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# Golfdom

06.22

**PLUS**  
Focus on fungicides  
Matt Shaffer debut column  
Surfactant influence on PGRs

Experts advised us on recent advancements  
that we should pay attention to — and  
we sought to learn more ...

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## Technology and agronomy

Experts advised us on recent advancements that we should pay attention to — and we sought to learn more

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# Golfdom

Seven-time winner of the national **Folio: Award** for editorial excellence

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"It's the busy season for golf, and our biggest battle isn't making our deadlines; it's earning your valuable time. This issue pulls off that feat."

**SETH JONES**, *Editor-in-Chief & Associate Publisher*

# Home-field advantage

**A**ll of a sudden, we're midway through 2022. It's the busy season for golf, and our biggest battle isn't making our deadlines; it's earning your valuable time. This issue pulls off that feat. With so much going on, I'll skip the chatter and get right to the bullet points because we have some exciting things cooking:

- The *Golfdom* team has grown by three in recent months. Will that mean more time for your pal Jonesy to get out on the golf course? Probably not ... but collectively, we'll be able to visit more golf courses! Please welcome Digital Editor Sydney Fischer, Managing Editor Jonathan Delozier and Associate Editor Rob DiFranco. Rob has been with the magazine the longest of the three (a grizzled veteran at five months now), and he celebrates the occasion with his first cover story for the magazine. We tasked Rob with the fun assignment of reaching out to a bunch of Friends of *Golfdom* (FOGs) to ask their opinion on what's the next big up-and-coming technology for the industry.

Those responses, and write-ups with product experts on each, begins on page 16.

- A longtime FOG is Matt Shaffer, legendary in the industry for fast greens and hilarious stories. At the 2022 GCSAA Conference and Show, I asked Matt if he would be interested in writing a column for our humble magazine. His response was typical Shaffer: "I'd do anything for you guys." Matt's first column appears on page 13. Good news: Matt writes just like he talks.

- Recently, three members of my team traveled from Cleveland to visit me in northeast Kansas. Group Publisher Bill Roddy, Publisher Craig MacGregor and Editor Christina Herrick all made the trip. I showed them

my house and office, but we spent most of our time in the Hall of Justice ("The HOJ" for short, my Morton Building-turned-sports-bar.) It was a thrill to host them. Miller Lite was on draft, cheeseburgers were cooked on the Blackstone and the jukebox, as always, was set to free play. The occasion was the 2022 Turf and Ornamental Communicators Association's (TOCA) annual meeting, held in Kansas City. The conference included a behind-the-scenes tour of Arrowhead Stadium and a giant spread of Joe's Barbecue at Boulevard Brewery. As cool as it was to stand on the 50-yard-line at Arrowhead, the fondest memory will be the scene in photo three in this month's *Golfdom*

Gallery. I hope more of my friends in the industry will take the exit off K-10 before entering Lawrence, Kan., so I can get more photos just like that one in future issues.

- At the meeting in Kansas City, the annual TOCA awards were handed out. *Golfdom* nabbed 13 awards in total (see page 8 for a complete list), including a best-in-show award for our January 2021 cover ('21 at last.) I'm excited we had the *Golfdom* name called out so many times during the awards ceremony. Maybe I had that home-field advantage working my way? Most of those awards are a group effort, and most of them come to fruition through collaboration with our many FOGs around the country. So, thank you to everyone who helped us achieve success in 2021.

- As I stated above, suddenly, we find ourselves midway through 2022 ... and it feels like we're off to a good start. We have some fun projects in the works for the remainder of 2022. But as a reminder, if you have a good story in your neck of the woods, let us know. The team is growing, and we have more editors looking to make their mark in the industry.

- Oh yeah, my column series, "Keeping up with the Jones," took second place at TOCA for the third year in a row. I'll get 'em next year. But not if I keep writing bullet point columns like this one ... ☺

Email Jones at:  
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# Starter

NEWS, NOTES AND QUOTES



## //LOOKING FOR CHANGE




Former GCSAA president, Mark Jordan, was pleased with how a virtual National Golf Day meeting went with legislators from across the country.

## GOLF INDUSTRY PROFESSIONALS MEET WITH LEGISLATORS

At virtual National Golf Day, GSCAA members advocate for the game

BY GOLFDOM STAFF

 Golf Course Superintendents of America Association (GCSAA) members and other industry professionals met virtually with state legislators from across the country to discuss the Personal Health Investment Today (PHIT) Act, the Protect America's Children from Toxic Pesticides Act (PACTPA) and labor issues with H-2B Visas.

The PHIT Act would lower the cost of the activity and asks for use of pre-tax dollars in HSAs, FSAs and other medical accounts to pay for the prevention of disease. Included legislation covers youth and adult sports league

fees, sports and fitness equipment, tournament and green fees, required uniform fees and more.

During the meeting with Ohio legislators, the PHIT Act was the focus of conversations. Rep. Michael Turner (R-OH) has already pledged support.

"The day went really well, and I know our voices were heard collectively as an industry," says Mark Jordan, CGCS, past president of the GCSAA and Natural Resource Manager for Westfield in Westfield Center, Ohio. "It's always good to be there physically, this is our second year in a row virtually, but we thought it was productive.

*Continued on page 8*

## //NEW LEADERSHIP

### NICKLAUS COMPANIES APPOINTS PHIL COTTON AS CEO

Sports industry business leader Phil Cotton is taking over as CEO of Nicklaus Companies. He succeeds John Reese, who transitions to vice-chairman after being CEO for more than 10 years.

Cotton will oversee the existing businesses and teams of Nicklaus Brands, Nicklaus Design as well as all corporate relationships and new business opportunities.

"It is a huge honor to be leading the team at Nicklaus Companies. Jack has matched his on-course achievements with both his business and philanthropic endeavors and I am excited to have the opportunity to harness the great talent that we have within the business to continue to push the boundaries of what is possible and to ensure that the Nicklaus name remains synonymous with quality, excellence and innovation," Cotton said.

## //AN EASIER PATH TO FERTILIZING

### LEBANONTURF LAUNCHES COUNTRY CLUB IV

LebanonTurf has launched Country Club IV, a line of greens grade products with "increased visibility" that make fertilizer applications easier to see.

"In the tradition of listening to our superintendent customers, we're excited to bring these new products to our flagship golf course line of products," Christopher Gray, senior brand manager of professional fertilizers for LebanonTurf, said. "We believe these new products will dramatically help the superintendent make accurate and effective fertilizer applications on their high-quality putting greens."

Initially, the Country Club IV products will include the most historically popular analysis, 18-3-18, 18-9-18, 17-0-17 and 0-0-25. Additional product development will launch in the fall.

"We feel that our expanded portfolio of high-performing, greens grade products, both these new Country Club IV products and our incredibly popular Country Club MD products, offer today's superintendent a wide range of real-world benefits that fit into any putting green nutrient program," Gray said.

PHOTOS BY: GETTY IMAGES / ISTOCK-GETTY IMAGES PLUS / WELGLAD (GOLFBALL); ZIRPHOTO (U.S. CAPITOL)



## // TRAGEDY IN CALIFORNIA

# GOLF COURSE WORKER DIES IN HIT AND RUN

➔ Ismael Hernandez, a golf course worker in San Leandro, Calif., died after a hit-and-run driver rammed into his riding mower on a nearby street, California police reported.

"It makes me sick. It almost makes me rage," John Jorgensen, superintendent at Monarch Bay Golf Club, told *The Sacramento Bee*.

Hernandez died in the hospital on April 20 after being rear-ended by a stolen black Dodge Ram pickup truck on April 18, San Leandro police said in a news release.

Hernandez was returning a riding mower to the golf course maintenance shop via a bicycle lane. He is survived by three children and two grandchildren.

The driver of the pickup truck, whom witnesses say had earlier been driving recklessly in the area, drove off after the crash, police said.

Police later arrested a passenger in the truck on a warrant, leading to the arrest

of accused driver Jason McDermott, 43, of Oakland, the release said. He's been charged with vehicular manslaughter, hit-and-run and auto theft, according to reporting from FOX2 KTVU.

"It was so senseless for a man who's so gentle. He never, ever, ever had a frown on his face," Jorgensen said.

McDermott faces charges including negligent vehicular manslaughter, hit and run with injuries and other charges, police said. The golf course is mourning Hernandez's death.

"My cousin started a GoFundMe to help cover taking his remains to Mexico. Any money left over will go towards a savings account for his children and grandchildren," Felipe Hernandez, nephew of the victim, told *Golfdom*. "We appreciate the golf community so much for their generosity and kind words."

The GoFundMe brought in more than \$35,000.

## // FRIENDS OF GOLFDOM

# FITZGERALD ACHIEVES MASTER GREENKEEPER STATUS



It's a thrill to see our own Alan FitzGerald, CGCS, LedgeRock GC, Mohnton, Pa., on the stage at the British Turfgrass Management Exposition (BTME). Fitz was one of three industry professionals who earned the Master Greenskeeper (MG) designation from the British and International Golf Greenkeepers Association. FitzGerald was joined on stage by fellow newly appointed MGs Richard Johnstone and Greg Fitzmaurice and Sami Strutt, BIGGA COO.

FitzGerald, *Golfdom*'s 2019 Herb Graffis Businessperson of the Year award winner, is a regular columnist for the magazine. Whenever we edit Fitz's columns, we are sure to read them in our minds with an Irish accent.

## // GOLFING FOR A GREENER TOMORROW

# PROJECT EVERGREEN TO HOLD INAUGURAL GOLF CLASSIC IN AUGUST

Project EverGreen will hold its inaugural golf classic on Aug. 29, at the Lochmere Golf Club in Cary, N.C. According to Project EverGreen, the event's goal is to support the company's mission of creating a greener, healthier and cooler earth. *Golfdom* is a sponsor of the event.

"We are excited to combine the passion our volunteers and donors have for golf and the great outdoors with supporting Project EverGreen's mission to create a greener, healthier, cooler Earth," Cindy Code, executive director of Project EverGreen, said. "The work that is done to grow a healthier green space footprint through the GreenCare for Communities and GreenCare for Troops initiatives benefits communities and military families across the country."

The deadline to register is Aug. 22.

## // GOT THE NEED FOR SEED

# CENTRAL TURF ADDS TURF SEED CATEGORY DIRECTOR

Central Turf & Irrigation Supply appointed Austin Lanzarone as its new turf category director for seed. Lanzarone will focus on strategic growth for the seed category.

Lanzarone has nearly 20 years of experience in the green industry and a degree in plant and soil science from the University of Kentucky. His career has been heavily focused on the grass seed industry and includes experience with procurement, distribution, key account management and sales.

"We couldn't be more excited to have Austin join our team. With the rapid growth of our turf division, it's critical for us to have an industry leader like Austin to focus on and execute category-specific strategies for the department," Anthony Luciano, vice president of sales and marketing for Central Turf & Irrigation Supply, said.

Lanzarone's addition to the team is part of Central's overall growth goal for the turf division and is the department's first dedicated category director position. Additional hires will also be joining Lanzarone as category directors for fertilizer and chemicals in the coming months.



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**// WINNER, WINNER**

## Golfdom wins 13 industry awards



**→** Golfdom took home 13 awards as part of the 2022 Turf and Ornamental Communicators Association's (TOCA) Awards Contest. Winners include:  
**Gardner (Best-in-Show) Award**  
**Best single photo** – 21 at last, Pete Seltzer

**First Place**  
**Best print magazine cover** – 21 at last, Pete Seltzer

**Best single photo** – 21 at last, Pete Seltzer

**Portrait/personality photo** – Minny Makeover, Jamey Guy, Pete Seltzer

**Turf feature article** – Grass is Greener, Christina Herrick

**Product information article** – Viva Las Vegas, Seth Jones, Christina Herrick and staff

**Special projects** – Superintendent

Bingo, Seth Jones, Pete Seltzer, Craig MacGregor

### Merit

**Best print magazine cover** – Behind the beauty, October 2021, Pete Seltzer

**Two-plus page design** – How quickly things can change, Pete Seltzer

**General feature article** – Hooked, Matt Neff

**Series of columns by regular columnist** – Keeping up with the Jones, Seth Jones

**Best instructional video** – USGA's Brian Whitlark on the growth of soil moisture meters in golf, Seth Jones, Joey Ciccolini

**Best long video** – Learn how Field of Dreams team prepared the turf for MLB debut, Seth Jones, Joey Ciccolini.

*Continued from page 6*

"Mental and physical wellness and creating that environment for golfers is a huge part of what we do, so that's why we're supporting (PHIT)," Jordan adds. "Also, it's a chance to introduce new people to the game of golf."

