelion and white clover. **SFM**



#### **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](mailto: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](mailto:grady_miller@ncsu.edu)

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