The PACTPA Act would ban pesticide products banned or otherwise prohibited by the European Union (EU), one or more countries in the EU or Canada. The GCSAA supports H.R. 7266, a bill sponsored by U.S. Congressman Rodney Davis (R-Ill.), which protects state pesticide preemption.

"We are supporting H.R. 7266," Jordan says. "Really, it protects that state preemption and we feel very strongly about it. The (PACTPA Act) is about preemption, and being able to let any municipality set up these pesticide bans. H.R. 7266 would prevent that from happening."

The H-2B Returning Worker Exemption Act would permanently exempt workers who were previously admitted to and worked in the U.S. on an H-2B visa during the past three fiscal years from the annual 66,000 visa cap.

"We really would like to have more H-2B workers," Jordan says. "We'd like to promote these changes and expand opportunities to get more of these workers out there."

According to the GCSAA, over 200 golf course industry professionals attended the meetings on May 11.





## #TurfTweetoftheMonth

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**Joe Berggren**

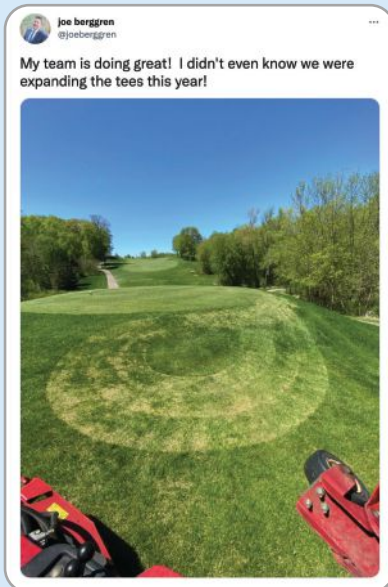
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### // GOING SEEDLESS

## TWO NEW BERMUDAGRASSES

Mississippi State University (MSU) scientists developed two new turfgrass cultivars as the first hybrid bermudagrass cultivars unrelated to the commonly used bermudagrass 328 (Tifgreen).

"The superior performance of these two grasses provides stakeholders with new options in the putting green market," Hongxu Dong, assistant professor at MSU who specializes in turfgrass breeding and genetics, said. "These two grasses are adding novel genetic diversity to the bermudagrass cultivars, especially to the ones used on putting greens."

The two types of grass, "MSB-264" and "MSB-285," have a more upright leaf orientation than traditional bermudagrass putting green cultivars. While these are visually similar, MSU said they have different genetic compositions. Both are propagated vegetatively and are sterile triploid genotypes, meaning that they do not produce seeds.

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# Starter



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As a self-certified *Golfdom* archives surfer, I was immediately drawn to the cover reprinted in the March 2022 issue. With all the research I do, acronyms are sometimes difficult to figure out if they are not spelled out first.

The NRA mentioned in the photo caption should read the National Recovery Administration. (*Editor's note: We incorrectly identified the NRA logo as the National Rifle Association's logo in that issue.*)

For full disclosure, I always thought the NRA stood for National Recovery Act but, in fact, the NIRA — National Industrial Recovery Act — was the act that enabled the NRA to be an administration. The NRA acronym can be as confusing as the WWF was until they agreed to change to the WWE.

My fact-checking habit is the result of lessons learned as a second grader. Our school librarian started the "We Never Guess, We Look It Up Club," of which there was no acronym, but we all got a nifty lapel pin. I'm going to assume I became her most fervent disciple.

Keep up the great work with your magazine. I always enjoy the reprinted archives feature every issue.

Far and Sure,

**Doug Vogel, CGMAS**  
Certified *Golfdom* magazine archives surfer and superintendent, County of Passaic Parks & Recreation Department, Wayne, N.J.

Karl,  
I would like to thank you for the nice article regarding the Michigan Turfgrass Foundation and its recent decision to pledge and our initiative to the Vargas Endowed Chair ("A high honor for Turf," March 2022).

It was well written, comprehensive and thoughtful of the purpose we are undertaking.

I am well aware of your history at Michigan State University and elsewhere (I read all your articles in *Golfdom*) and we appreciate your time that you put into preparing the article.

You may not recall any of our conversations — or who I am — but as an MSU Grad, course superintendent, club manager and now Executive Director of the Michigan Turfgrass Foundation, it has been my pleasure to be involved with so many classy individuals.

Thank you again for your support!

**Carey Mitchelson**  
Executive director, Michigan Turfgrass Foundation

Seth,  
I just wanted to say how spot-on your column titled, "Canceled no more" (March 2022) in the new issue of *Golfdom* is. I went to the GCSAA Conference and Show and found it an excellent event. First of all, California seemed no more "locked down" than my state. Showing proof of vaccination was easy (and comforting) and mask wearing indoors was lightly enforced. The education was excellent as always and the trade show still seemed as big to me, just less crowded, which selfishly was fine as it allowed me to move about easier.

Many folks I spoke with when I returned home would say "I heard the show wasn't that good." My reply was it was just as "good" as always, maybe not as well attended, but it didn't hurt my enjoyment with having less of a crowd. I think GCSAA deserves a lot of credit for making it work. The opening session on the Midway was maskless as well the closing ceremony.

(Name withheld by request)

# Golfdom Gallery



**1 Championship parade** Hunki Yun (left), USA's director of partnerships, outreach and education, happened to be visiting Lawrence, Kan., on the same day as the Kansas Jayhawks national championship parade. *Golfdom* Editor-in-Chief Seth Jones (right) saved him a good spot right on Massachusetts Street.



**2 NFL's loudest stadium** PBI-Gordon, based in Shawnee, Kan., was on their home turf for the 2022 Turf and Ornamental Communicators Association (TOCA) annual meeting in Kansas City. From left to right are Gabby Leon, Joe Sallustio, Callie Zevecke and Abbey Barry photographed at Arrowhead Stadium, home of the Kansas City Chiefs.



**3 So many Jayhawks** We'll admit, Jones is insufferable around the office now that the Jayhawks won the 2022 National Championship. Seth, we don't care anymore! Photographed in his garage-turned-sports-bar are (left to right) *Golfdom* Publisher Craig MacGregor, Group Publisher Bill Roddy, Editor Christina Herrick and Jones.



**4 Pickleball champions** (Left to right) Kris Guy and Amanda Baldwin, both of Hunter Industries, and Herrick all took home pickleball trophies. Who knew Herrick had such a devastating backhand?

**5 Epic fun** Cheering on the TOCA pickleball tournament were Roddy with Jacy Glazier of Wisconsin-based Epic Creative.



**6 Let's call it a tie** Before things got out of hand, these guys decided to call their double's pickleball match a tie. From left to right, Scott Covelli, Epic Creative; proud Mizzou alumnus Sam Wineinger, Sipcam Agro USA; MacGregor and PBI-Gordon's Sallustio. Don't worry, guys, we know who had the lead at the end.





# The Golfdom

## FILES

FROM THE ARCHIVE

## A \$16K maintenance budget

BY THE GOLFDOM STAFF

**G**olfdom's September 1927 issue looks at the tug and pull between superintendents and greens committees when setting maintenance estimates.

"Because the average greens committee does not know the amount of work required to keep a golf course in good condition, most of the estimates of annual maintenance costs are too low," the author, who uses the nom de plume "Mac," writes.

While the numbers may have changed between 1927 to today, the need to look at how the course plans to spend its money on labor, machinery and inputs haven't.

"I have seen a case where \$23,000 has been spent on upkeep that I would consider expensive at \$5,000," the author writes. "In my opinion, a good greenkeeper can keep an 18-hole course of good design in first-class condition on a budget from \$16,000 to \$18,000 a year, barring extra work that is really a capital expense."

Modern machinery such as compost mixers helped the author reduce the amount of labor needed on the course.

"When a lot of greens committees realize that they can spend for up-to-date equipment and stand a very good chance of quickly saving its cost in reduction of labor charges, the greenkeepers' work is going to be easier and better," the author writes.

Here is what the author considered a reasonable budget:

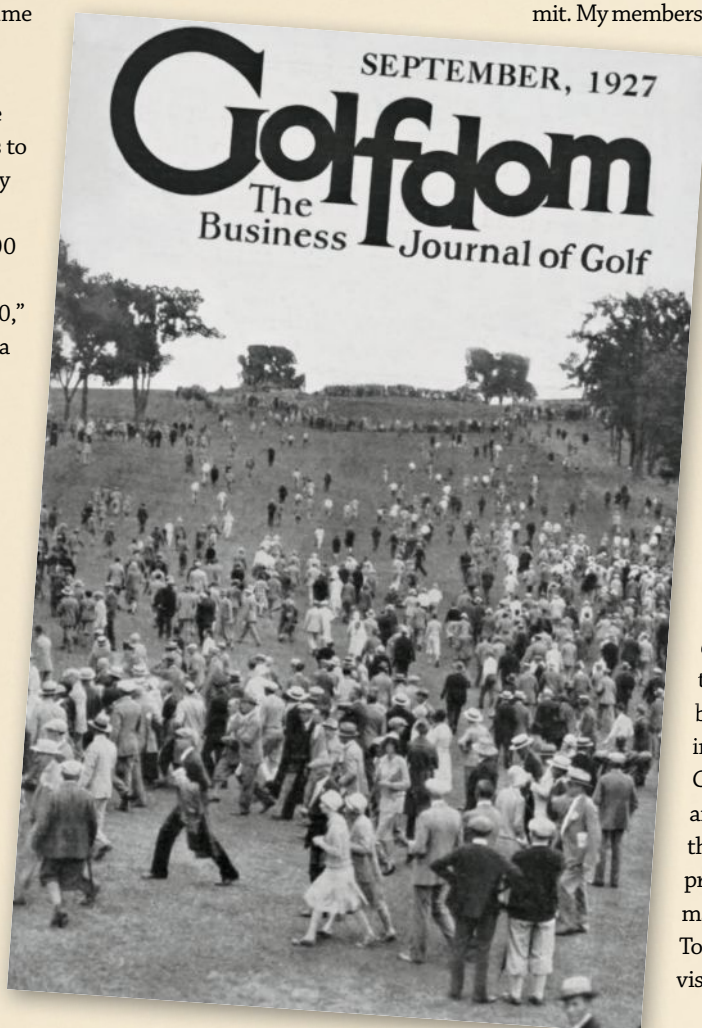
- Labor: \$11,500
- Sand, gas, oil, repairs, etc.: \$2,500
- Machinery: \$1,500
- Seed and fertilizer: \$1,000
- Weeding: \$1,000

"I have been connected with four clubs in this country since coming from Scotland. Not any of them have spent more

than \$16,000 a year for upkeep, and their courses were kept in good shape," Mac states. "My course right now is one of the best in the district (the south central), and my budget is \$15,750 a year. This is my first season at my club. The course was not in the best condition when I took it over, and there are still a few things that need improving, but they will have to be worked up gradually as time and the budget permit. My members say they have never saw

the course looking so good and so well trimmed up, and visitors from some of the country's foremost courses compliment its condition, so I have every reason to believe that my budget is a reasonable one."

Other articles in the issue include "Black Hawk's green making and maintenance methods," by J.S. Bone, the superintendent of the Madison, Wis., course; "Unconsidered trifles of a golf course," by Fred Sherwood, superintendent at Northmoor CC in the Chicagoland and "They found where they stood — and raised prices," by H.J. Reinoll, manager of San Diego CC. To read the entire issue, visit [Golfdom.com](http://Golfdom.com). ©





"When I led my young staff, I tried to let them have fun. I was a semi-loose leader. I like to laugh and you gotta be able to laugh at yourself."

**MATT SHAFFER**, *director of golf course operations emeritus Merion Golf Course, Ardmore, Pa.*

## Don't try this at home

**I** love *Golfdom*! I like the short, fast articles. After all, as a super, you never have enough time. When Seth asked if I would like to submit a semi-regular column for the magazine, I thought, "Wow, what a monumental privilege ... heck yeah!!!"

As in my professional life, I will not be dazzling you with technical agronomic tips but instead sharing down-home practices for firm, fast greens, and growing grass with less chemistry and water. But most importantly, I'll be sharing funny memories of some great golf course experiences.

When I led my young staff, I tried to let them have fun. I was a semi-loose leader. I like to laugh and you gotta be able to laugh at yourself. Even more important? Let them laugh at you. If you can foster this type of environment, you come away with some great memories.

I asked Seth what his idea was for this column, and he asked if I would share my top three funniest stories from the course. I'm sorry, Seth,

but if I work hard, I could get it to maybe 25! So, stay tuned, and we should have some fun!

### The after-hours assistant

When I was an assistant at Augusta National, the interns lived off-property in an apartment across the fence behind hole No. 5; that is all gone now. They would blow off steam and have some wild parties. Ironically, Paul (Latshaw) would lecture me on being an assistant after-hours ... I failed miserably at that assignment.

One night, the interns were playing poker and partying. I left as everyone seemed to be fading. We had an intern that would fall asleep with his eyes open — it was very freaky. He also had an impressive mustache

and eyebrows you could stand on.

The next morning, he comes strolling in mad as a hornet because when he passed out, they shaved off half his mustache and his opposite eyebrow. I asked him, "WHY didn't you shave the rest of your 'stache off?" He replied, "I want Mr. Latshaw to see this!"

Paul walks in, and he isn't happy! He looks right at me and says, "What happened?!" I have no idea what came over me, but I started to laugh, and so did 50 other guys in the breakroom. Paul turned, walked out and said, "Mr. Shaffer, NOW!"

I walked into his office, and he said, "Shut the door!" Paul then turned in his chair and laughed until he cried and said, "Those kids are nuts!"

### Another quick Augusta story

Way back in the day, Augusta had an upper and a lower shop. The lower shop was the big shop — to the left of No. 4. There was a very small bathroom with a tiny window. Often, I walked past the shop and heard a loud bang, like an explosion. I was always in a hurry and busy, so I never thought much about it.

One day Mother Nature called, and I hurried over to the lower shop. All of a sudden, a balloon comes through the window hanging there. Oddly, it had a lit fuse sticking out of it?!?

Just when I started to comprehend what might be happening, BAM! It explodes! The mechanic, Tommy Billiter (who was a full-blown character), had come up with this little initiation for new employees: a balloon blown up with just a touch of acetylene. I tried to look composed when I came out, only to see guys laughing. Later on, I'd see guys come running out with their pants around their ankles.

Did I mention it was 1986? Orientations nowadays are a bit more structured.

Remember, the best release from stress is laughter! ☺

**Matt Shaffer**, a longtime superintendent, is the owner of Minimalistic Agronomic Techniques (M.A.T.) He was previously the superintendent at The Country Club in Cleveland and is director of golf course operations emeritus at Merion GC, Ardmore, Pa., where he hosted the 2013 U.S. Open. Reach him at [matthewgshaffer@gmail.com](mailto:matthewgshaffer@gmail.com).



## INNOVATE. RESEARCH. DELIVER.

# Setting up a strong course

### How The Golf Club at Lansdowne maintains course integrity using fungicides from Syngenta

Over the last 12 years, Marc J. Muniz has been heavily entwined in the golf course industry.

While he intended to work just summers at Ridgewood Country Club, he found his calling and decided to pursue a career in turf. When he graduated from the University of

Massachusetts, Muniz asked a professor what area of the U.S. had the most difficult time growing cool-season turf because that's what he wanted to master. The professor told him some of the most difficult turf to manage in the mid-Atlantic are cool-season and warm-season turf, so he made its mastery his goal.

When Muniz began at The Golf Club at Lansdowne in Virginia, he noticed a plethora of Syngenta products available in the chemical shed. Admittedly, he said he was not familiar with the company's products and usage, but he had seen them in action on a peer's course and wanted to try them at The Golf Club.

Shortly after starting at The Golf Club, golfers started to complain about dollar spot patches on one of the greens. After some trial and error, Muniz found a winning solution: Posterity® XT from Syngenta.



**Marc Muniz**

"When I first got here, we had a bit of an issue with dollar spot very early in the season, actually in the middle of April. We did a generic application, and three days later the dollar spot was breaking through again," Muniz says. "After researching more, we suspected we had some DMI resistance. We knew we needed to revamp the program. We took all the other DMI products out except for Posterity XT and found that worked very well. We used 3 ounces for 21 days and had no dollar spot on any of the fairways."

Muniz says he relies heavily on Posterity XT for many different turf diseases, including brown spot, dollar spot, fairy ring and spring dead spot.

"The versatility of Posterity XT is outstanding because it covers so many different diseases," he says. "It's something I'm leaning on to cover a lot of different things. I feel like I could spray it whenever and get control over most things during any season."

A while later, fairy ring became a larger problem for The Golf Club. Muniz reached out to his Syngenta territory manager, Sam Camuso, for advice. He recommended using Posterity XT to treat fairy ring patches. After gaining control, Muniz enrolled in the GreenTrust® 365 Fairy Ring Assurance program to ensure complete coverage year-round.

After the success he experienced with

***It's truly unmatched. With the combination of the three chemistries in it, you can really rely on it to cover any diseases. And with how it's applied, watering it in or leaving it up top, you're covering a lot of bases."***

— MARC MUNIZ



See what Paul Koch, Ph.D. has to say about Posterity XT in less than 2 minutes.

Posterity XT, Muniz wanted to continue with Syngenta products whenever he could. Camuso recommended he try Posterity Forte as well, and Muniz was hooked. Now, he relies on Posterity Forte to handle severe dollar spot, and Posterity XT for overall patch disease control.

"I felt so confident with Posterity XT that I made sure we had other Syngenta products including Posterity Forte since I was so impressed," Muniz says. "There are areas where the tee plaque covers were creating dollar spot, which showed the difference between the greens without Posterity products and those with. It was outstanding."

As Muniz maintains both warm- and cool-season turf, he found using Posterity Forte and Posterity XT gives him the protection he needs, while keeping the integrity of his course intact.

"I would say my favorite thing about using Posterity is the versatility of the product," he explains. "It's truly unmatched. With the combination of the three chemistries in it, you can really rely on it to cover any diseases. And with how it's applied, watering it in or leaving it up top, you're covering a lot of bases."

Between the products from Syngenta and the constant guidance from Syngenta experts, Muniz says Syngenta's portfolio makes the most sense to use at The Golf Club. After his promotion to director of

agronomy, he saw the system in place and how much the course relied on Syngenta products.

"I've been happy with Syngenta since I got here, and I've been very pleased with Syngenta's support as I transitioned into director of agronomy," says Muniz. "There was an exchange of products and some other things like that, but Syngenta created a great support system for us. It's been an amazing relationship. From the versatility of the Posterity products to the contact I can have with our rep, I am constantly impressed with Syngenta."

Learn more at [GreenCastOnline.com](https://www.GreenCastOnline.com)  
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# TECHNOLOGY & AGRONOMY

Experts advised us on recent advancements that we should pay attention to — and we sought to learn more

»» BY ROB DIFRANCO

Old habits die hard in the golf course maintenance industry. But with the golf boom over the last few years, some of those old habits will have to be on the chopping block soon in order to keep up.

Luckily, there are hundreds of new technologies in the market that can help make the job of a golf course superintendent easier.

On the other hand, it's a crowded technology space, especially in this industry.

To help you sift through the tall grass, we asked several friends of the magazine to reveal what they believe are the next game-changing technologies in golf course maintenance.

We took their advice and sought to learn more. Here's what we found.

## Track and store data

Gerald Flaherty, superintendent of The Valley Club in Sun Valley, Idaho, recalls a time when he could have used his taskTracker software. Flaherty faced budget cuts in 2008 and had to defend his budget.

"They went and cut it right down the line. I didn't have any defense on that," he says.

At its base, taskTracker allows users to create, share and store job boards. Flaherty and Jaime Sharp, director of golf

at The Valley Club, designed the system in 2013 to make Flaherty's job easier by helping him collect data on his crew's activity.

That hasn't changed since taskTracker's launch. The program still allows users to create and edit boards from any internet-connected device.

Facing a similar situation as 2008 at the start of the COVID-



Gerald Flaherty

19 pandemic, Flaherty presented real numbers on how much cutting certain services would cost. He says he shared how much not raking bunkers on the weekends and mowing the greens one less day a week would save.

The result? The course didn't cut his budget.

"I put it on them this time," Flaherty says.

Recently, taskTracker started moving toward equipment tracking. A new feature added in 2022 allows superintendents to track how much gas they use. Crew members scan QR codes on equipment and input how much gas they put in the tank.

Flaherty says the recent rise in gas prices inspired that change, although superintendents have requested it for a while.

*Continued on page 18*

## MEET THE EXPERTS

*Thank you to these friends of Golfdom for their recommendations:*

- **Thad Thompson**, superintendent, Terry Hills GC, Batavia, N.Y. (SIP Grinders)
- **Shawn Emerson**, agronomy consultant, Ethos Club and Leisure (OnLink)
- **Clark Throssell, Ph.D.**, former *Golfdom* research editor (Cirrus PRO)
- **Andy Eick**, director of facilities and agronomy, Mohawk Golf Club, Schenectady, N.Y. (taskTracker)
- **Tyler Andersen**, superintendent, University of Texas Golf Club, Austin (Visage Fleet Management system)
- **Ben McGraw, Ph.D.**, Penn State University (Suprado)



“(Novaluron) has never been labeled for turf. That’s significant because there’s a growing resistance to additional chemistries in some ABW populations.”

*Continued from page 17*

“Now we have a whole section on there for our equipment,” says Flaherty. “So, if you want to change the oil on something every 300 hours, it knows that piece of equipment has been out for 300 hours, and it’s going to send the mechanic a work order reminder saying you need to bring that piece of equipment in.”

The system also allows for tracking of course measurements, like green speeds, clipping yields and moisture content.

### Taking the fight to ABWs

Ian Rodriguez, Ph.D., technical services manager for Quali-Pro, has appeared plenty of times in this magazine, spreading the gospel of Quali-Pro’s Suprado insecticide.



**Ian Rodriguez**

Suprado, an insect growth regulator (IGR), targets the annual bluegrass weevil (ABW) at several stages of its life cycle. But most notably, it inhibits an adult ABW’s ability to lay eggs instead of killing them directly.

The active ingredient in Suprado, novaluron, is a new name to not only the golf course industry but to ABWs too.

“(Novaluron) has never been labeled for turf. That’s significant because there’s a growing resistance to additional chemistries in some ABW populations,” says Rodriguez.

Suprado is still undergoing testing as Quali-Pro looks to answer questions such as, ‘Can you wait until the following day to water it in?’ Rodriguez also says it’s being tested on a number of other turf pests as well.

During testing on ABWs, Suprado provided what Rodriguez called excellent levels of control against medium-sized ABW larva. According to Rodriguez and Ben McGraw, Ph.D., who conducted three seasons of Quali-Pro’s testing on ABW, they achieved 95 to 100 percent control of a population that McGraw said he “would be happy with seeing around 50 percent control.”

Rodriguez hopes to see similar results on other turf pests as testing continues.

### All at your fingertips

John Deere began working alongside OnLink in 2017; two years later, they purchased the management software and, in the years since, they’ve added several new features.

David Anderson, product manager for John Deere, spoke with *Golfdom* about the software and how it makes superintendents’ jobs easier from the equipment and labor side.

“On the equipment side, you can keep up with recommended services. We’ve got recommended service intervals, labor and parts so the equipment manager (or superintendent) can know what to do and when and be ready for those

*Continued on page 35*

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# FOCUS ON FUNGICIDES

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## // A Word From Our Sponsor

# Control of spring dead spot with one application? Why Kabuto is the top single-application performer.

By Brian Aynardi, Ph.D.

In 2022, there is no excuse to have spring dead spot on your golf course if your budget allows you to spray a fungicide. We'll get to the specifics shortly, but first a little background.

Spring dead spot is a chronic and problematic disease that affects bermudagrass (and zoysiagrass) where winter dormancy occurs. And spring dead spot may be just as severe for those who cover bermudagrass greens.

There are two species of *Ophiosphaerella* that cause spring dead spot: *O. korrae* and *O. herpotricha*. Recent

work from Virginia Tech University explained many etiological factors surrounding spring dead spot. For

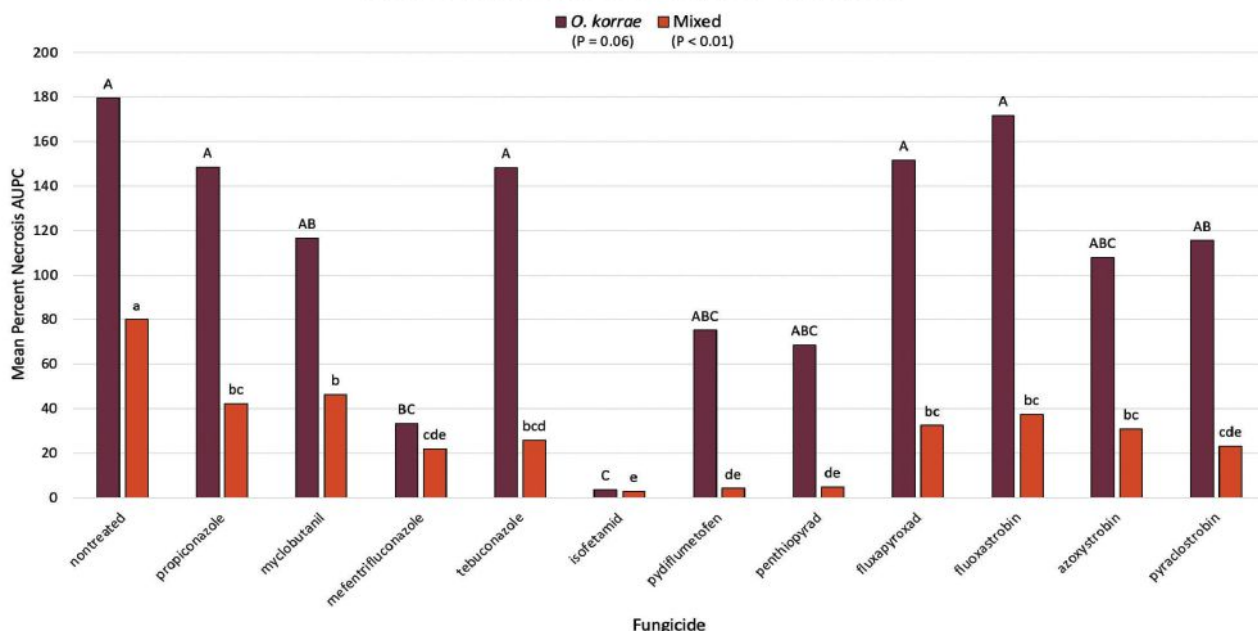


Brian Aynardi

instance, drier weather in the fall resulting in drier soil/thatch equates to more severe spring dead spot the following spring. Those of you in the southeast likely validated this finding when you noticed a lack of spring dead spot in the spring of 2021 after a very wet fall in 2020, contrasted with severe

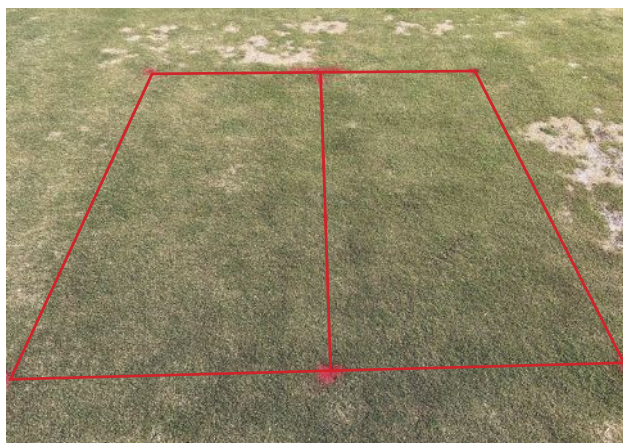
Continued on page FS4

Mean Percent Necrosis AUPC Compared within Species





# FOCUS ON FUNGICIDES



**Kabuto controlling spring dead spot at N.C. State University with one application at 3.2 fl. oz./1,000 (left) and two applications at 1.6 fl. oz./1,000 (right). Non-treated areas to right and above highlighted areas. Photo taken April 20, 2022.**

*Continued from page FS3*

spring dead spot this spring after a rather dry fall of 2021.

The Virginia Tech study also demonstrates the active ingredient in Kabuto® Fungicide SC, isofetamid, is extremely effective in controlling *both* of the aforementioned *Ophiosphaerella* species. While not always significantly different from the other active ingredients (speaking in statistical terms), take a look at the numerical data. There's a striking difference in the minimal amount of disease observed when Kabuto is used (see figure on page FS2 from Virginia Tech, originally published in *Golfdom's* 2021 *Focus on Fungicides*). With that level of control against both species, why would one not consider using Kabuto?

Now to the part that likely piqued your attention: industry-leading control of spring dead spot with *one* application.

By now, many of you have been well-trained to make an initial application for spring dead spot when soil temperatures at two inches drop below 70-75 degrees F in the fall for five consecutive days, with a sequential application three to five weeks later. Sure, the sequential application methodology is sound, especially when

turfgrass managers were relinquished to using less than reliable fungicides for a number of years, and optimal timing of fungicides based on pathogen growth was not entirely clear. With advancements in our understanding of pathogen biology and fungicide application timings, there is an easier way to control spring dead spot; a method that results in less labor, less fuel to run the sprayer, less post-application irrigation events, and less monitoring of environmental conditions. The solution: make a single application of Kabuto and be done with it.

PBI-Gordon has conducted research trials with private industry cooperators and our academic partners at North Carolina State, Virginia Tech, Tennessee, Clemson and others, and the results have proven (for more than six years) that a single application of Kabuto at 3.2 fl. oz./1,000 sq. ft. consistently provides outstanding disease control with >90 percent control observed in many trials. That's all but guaranteed control in the world of spring dead spot prevention. Think about the savings from only making one application as opposed to two. With the various inflationary factors that will influence capabilities at golf courses this year, don't allow rising costs affect your ability to control spring dead spot; choose the one (or two) application solution from PBI-Gordon to keep spring dead spot away. Contact your distributor about Kabuto today!

**Brian Aynardi, Ph.D.**, is the Northeast research scientist for PBI-Gordon. Aynardi is a turfgrass pathologist and has conducted numerous research projects on the management and control of anthracnose, along with many other diseases. You may reach him at [baynardi@pbigordon.com](mailto:baynardi@pbigordon.com) for more information.



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// **A work of art**

## Creating art with grass

South Carolina superintendent overcomes  
'Petri dish for spring dead spot' to create  
a lakeside beauty for members

By **Seth Jones**

**T**y Roberts didn't just want to play golf; he wanted to be a part of it.

When his competitive golfing days ended, there was a decision to be made. How could he stay in golf if he wasn't going to be on the high school golf team? He loved being outside and he needed a job. The answer was easy: heading to Horry-Georgetown Technical College in Myrtle Beach, S.C., to study turf.

"I knew I wanted to be a part of the game so I ended up working on golf courses," he says. "I loved it and decided that is what I wanted to do. When you start something and finish it and you get to see how much it's improved? In an instant, you get that awesome feeling."

For the past four seasons, Roberts has been getting that reward of seeing a course improve at Keowee Springs Golf Course, Six Mile, S.C. Keowee Springs, part of the Cliffs family of golf courses in South Carolina and North Carolina, is near Clemson University and next to beautiful Lake Keowee. One of two

Tom Fazio designs in the Cliffs group of courses, Keowee Springs is known as a fun, family-friendly course. Families can come in off the lake and play a 6-hole, 12-hole or 18-hole loop and then get back on the water. There are six different sets of tees and a short course within the 18. Snack shacks after No. 6 and No. 12 add to the laid-back atmosphere the lakeside course strives for.

However, don't confuse a laid-back atmosphere with laid-back expectations for excellent conditions at this private club. Members expect fast and firm greens and often compare Keowee Springs with its surrounding courses. That's to be expected anywhere, but Keowee Springs is bringing bentgrass greens to the competition, while many of the surrounding courses have switched to ultradwarf bermudagrass greens. Roberts says those courses are offering up gnarly, undulating, fast greens at the same time he is in survival mode.

The course has installed 35 fans, two fans each on most greens, to help the

cause. Roberts also says he relies on a good chemical program, watching his nutrients closely and being a big believer in fungicides. He tries his best not to put the plant under too much stress and damage it.

"It's a challenge, everything from nutrients, the fungicide program, your water, airflow, to just scheduling guys to be out there babysitting greens," he says. "Then there's a lot of electrical work that goes on behind-the-scenes to keep fans going. All of that is the most challenging part of the job."

### **Nifty little program**

As beautiful as the course and its surroundings are, it's also a paradise for the conditions that create spring dead spot. It's close to the lake, close enough to create high humidity but not close enough to provide airflow. Tall pines surround the course. Temperatures regularly rise above 95.

Roberts says he'd never seen spring dead spot outbreaks like when he arrived at Keowee Springs four years ago.

"It was as bad as it gets. I never saw this much spring dead spot, even when I worked out on the coast," Roberts says. "What the hell do you do? You just throw stuff at it; you go back to all the things that you know, have tried and seen done. And then you go out on a limb and try some things that no one's trying."

Thankfully, his recipe for spring dead spot, which includes Kabuto as its linchpin, has proven effective.

"This place is a Petri dish for spring dead spot," Roberts says. "I can look back at the spray logs and see what they were doing previously because if it's not working, there's no point in me sticking to it. We changed a few things, the most relevant being adding in Kabuto, and we've had awesome success ever since.

"We've got a little program in place now where we're getting pretty much 100-percent control," Roberts continues. "We're looking at it as we're getting 95- to 100-percent control now. When I say 95 percent, it's because there's a process where the Bermuda is coming out of dormancy, and it's greening up, but it's not yet consistent. So it kind of hides. Before members play, before they even take notice of it, you've already grown out of it."

The test this spring was especially challenging, Roberts adds.

"We were so late warming up; our spring lasted so long," he says. "We were sitting there within those soil temperatures where we were under the spring dead spot umbrella. We need to have cover out there, but as expensive as it is, to blow those applications out there — especially when you're treating 90 acres — you really are taking a gamble. But it's been effective. It's proven here because when I say (spring dead spot) was severe here, I mean it."

## Meant to be beautiful

Brett Rieck, sales manager, PBI-Gordon, calls the course 'an incredible piece of property,' and says Roberts and his crew have done a tremendous job overcoming the course's disease pressures. Rieck visited the course in February to meet with Roberts and his team.

"What Ty has been through the last several years, I can't believe how he has turned it around," he says. "It was devastating, it wasn't just a place here and there.




Ty Roberts, superintendent, Keowee Springs Golf Course in Six Mile, S.C., saw nearly 100 percent control of spring dead spot thanks to his program which includes Kabuto.



Roberts (center) with Florentino Antonio, foreman (far left); Chris Adler, head equipment technician (left); Cole Adcock, assistant superintendent (right) and Justin Britt, assistant superintendent (far right).

If you took an overhead view, it was like someone dropped the spring dead spot bomb on them. They've been fighting with this crazy disease, bouncing around with this product and that product. Ty went all-in with Kabuto and finally, after many years, got it all cleaned up."

Now that Keowee Springs has gone from that 'Petri dish of spring dead spot' to a course that competes with its neighbors, Roberts says he can again focus on the art of being a superintendent.

"Golf courses are meant to be beautiful," Roberts says. "It's like creating art with grass. I like to think about the design, and how much was put into it by the architect that he knew a person would play that shot. It's a fun place, you just really have to deliver aesthetically. It needs to look good here in the spring. Spring dead spot impacts playability, but aesthetics here are extremely important, and (spring dead spot) is about the ugliest disease out there." 



// Formulated to last

## Here to stay

Modern fungicides are formulated to stay in the top two inches of the root zone, but timing and irrigation are vital

By Jonathan Delozier

**W**hen looking to stamp out root zone pathogens like spring dead spot, some turf professionals worry about overwatering after applying a fungicide.

These products come at a price. What's the point of buying a premium product only to misapply it? It's like watching your friend ask for a bottle of ketchup after the \$90 steak is set in front of him.

Industry experts say in the case of overwatering a fungicide application, the fear of drowning out the product is unfounded. That's because companies formulate modern products like Kabuto® Fungicide SC to avoid sinking too low into the soil and past the area meant for treatment.

"This is something we worked on for many years," says Jim Kerns, Ph.D., professor and Extension specialist, North Carolina State University, department of entomology and plant pathology. "With fungicides, only a very small group of

them move down into the plant. Every other fungicide stays on the leaf or root surface or moves laterally across the leaf or root. Sometimes, they're translocated



**Jim Kerns**

upwards. So, what we started focusing on is that with a lot of root diseases from spring dead spot, *Pythium* root rot, they're all affecting the roots, so the question became, 'How do we get the fungicide to where it needs to be?'"

### Water immediately

According to Kerns, spring dead spot symptoms appear in circular patches from six inches to several feet in diameter that remain dormant as turf greens up in the spring. These patches eventually die and collapse on the soil surface. Affected areas recur in the same spot each year and increase in size by up to several inches each season.

Intensely managed bermudagrass,

such as golf courses and athletic fields, are prime spots for spring dead spot to manifest. Unlike take-all patch, spring dead spot does not decline in severity as the turf matures and becomes more severe if left unmanaged.

The spring dead spot fungus attacks the roots, rhizomes and stolons of bermudagrass during the fall and winter. This activity does not directly kill the plant but instead makes the bermudagrass more susceptible to freezing injury. As a result, spring dead spot is most severe in the northern range and is usually more severe after extremely cold winters, according to research conducted by Kerns and colleagues.

Modern fungicides like Kabuto have come to the forefront to combat this nemesis of superintendents. University research continues to monitor the effectiveness of these fungicides and the nuances of properly applying them.

Kerns says two general keys to success when applying Kabuto are to not worry about the amount of irrigation but do be sure to be timely with the water.

"To put it simply, it's very, very hard to overwater with something like Kabuto and root zone pathogens," he says. "But you need to get that irrigation done as soon as possible to make sure the (fungicide) is getting deep enough into the ground."



Brian Aynardi, Ph.D., Northeast research scientist at PBI-Gordon, agrees with Kerns. He adds that feedback from Kabuto users in their battles against spring dead spot remains glowing.

"I like to say that the only time Kabuto doesn't work great on spring dead spot is when you don't water it in," he says. "Essentially, that's where you need to get the fungicide. What I tend to tell people is, 'You're spending a decent amount of money on your fungicide. We're not talking \$30 per acre applications here.' If you're going to spend to get something of high quality, like Kabuto, you need to water immediately. If it's important enough for you to go

**Quick irrigation after a fungicide application is vital to get the most out of the treatment. Don't let day turn to night, experts advise. Irrigate within six hours of fungicide application to avoid the product bonding to organic matter or being absorbed by plants at the surface level.**

the extra mile for a better product, just water it right away."

### **Stays on top**

Aynardi urges users to begin their post-application irrigation as soon as possible. He recommends irrigation within six hours of putting the fungicide down to avoid the product bonding to organic matter or being absorbed by plants at the surface level.

"You're not going to water Segway or Kabuto through the root zone," he says. "You're just not. It's almost bet-

ter to put more water down with those products because the product isn't going past the root zone. Most of it is going to stay within that top inch to two inches, and it's not going to go past four inches.

"With turf, I can think of one or two fungicides, not from (PBI-Gordon) that might get watered below the 4-inch mark," Aynardi continues. "It will vary a bit depending on organic matter that's present and maybe if it's soil that's sand-based or more of a heavier soil with clay.

*Continued on page FS10*



# FOCUS ON FUNGICIDES

*Continued from page FS9*

Even then, there's so much organic matter with turf that Kabuto isn't going to move too far down."

Kerns says he saw a course with a "solid" fungicide program that struggled with diseases in certain areas. Implementing adjustments in irrigation patterns immediately helped the course see better results.

"I looked at their program and thought, 'There shouldn't be a disease,'" he says. "But none of those materials were being watered in.

Things turned around immediately after that adjustment."

Kerns says recent research, along with the phasing out of older products, makes the overwatering concern a thing of the past.

"Some older products were more mobile in the soil. That's part of the reason they were removed from the marketplace," he says. "With research from four or five years ago, we were worried about resistance in the pathogens starting to develop. It turned out that, basically, we had to increase the water to make

sure the (fungicide) was getting where it needed to be."

## Know your product

A product's organic carbon partition coefficient rating (Koc) is one of the better ways to anticipate its ability to travel through soil or stay at a desired depth, says Aynardi.

He points to Kabuto's rating of 489 as an ideal measurement to ensure it gets to the necessary depths while also not going too low.

"You don't want too low of a value,"



Spring dead spot symptoms generally show themselves as brown patches ranging from six inches to several feet in diameter. Affected areas will continue to pop up each spring and even grow in size by several inches without proper treatment.

PHOTO BY: BRIAN AYNARDI





Aynardi says. “It’s also a lot more complex than just that number. For comparison, you might find an insecticide with a value of 5. They’re very water-soluble and they can move further down. What we’re finding with fungicides is you can’t water them through the root zone except in cases where something has an extremely low Koc value. You also need other factors in place for that to happen like the light soil with sand, the weather, a lot of things in the world coming together to create that result.

“I don’t want people to think they can’t water things through a root zone,”

Jim Kerns, Ph.D., says recent research and the phasing out of older products makes overwatering a fungicide a concern of the past. “Some older products were more mobile in the soil. That’s part of the reason they were removed from the marketplace,” he says.

Aynardi continues. “You can. However, with Segway and Kabuto, you’re just not going to put down too much water to where it goes down too far. To even possibly do that, you’d have to be putting down something like a couple of inches of water, running the water for 24 hours straight. From a 1/8-inch to 1/4-inch irrigation post-application, you’re not going to overwater.”

For comparison, Aynardi cited other

products with Koc ratings as high as 16,000, making them essentially immobile in soil.

“With anyone who’s used Kabuto, I have yet to hear anything other than people being extremely satisfied with the outcomes they’re seeing,” he says. “People who use it love it. People who haven’t tried it and still have spring dead spot, I think, are missing the boat.” ©



## // Pathogen protection program

# Strong rootzones a last line of defense against nematodes

Experts advise that strong roots could be the difference between nuisance and disaster

By Jonathan Delozier

**N**ematodes and their effects on turfgrass are springing up in areas that used to be largely free from infestation, an outcome fueled by warm weather stretching into the latter parts of the year, according to industry experts.

Also known as roundworms, nematodes are among the most abundant animals on Earth. They can build populations as parasites in animals and plants or as free-living forms in soil, freshwater and marine environments. They've also been known to make themselves at home in vinegar, beer malts and water-filled cracks deep within the ground.

When symptoms of infestation begin to show on golf courses and other turfgrass areas, it's usually well after nematodes began wreaking havoc on underground roots.

Keeping those rootzones healthy is invaluable in combating nematode problems and can often act as superintendents' last line of defense, says

Joe Roberts, Ph.D., assistant professor, Clemson University.

"With nematode damage, it is associated with the nematode numbers, but there's also a correlation with plant stress," he says. "With nematodes, they're feeding on the roots, and if there's damage to the root system already present, that stress is going to make it easier for them to cause the damage. In



Joe Roberts

drought conditions, where a root system has been fed on and is drastically compromised, those plants aren't going to be able to withstand the drought conditions when compared to an area with no (nematode) problem."

A strong rootzone pathogen protection program is part of any successful and long-lasting nematode treatment regiment, Roberts adds.

"Kabuto, as a fungicide, is going to help with some of those diseases we see in accordance with nematodes," he says. "Particularly some of the diseases we're seeing in bermudagrass right now like spring dead spot, we do see some relationships with nematode feeding. That goes for cool- and warm-season turf. Having a well-designed fungicide program to make sure you're preventing those pathogens from impacting the root means those

**"Kabuto, as a fungicide, is going to help with some of those diseases we see in accordance with nematodes. Particularly some of the diseases we're seeing in bermudagrass ..."**

—Joe Roberts, Ph.D.





roots are going to hold up much better with nematode feeding.”

## Heading north

Nematodes were first identified in 1758, and there are around 25,000 known species. However, in particular, two stand out to experts when it comes to an infestation of U.S. turfgrass areas.

The sting nematode seen traditionally throughout Florida and the Carolina coasts manages to stay relatively strong year-round, with its peak occurring in the fall and winter. At the same time, root knot nematode populations can show up essentially anywhere in the country with its peak season lining up with summer and warmer months, says

**Turfgrass patches that are still brown or yellowing — as opposed to other areas greening up — are a tell-tale sign of a nematode infestation.**

William Crow, Ph. D., landscape nematologist at the University of Florida.

“Warmer conditions and the warmer season grasses are heading further north,



**William Crow**

and they’re bringing the nematodes along with them,” he says. “They’re moving around a lot compared to what we’re used to seeing. Nematodes have a great deal of interaction with fungi, so, typically, we get much better turf response when there’s nematicides and fungicides working in combination, not just one or the other.”

Roberts says he and colleagues are still working to determine whether nematode feeding can lead directly to pathogens that negatively affect turfgrass.

“We’re trying to design research to test some of these hypotheses and sort out these correlations that we’re seeing with the high nematode numbers and diseases that we’re seeing,” he says. “We’re not sure if it’s just a lack of vigor with the root systems or the actual feeding of the nematodes creating an infection. Again, if you’re in an environment where both fungal diseases and nematodes are an issue, having a

*Continued on page FS14*



# FOCUS ON FUNGICIDES



Superintendents should deploy stringent proactive measures, including promotion of strong rootzones, to nip nematode infestations in the bud before they show up on turfgrass, says William Crow, Ph.D., nematologist at the University of Florida.

*Continued from page FS13*

robust fungicide program is going to go a long way toward promoting turfgrass survival. You're still going to have to go back in and eliminate the nematode issues, as well."

Crow said a strong root system can sometimes overwhelm nematode infestations before they become a problem.

"A more competitive root system may be able to outcompete these nematode populations, in certain cases," he says. "The sting nematodes tends to do most of their reproduction in the spring and a little more in the fall, so that's when it's best to target your management for. With root knot nematodes, you're typically applying treatments around May, June, July and August."

## A unique organism

According to *Encyclopedia Britannica*, 35 nematode species have been identified in human body infestation, but most live in the top 15 centimeters of soil.

The most famous species, *Caenorhabditis Elegans*, is found in compost and

was the first organism to have its entire genome sequenced. It made headlines in 2003 when specimens were found to have survived the Columbia space shuttle disaster and remains the only organism to have its neuronal wiring diagram completed.

Nematodes are also essential in the nitrogen cycle and for regulating the decomposition of organic matter.

Populations are usually concentrated near their prey groups. Bacterial-feeders perpetuate near roots where bacteria congregate, fungal-feeders are near fungal biomass, and root-feeders are concentrated around roots of stressed or susceptible plants. Predatory nematodes are more likely to be abundant in soils where other nematode species are already present.

Because of their size, nematodes tend to be more common in coarser-textured soils, according to the U.S. Department of Agriculture.

## Sampling is key

Roberts says that taking soil samples

and other proactive measures are arguably just as important in combating nematode damage as treatment once symptoms arise.

"To really identify the problem you're dealing with, you have to sample," he says. "There can't be a lack of sampling. You may have an area that has a potential high population of nematodes but you have to identify what species you're working with, because they can impact grasses in different ways. Knowing the nematode population you're dealing with is a key first step because we have certain nematicides and products available to combat them, but sampling is going to do nothing but make you better prepared to set up a defense plan."

Echoing Roberts' sentiments, Crow adds that strong rootzones can be the difference between disaster and a short-term nuisance.

"If I have 25 sting nematodes and a really good root system, I'm not going to be that worried about it," he says. "If I have a compromised root system, 25 sting nematodes are enough to keep any roots from ever developing again. The (nematode) counts need to be taken into context with the overall root health, always. Otherwise, numbers can lack a lot of the meaning they need."

Crow urges turfgrass supervisors to be aware of which pest management products also act as fungicides and to plan their treatments accordingly.

"Some of your new nematicides that have come out are also SDHI (succinate dehydrogenase inhibitor) fungicides as well as nematicides," he says. "You need to be aware of that with your fungicide planning. Others don't have fungicide activity, and they don't have the SDHI chemistry. You have to be aware of all those things if you want to stay on top of any problem." ©

PHOTO BY: WILLIAM CROW, PH.D.



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# 75<sup>th</sup>

ANNIVERSARY





David Anderson, product manager for John Deere, says the OnLink system is all about harnessing data to help enable decisions down the road.

*Continued from page 18*

services when the time comes.”

Anderson says OnLink also allows equipment managers to lock out the use of specific equipment if it is, for instance, in the shop.

New in 2022 to the program is the ability to track where equipment is and has been on the course. OnLink’s telematics system provides real-time usage analysis to users. Anderson says that data is key to superintendents identifying operational inefficiencies.

Anderson says the driving force behind the software is harnessing data to help enable decisions down the road. In keeping with that theme of harnessing data, OnLink also has a labor-management side, where superintendents and teams plan the day or weeks and assign tasks to staff. The software takes those assignments and presents them to the staff in an easy-to-read format on a monitor in the maintenance facility. The time spent by staff on the task and the costs incurred performing it are automatically recorded, cataloged and available to the user through lab reports.

“Throughout the day, jobs change, things



David Anderson



John Deere’s OnLink system allows for the creation and editing of job boards from anywhere. change and the job morphs,” Anderson says. “Instead of having to run back and forth between the clubhouse or tracking someone down on the course to tell them, ‘Hey, your job has changed,’ those updates are reflected immediately on the boards.”

### Make old tech new again

Grinders aren’t necessarily a new technology, but in the eyes of Mike Rollins, eastern regional manager, SIP Grinders, they’re very much underestimated.

“Most superintendents I’ve met underestimate what grinders truly are capable of, and they under-utilize properly paralleled reel setup,” he says. “It’s one of the most impactful practices they can incorporate into their turf management programs.”

*Continued on page 36*

## LOOKING TO THE EVEN FURTHER FUTURE

Taking a look even further into the future, some more friends of the magazine suggested technologies still in development.

Bill Irving, superintendent, Wolf Creek Golf Club, Olathe, Kan., says he’s looking forward to seeing what the future holds for Zoysia. Irving says he’d like to see more fine-textured varieties that can hold up to the Kansas City winters.

In the vein of chemistries, Irving suggests PoaCure, a herbicide that aims to help control *Poa annua*. PoaCure claims to provide pre- and post-control of the weed, including both annual and perennial biotypes.

Irving says he’s “curious to see how membership supports what this does and how willing they are to go through the process since (killing Poa) can be ugly.”

With labor still being a major issue in the industry, autonomous mowers were a popular answer to our inquiry. Many say the future of golf is automation, allowing superintendents to use resources more efficiently.

In their responses, both Damon Di Giorgio, director of agronomy at Playa Grande Golf & Ocean Club in the Dominican Republic, and Alex Stuedemann, CGCS, director of golf course maintenance operations at TPC Deere Run in Silvis, Ill., mentioned autonomous equipment.

“Autonomous equipment whose price points will eventually reach a level where the return on investment is palatable for many operations,” says Stuedemann.

Steve Sarro, superintendent, Pinehurst CC, Denver, recommended solid footwear. Sarro



shared a picture of his new kicks with *Golfdom*, which he says helped him on the course.

“I just seeded 27 greens and my feet, knees and back feel great,” he says.



Mike Rollins, eastern regional manager for SIP Grinders, says he travels the East Coast of the U.S. with the Ideal 6000 and the Peerless 7000 on the back of his truck to give demos at courses.



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Continued from page 35

SIP's newest technology, which has superintendents like Thad Thompson, superintendent at Terry Hills GC in Batavia, N.Y., excited, is the V-Pallet — an add-on to SIP's Ideal 6000 unit.



Mike Rollins

“Our technology isn’t necessarily new to the industry; we made the first commercially viable reel grinder in 1902,” he says. “We’ve been making a surface plate reel grinder since 1994, and we’ve been using the V-Pallet since 2014.”

The V-Pallet, according to Rollins, is the only bedknife grinder that grinds the cut of its knife parallel to the pivot bolts.

“That eliminates any quality of cut and after-cut appearance issues because most issues I find start in the bedbar,” he says.

In an effort to spread the knowledge of grinders to superintendents, Rollins travels across the East Coast, presenting demos to interested courses.

“People are just now finding out about our technology because they need precision tools to help them set up and diagnose their cutting units in the high-quality, high-demand world of golf course maintenance in 2022.”

## Smart irrigation on the course

Rain Bird’s Cirrus PRO irrigation software doesn’t have an official release date yet — that’s something Bill Stinson, group product manager, and team are keeping under wraps. Still, with feedback received from field tests, Stinson and crew are optimistic it’ll make a significant difference in the life of a superintendent.



Bill Stinson

As Stinson describes it, Cirrus PRO is a mobile-first irrigation software designed to save superintendents the runaround when it comes to managing irrigation on their course.

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“It’s the first (irrigation) software, designed around the mobile user,” he says. “Where previously you had to make Post-it notes in the field and then run back and make changes; now with Cirrus PRO, the user is always connected to the irrigation system.”

Cirrus PRO is a reinvention of the previously released Cirrus system from Rain Bird, with upgrades like programming irrigation by seconds, volume, application or number of sprinkler rotations. According to Stinson, Rain Bird has optimized the program for mobile, making it an easy transition for those used to the desktop version.

The app has the full functionality of the Cirrus program on any internet-connected device. Stinson says Rain Bird improved the maps on the app in addition to the unlimited programs, holes and areas.

“(We thought) how do you improve on that? So, we said we needed to get the superintendent

*Continued on page 38*



Rain Bird’s Cirrus PRO allows users to use the full suite of options offered by the Cirrus software on any internet-connected device.

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*Continued from page 37*

out of the office. Having that powerful software is great, but sitting at a desk isn't where you want to be," Stinson says. "We've taken Cirrus and removed all the limits. Whatever your property is, Cirrus PRO can handle it."

Stinson says that in addition to improved maps, the software enables superintendents to have as many team members on the system as needed at the same time.

Stinson says Rain Bird received input from superintendents when designing the app, gaining their perspective on how to make them more effective water managers through using the software.

"Every software build we put out, we get feedback from multiple superintendents, saying 'Hey, I wish I could do this or that,'" he says. "There's been extensive feedback, testing and interaction with superintendents to get where we are."

### Always in control

Control is the name of the game with Club Car's Visage Fleet Management system. David Hules, golf portfolio leader, says the software is an invaluable way to protect the investment of not only golf cars but the turf as well.



**David Hules**

"(For) ground under repair, wet areas or car path only days, our technology can lock down the car so they can only go on the cart path," Hules said. "Or if they start to go too close to a green or a bunker, the variable speed car control will take over and reduce the car speed and eventually stop the vehicle if it encounters an action zone configured in this manner. And then, the golfer will have to put the car into reverse to get back into a safe area."

The system serves a similar purpose as an

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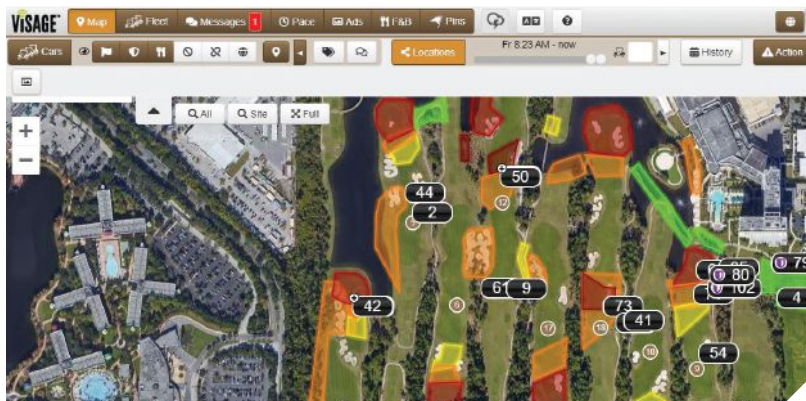
invisible fence, keeping cars restricted to certain areas of the course.

The other segment of the Visage system is car tracking, which is as simple as it sounds. Superintendents can use GPS technology located inside the car to track where it is at any time. They can also use the software to send messages to the cart through a separate screen located in each vehicle.

Hules says the system also helps superintendents keep track of the runtime of each car, making fleet rotation easier.

In its current form, Visage is a desktop-only program, but Hules says Club Car is working on a mobile version that will allow superintendents to keep track of cars when they are out on the course. **G**

David Hules, golf portfolio leader for Club Car, says superintendents can message cart users using the Visage program, letting them know if they're moving too slow or if there's an emergency.



PHOTOS BY: CLUB CAR

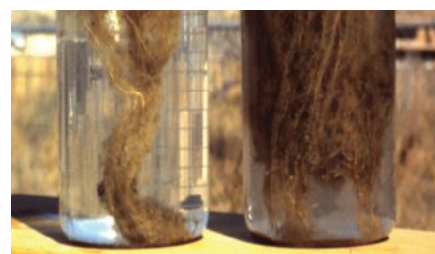
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## NEWS UPDATES

### PBI-GORDON ANNOUNCES TWO NEW HIRES

PBI-Gordon hired Geoff Smith as the company's national key account manager and Lyndsie Balstad as a product manager.

Smith will enhance customer relationships with key account decision-makers in the golf market. He will also help identify new opportunities for product placement and work to enhance PBI-Gordon's existing product portfolio.

Prior to PBI-Gordon, Smith was a formulator sales territory manager for Gowan USA. He also worked at The Scotts Company as a manager of global active ingredient sourcing. Smith earned his master's from Ashland University.

Balstad's focus is on the company's herbicide portfolio, supporting product life cycle management and driving innovation to bring new products to the market.

Prior to PBI-Gordon, Balstad was a sales effectiveness manager for the Pioneer Seed brand at Corteva.

Previously, she served as Corteva's U.S. corn herbicides product manager, where she was responsible for the launch of Resicore herbicide and pricing programs during the merger of DuPont and Dow AgroSciences.

Balstad holds a bachelor's in applied economics from the University of Minnesota.

## // ON THE MARK

# TECH SOLUTIONS TO LIMIT PGR OVERSPRAY ON COLLARS

By Darin Bevard

Overspray of PGRs into collars and surrounds has long been a problem for turf quality. Like mechanical damage, this problem can be especially bad where warm-season grasses surround cool-season putting greens. However, recent research has shed light on how problematic growth regulator applications can be for any collar-height turf surrounding a putting green.

University of Nebraska research showed the degree of seasonal variation in PGR metabolism and how growing degree day (GDD) accumulation is better for predicting when superintendents should make reapplications than calendar days. Turf metabolizes PGRs more quickly under warmer conditions and superintendents need to apply PGRs more frequently to maintain consistent regulation than they do under cooler conditions.




Putting green collars receive constant abuse and often experience turf issues. Technology could provide a solution to get better performance.

This research also indicates that turf at putting green height requires more frequent applications of PGRs than fairway or collar-height turf to maintain steady growth suppression. Additionally, relative regulation at the same application rate is much higher on collar-height turf compared to green-height turf. Even when superintendents follow GDD models for putting green applications, overspray into collars can still lead to severe overregulation. The growth rate of the grass is inadequate to recover from traffic, which leads to a decline.

## PREVENTION

Covering collars with carpets during spraying, immediately washing PGRs off the collars after application or leaving small untreated strips around the edges of putting greens to prevent overspray are all options to limit this problem. One of the simplest and most effective solutions is to use GPS sprayers.

GPS sprayer technology limits overspray into nontarget areas, and individual nozzle control offers very precise application. It is not a perfect solution, but this technology can substantially reduce PGR overspray on collars. 

Darin Bevard is the senior director of championship agronomy for the USGA. This Super Science Introduction feature is just one section of his article on how to prevent putting green collar decline, see the reference section for the link to the complete article.

## Reference

Darin Bevard. 2022. Strategies to Prevent Putting Green Collar Decline, USGA Green Section Record. 60(06) April 1, 2022. <https://www.usga.org/content/usga/home-page/course-care/green-section-record/60/06/strategies-to-prevent-putting-green-collar-decline.html>

## DATA-DRIVEN

MANAGEMENT IS ANOTHER BENEFIT SUPERINTENDENTS WILL NOTICE AS A RESULT OF GPS TECHNOLOGY"

Chase Straw, Ph.D.

(see story on page 44)



This project was funded in part by the USGA Green Section.

PHOTO BY: USGA

// **READY, SET, DON'T GROW**

# How surfactants influence PGR performance and turfgrass quality

By Mark Keck, Bill Kreuser, Ph.D., Brianna Hitt, Ph.D.

**P**rimo MAXX [trinexapac-ethyl (PM), Syngenta] and Cutless MEC [flurprimidol (CM), SePRO Co.] are two commercial PGRs in the turfgrass industry used to suppress clipping yield production (2). Temperature inversely correlates to the duration of clipping yield suppression following a PGR application. Superintendents can estimate reapplication intervals from growing degree day (GDD) reapplication thresholds (5). There is interest in lengthening these GDD intervals by including tank-mixed adjuvants with PGR applications.

A previous study showed that mixing a surfactant with PM will increase cover and decreasing irrigation in bermudagrass (*Cynodon dactylon*) showed that combining a surfactant with an older formulation of PM called Primo increases the uptake and absorption of the active ingredient (3,8,9).

PM replaced the original Primo formulation in 1999. This new formulation uses a different inert package to improve PM uptake and ease of use. The product label states that PM should not be tank-mixed with herbicide or wetting agents (7).

Primo MAXX is foliar-absorbed, whereas CM is root-absorbed. It is

unknown whether adding additional surfactants to this new formulation will enhance or decrease the PGR's efficacy. It is unclear whether tank-mixed surfactants will improve the effectiveness of root-absorbed PGRs. The objective of this research was to determine whether different surfactants enhanced the performance of PM or CM.

## SITE CHARACTERISTICS AND EXPERIMENTAL DESIGN

We conducted field research from June 19 to Oct. 30, 2017, and from July 9 to Oct. 30, 2018, on a creeping bentgrass fairway at the University of Nebraska-Lincoln East Campus Turfgrass Plots. Crews mowed the site three times weekly and irrigated to a calculated 80 percent of potential evapotranspiration (1). Every two weeks, we fertilized the plot with 0.2 pounds N per 1,000 ft.<sup>2</sup> (46-0-0, N-P-K). We withheld soil surfactants, demethylation inhibiting fungicides and sand topdressings throughout the study.

The experimental design was completely randomized with a minimum of three replicates. We used different control treatments to assess the PGR plus surfactant performance. They included PM or CM applied alone to study the impact of the surfactant/PGR combinations. There also were five non-treated control plots to calculate the relative clipping yield for all treatments.

We arranged treatments in a completely randomized design with a 2 × 4 factorial of two PGRs and four surfactants (Table 1). The initial applications occurred on June 6, 2017, and July 9, 2018. Crews made the second applications on Aug. 31, 2017, and

Sept. 10, 2018 (Table 2). We used a 5-foot-wide three-nozzle (Teejet AI8006, TeeJet Technologies) boom backpack sprayer to make the applications. We calibrated the sprayer to deliver a spray carrier volume of 85 gallon acre<sup>-1</sup> at 40 lb. in.<sup>-2</sup>. We hand-watered in Cutless MEC with 0.5 inches of water applied by a hose fitted with a flow meter (Table 1).

The team collected clippings on Monday and Friday from 0 to 850 GDD (base 0 degrees C) after treatment application and once weekly after 850 GDD. We collected, dried and weighed clippings (5). We performed sine wave regression of clipping yield over time to determine the amplitude and period of the PGR response model in Sigma Plot Version 14 (Systat Software) (6). We analyzed data from each run and each year separately. Individual runs for the treatments were not statistically different and we pooled them to increase statistical power (data not shown).

Our team collected visual quality using the National Turfgrass Evaluation Program 1 to 9 rating system, with a score of 6 or greater being acceptable (4). We averaged quality ratings of the four runs by JMP Version 13 (SAS Institute).

## TWO SURFACTANTS ENHANCED PRIMO MAXX SUPPRESSION

The addition of the surfactant to PM did not significantly impact the duration of clipping yield suppression compared with PM applied alone (Table 3, Figure 1). There were differences in the amount of suppression between the PM applied alone compared to the straight block co-polymer + PM and organosilicone + PM treatments. Straight

Continued on page 42

### Research Takeaways

- Primo MAXX mixed with surfactant did not increase the duration of suppression.
- Primo MAXX + organosilicone and Primo MAXX + co-polymer increased suppression.
- Cutless mixed with the surfactant did not increase the duration.
- Visual quality ratings were reduced with some PGR + surfactant combinations, but the visual quality rating was never deemed unacceptable.



**TABLE 1**

**Plant growth regulator (PGR) rates, surfactant rates, surfactant classification and immediate action after application**

PGR	PGR rate	Surfactant	Surfactant rate	Surfactant classification	Immediate action after application
	fl oz 1000 ft <sup>-2</sup>				
Primo MAXX <sup>a</sup>	0.25	None	NA <sup>b</sup>	NA	Dry
	0.25	Straight block co-polymer <sup>c</sup>	8 fl oz 1,000 ft <sup>-2</sup>	Wetting agent	Dry
	0.25	Revolution <sup>d</sup>	8 fl oz 1,000 ft <sup>-2</sup>	Wetting agent	Dry
	0.25	Organosilicone <sup>e</sup>	0.5% v/v	Adjuvant	Dry
	0.25	Proprietary NIS <sup>f</sup>	0.5% v/v	Adjuvant	Dry
Cutless MEC <sup>g</sup>	0.56	None	NA	NA	0.5 in; watered in
	0.56	Straight block co-polymer	8 fl oz 1,000 ft <sup>-2</sup>	Wetting agent	0.5 in; watered in
	0.56	Revolution	8 fl oz 1,000 ft <sup>-2</sup>	Wetting agent	0.5 in; watered in
	0.56	Organosilicone	0.5 percent v/v	Adjuvant	0.5 in; watered in
	0.56	Proprietary NIS	0.5 v/v	Adjuvant	0.5 in; watered in

<sup>a</sup> Syngenta Co., 11.3 percent a.i.

<sup>b</sup> NA, not applicable.

<sup>c</sup> Straight block co-polymer (Tria Global Solutions).

<sup>d</sup> Modified methyl capped co-polymer (Aquatrols).

<sup>e</sup> Exacto 524 (Exacto).

<sup>f</sup> NIS, nonionic surfactant (Exacto 1057 [Exacto]).

<sup>g</sup> SePRO Co., 16 percent a.i.

**TABLE 2**

**Application dates and final clipping collection dates for 2017 and 2018. The second application of the year occurred after a minimum of 1,000 growing degree days (GDD; base 0°C) was surpassed from the first application.**

Date applied	Final clipping collection date	Accumulated GDD <sup>a</sup>
		GDD
19 June 2017	8 Aug. 2017	1,229
31 Aug. 2017	26 Oct. 2017	1,037
9 July 2018	29 Aug. 2018	1,465
10 July 2018	26 Oct. 2018	672

<sup>a</sup> GDD is the summation of daily average air temperature in °C.

**TABLE 3**

**Application dates and final clipping collection dates for 2017 and 2018. The second application of the year occurred after a minimum of 1,000 growing degree days (GDD; base 0°C) was surpassed from the first application.**

Treatment	Period	Time to maximum suppression	Clipping yield suppressed
	— GDD <sup>a</sup> —	— GDD —	— % —
PM <sup>b</sup>	1,620.6 <sup>c</sup> AB	341.9	42
PM + Straight Block Co-polymer <sup>d</sup>	1,581.4 AB	328.0	63
PM + Revolution <sup>e</sup>	1,708.0 A	364.0	46
PM + Organosilicone <sup>f</sup>	1,664.6 B	349.4	52
PM + Proprietary NIS <sup>g</sup>	1,755.0 A	359.0	46

<sup>a</sup> GDD is the summation of daily average air temperature in degrees Celsius.

<sup>b</sup> Syngenta Co., 11.3 percent a.i.

<sup>c</sup> Different capital letters within a column indicate significant differences.

<sup>d</sup> Tria Global Solutions, LLC.

<sup>e</sup> Modified methyl capped co-polymer, Aquatrols

<sup>f</sup> GExacto 524, Exacto

<sup>g</sup> NIS, nonionic surfactant (Exacto 1057, Exacto)

Continued from page 41

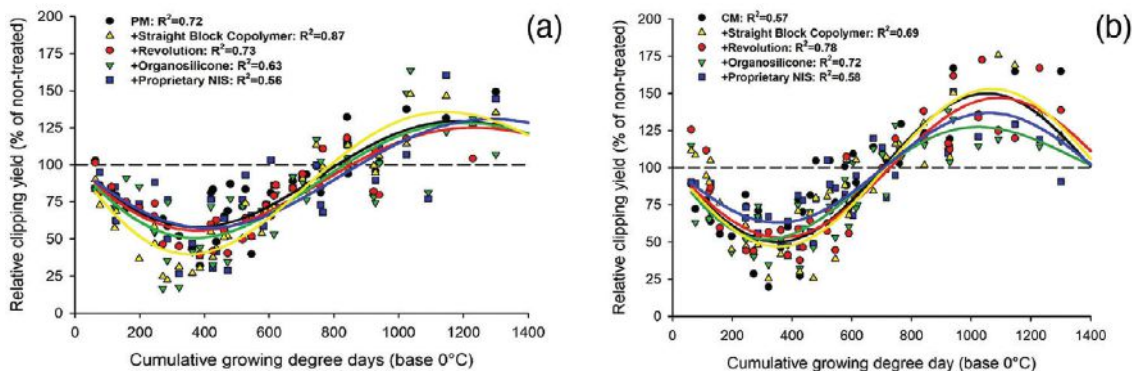
block co-polymer + PM suppressed yield by 63 percent, whereas the PM applied alone suppressed yield by only 42 percent. Organosilicone + PM suppressed clipping yield by 52 percent.

Past research indicated the application rate influences the amount of suppression but not the duration of clipping yield suppression (5). Organosilicone adjuvants could increase PM absorption and suppress clipping yield (3). The increased clipping yield suppression with these surfactants without increased suppression duration could suggest that the straight block co-polymer and organosilicone surfactants increased PM uptake.

The proprietary nonionic surfactant (NIS) + CM reduced suppression compared to CM applied alone (Figure 1). The NIS + CM treatment had a maximum clipping yield suppression of 38 percent (Figure 1). The CM control had 49 percent suppression. We saw no significant differences in growth suppression duration between the CM treatments (data not shown). Mixing a surfactant with CM may have limited effects because CM is root-absorbed.

The overall visual quality ratings

FIGURE 1



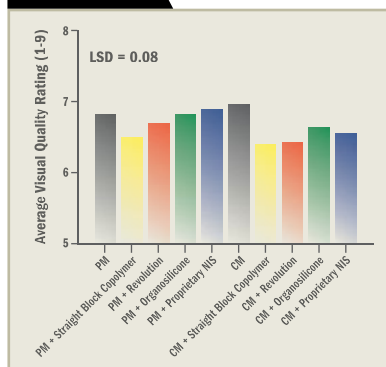
Sine wave regression model of the two different plant growth regulators. The predicted relative clipping yield is indicated by the dotted line. The dotted line represents the relative clipping yield of the control. Data from 2017 and 2018 was pooled together from both applications for greater model resolution. (a) Primo MAXX (PM) was mixed with different surfactants (straight block co-polymer, Revolution, organosilicone, proprietary nonionic surfactant [NIS]) and applied without a surfactant. (b) Cutless MEC (CM) was mixed with the same surfactants or CM was applied alone.

rated from 6.0 to 6.8 among all treatments (Figure 2). The addition of surfactants to PM and CM did not result in significant or unacceptable phytotoxicity. The PM control and the PM with surfactants had visual quality ratings of 6.6 to 6.8. Mixing PM with a surfactant did not reduce turfgrass quality to unacceptable levels. The PM + straight block co-polymer reduced the turf quality rating compared to the non-treated control.

The application of CM alone had a similar quality to all the PM treatments. However, the addition of the different surfactants to PM resulted in lower average quality than the CM control (Figure 2). The magnitude of the decline in visual quality rating was less than one-half of a quality unit and the mean visual quality rating was never <6.0.

None of the surfactant treatments increased the duration of PGR growth suppression for both PM and CM. Any of the surfactant treatments did not increase Cutless MEC suppression. Adding a surfactant to PM sometimes enhanced clipping yield suppression, but can also reduce turfgrass quality rating. Increasing the PM application rate can also increase clipping yield suppression. Adding surfactants to CM,

FIGURE 2



Average visual quality rating over 2017 and 2018 across all treatment applications from the fall and spring. Primo MAXX (PM) and Cutless MEC (CM) were mixed with four different surfactants (straight block co-polymer, Revolution (Aquatrols Co.), organosilicone, and a proprietary nonionic surfactant [NIS]). Quality scores were ranked on a 1 to 9 scale, with a score of 6 or greater being acceptable.

a root-absorbed PGR did not enhance clipping yield suppression or lengthen the products' duration. The surfactants slightly reduced turfgrass quality. These results do not support the addition of tank-mixed surfactants to CM. ©

Mark Keck, William Kreuser, Ph.D., and Brianna Hitt, Ph.D., are with the University of Nebraska-Lincoln. Contact Bill Kreuser at [bill@green-keeperapp.com](mailto:bill@green-keeperapp.com) for more information.

## Acknowledgments

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**Know your course better** GPS technology offers many benefits for turfgrass managers, including soil moisture maps.

## How to reap the benefits of GPS technology

As GPS technology becomes more common in turfgrass management, experts say now is the time to realize its various benefits

By Chris Lewis

As GPS technology becomes more prevalent in turfgrass management, Chase Straw, Ph.D., assistant professor, turfgrass management and physiology in Texas A&M University's department of soil and crop sciences, believes golf course superintendents will reap many benefits.

Straw says the most immediate benefit superintendents will notice is the installation of GPS on maintenance equipment. Superintendents see location information on new equipment like autonomous mowers and GPS sprayers.

Small GPS units, which golfers place in their pockets, help superintendents better understand the foot traffic on their golf courses. Superintendents can use this information to identify highly managed areas that aren't typically in play and convert them to native areas.

"GPS on golf carts has many benefits too. One of the greatest — particularly from a management standpoint — may be the ability to geofence areas of golf courses where



**Chase Straw**

golf cart traffic isn't wanted," Straw says. "Data-driven management is another benefit superintendents will notice, as a result of GPS technology."

Straw says researchers utilize GPS-equipped sensors — from multispectral/thermal cameras on drones to soil moisture sensors — to identify and quantify variability across golf courses, leading to targeted applications of management inputs.

Of equal importance, Straw says aerial imagery from drones — along with other sensor data — helps superintendents scout for pests and turfgrass issues.

"The technology is improving, and more research is being conducted with data to utilize artificial intelligence and machine learning models to correctly identify issues and predict their occurrence or outbreak," he explains. "This information will be valuable to superintendents so they can be on offense, rather than constant defense, with their management."


He adds, "This should enable superintendents to have more informed decision making with their management inputs so that applications are made more efficiently." 

PHOTO COURTESY OF: CHASE STRAW

## E-Z-GO

### JOHN COLLINS

VP and general manager



Previously known as Textron Fleet Management, E-Z-GO's Pace Technology, a GPS product lineup, partnered with GolfLogix, and superintendents manage their courses' fleets and operations in real time. Through the GPS product lineup, they have various operational efficiencies, including geofencing capabilities to protect their courses' grounds. Additionally, they can establish speed enforcement areas, ensuring golfers help maintain course conditions as they drive carts. And they're able to locate carts from any place — at any time. The product lineup enables superintendents to constantly maintain their courses' fleet vehicles, too. In doing so, they're able to boost their equipment efficiency considerably, as they can utilize activity zones to analyze their colleagues' travel time within their facilities and effectively manage their day-to-day workloads. Superintendents can monitor their vehicles' maintenance requirements via the product lineup's remote diagnostics offerings.

## GreenSight Agronomics

### KEVIN HAUSCHEL

Commercial agriculture/  
West Coast golf and sports lead



GPS technology helps superintendents scout for diseases and turf issues on their golf courses by allowing them to have an exact location to refer to. The industry started with GPS technology in handheld sensors, such as POGO and TDR, to measure moisture, salinity and temperature while also having a location for the reading. Now, thanks to further advancements in GPS technology, we're beginning to add automation into the data collection process. The turf management industry currently has wireless, in-ground soil sensors like Soil Scout and above-ground technology via daily, automated drone flights from GreenSight. These technologies enable superintendents to scout their entire golf courses with one 20-minute drone flight. Or they can look at soil sensor information in real time, combined with drone imagery. All geographic information can be found — via GPS — in our TurfCloud digital job board, allowing superintendents to stay ahead of potential stresses or diseases.

## Frost Inc.

### KEN ROST

Founder and CEO



Frost Inc. offers superintendents GPS technology that shows sprayer operators exactly where they have been and where they need to spray. The technology also enables control of each spray nozzle. By controlling every nozzle independently, superintendents' applications are more accurate. Additionally, due to GPS controllers, superintendents have records of their applications, which can be saved and used as training tools for new operators or — upon request — provided to regulatory agencies. As far as scouting is concerned, superintendents can mark areas of higher or lower disease pressure. They can then prescribe different application rates for those areas, and the GPS sprayer will execute the prescription. With GPS technology, our sprayers also provide two nozzles at each nozzle position, allowing for a wider range of prescription rates and speeds.

## John Deere Golf & Sports

### DAVE ANDERSON

Product manager, John Deere  
Turf Care



By incorporating GPS technology in daily practices, superintendents can save time and money. Specifically, our John Deere GPS PrecisionSprayers help decrease chemical usage. One of the most notable features of the GPS PrecisionSprayer is AutoTrac, which enables superintendents to spray predetermined areas in less time and with greater pass-to-pass accuracy. Superintendents using the GPS PrecisionSprayer can electronically capture all spray data and analyze the results. Automated documentation eliminates the need for manual recording and increases the accuracy of recording spray event information. Individual nozzle control helps minimize application errors and reduces operator fatigue, as they don't need to focus on manually turning boom sections on and off. Reports and visual analytic tools help superintendents compare spray events and relate the state of the turf to specific conditions along with overall course health.





“At a time when golf started a new boom, students completed internships. Working outside in a relatively safe environment, with implemented COVID protocols, helped maintain the enthusiasm students need to become turf industry professionals.”

**KARL DANNEBERGER, PH.D.,** *Science Editor*

## A unique graduation for this year's turfgrass seniors

**O**n Mothers Day, I drove by The Ohio State University campus as the class of 2022 was graduating in the stadium. On that beautiful day, family and friends filled the stadium to honor 12,345 graduates. As part of honoring the graduating class, our department initiated a ritual where faculty members wrote handwritten notes on cards for our graduating seniors.

As I wrote my messages and cards to the turfgrass graduating seniors, I couldn't help but think about what these students experienced since arriving on campus as either incoming freshman or transfer students.

### THE SWITCH TO VIRTUAL

Many of these students spent the majority of their academic careers engulfed in the COVID-19 pandemic. During spring break in 2020 — which at the time was the middle of March — the university prohibited students from returning to campus. The shock of not coming back impacted everyone, but it must have been especially difficult for students whose home was halfway around the world.

The majority of courses taught face to face converted to online in a week. These online offerings continued through the 2020-2021 academic year.

Continual testing, quarantines, safe spacing, inability to attend sporting events, lack of personal contact with fellow students and faculty and closed

campus restaurants and bars characterized the 2020-2021 academic year. Basically, students faced a degree of isolation not associated with normal college life. In addition, given the immense impact the pandemic had on the country, with one million Americans dying, students faced personal death or severe sickness of family members, friends and colleagues.

As these graduating students emerge from the prolonged pandemic that had campus restrictions into March 2022, I wonder what will happen as they move forward. One sign I observed this spring was that many, not all, of the graduating seniors opted to forego a portion of their senior assignments.

Many students did extremely well on a quiz and exam section but did not complete the cognitive writing part of the course, which resulted in a significant grade drop. This happened occasionally in past classes, but not to the extent it occurred this spring.

Speaking with a few students across

campus, I learned seniors were tired of school and just looking to get out. This is hardly a scientific study, and I consider it anecdotal, but I can appreciate the general feeling. Fortunately, given the current job market not only in the golf industry and across various career paths, most students already secured a job upon graduation, and those final grades were not important.

### FUTURE IMPLICATIONS

Over the coming years and decades, researchers will conduct studies and surveys on various subgroups of that population that went through the pandemic. One group will be college students who survived the pandemic and came of age during this period. It is these studies that will be most interesting to me. It is like this group went off to war for 2 1/2 years, and we will follow what happened to them over their lives.

Although I do not think this year's college graduates got the full academic and personal experience as their predecessors, the commitment to finish their degree during a tough time reflects strong character traits.

Graduating turfgrass students had a few advantages during this pandemic due, in a large part, to many golf course superintendents. At a time when golf started a new boom, students completed internships. Working outside in a relatively safe environment, with implemented COVID-19 protocols, helped maintain the enthusiasm students need to become turf industry professionals.

As we see graduating students enter our profession, they bring a perspective of sacrifice and a graduation enthusiasm that will shape our industry well into the future.

Hail to the class of 2022! 🇺🇸

Karl Danneberger, Ph.D., *Golfdom's* science editor and a professor at The Ohio State University, can be reached at [danneberger.1@osu.edu](mailto:danneberger.1@osu.edu).

# How to manage spotted lanternfly

While spotted lanternfly may not be a pest of turf, that doesn't mean it won't bug golfers

By Christina Herrick

**A**lan FitzGerald, CGCS, MG, superintendent at LedgeRock Golf Club in Mohnnton, Pa., vividly remembers his early experiences with spotted lanternfly (SLF). LedgeRock is about 10 or 15 miles from the first known location of SLF in the U.S. in 2014. Since then, researchers have found populations in New Jersey, New York, Ohio, Connecticut, Maryland, Delaware, Virginia and West Virginia.



Alan FitzGerald

It took a couple of years for the pest populations to grow in Pennsylvania, but in 2018 and 2019, FitzGerald said SLF's presence on the golf course was intense.

"We had a maple tree that the whole bark was just moving because they were just moving up and down the bark," he says.

And, as expected, with the populations that LedgeRock experienced, FitzGerald said golfers and members worried these bugs — about an inch in length — would cause massive damage to the course.

FitzGerald, *Golfdom's* 2019 Herb Graffis Businessperson of the Year award winner, and the LedgeRock team never applied chemical controls. They opted to wait it out each year. FitzGerald says populations were low last year. When pest populations were high, the team at LedgeRock deployed lanternfly ID cards from the Pennsylvania Department of Agriculture to help golfers understand the threat to the course. He said he put the cards in the clubhouse for members. He also communicated with members through course updates on how LedgeRock worked with Penn State and the Department of Agriculture to control SLF's spread.

## WHAT TO KNOW

Brian Walsh, Penn State Extension horticulture educator for Berks County, suggests superintendents approach spotted lanternfly management in two different ways, depending on whether their course is in an area with an established population or located in a satellite population.

"If you are in an area where they haven't been reported yet, record it and make sure the local government agencies have become aware of them," he says. "There's some hope that if caught early enough, the government agencies responsible will be able to treat and knock down a satellite population."

Walsh suggests superintendents visit [extension.psu.edu/spotted-lanternfly-management-guide](http://extension.psu.edu/spotted-lanternfly-management-guide) to learn more about effective management for spotted lanternfly. While the removal and killing of egg masses can help slow populations, Walsh says the team at Penn State learned spotted lanternflies lay the majority of egg masses in the top two-thirds of a tree, which makes both scouting and destruction of egg masses challenging.

Walsh says the feeding habits of SLF change depending on its life cycle. While tree of heaven is a plant the pest favors, the first and second instars feed on lush new growth, including perennial plants. Roses, too, are a good indicator plant on a property for early instar nymphs.

## HOW TO MANAGE SLF

When it comes to chemical controls, Chris Williamson, Ph.D., Midwest research scientist for PBI-Gordon, says, "there are many things to consider before deciding to use an insecticide to kill SLF on trees or shrubs."

While spotted lanternflies are easy



to control with insecticides, including PBI-Gordon's Zylam (dinotefuran), he encourages superintendents to consider cultural controls first. These include promoting plant health, removing host plants, eliminating egg masses when necessary, trapping to monitor populations and destroying nymphs and adults, and using soaps and oils.

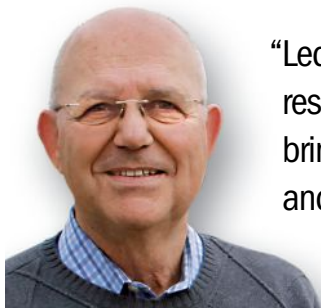


Chris Williamson

When lanternflies feed, the adults secrete a sticky substance called honeydew. Honeydew is messy and also attracts yellow jackets and other stinging insects. High insect populations and honeydew can be a big motivator for courses to opt for chemical controls, especially if the course hosts major events or weddings, Walsh says. But, he encourages superintendents to be mindful of when to make pesticide applications.

"We are urging people to make good choices with their pesticide use and make that determination," he says. "Is it really necessary to use it? Evaluate the benefit to the customer or the property before automatically going for the insecticides."





“Led by Cole Thompson, Ph.D., the research program is how the USGA brings to life its mission to champion and advance the game.”

**MIKE KENNA, PH.D.**, *Research Editor*

## How USGA grants advance the future of golf course management

**I** am fortunate to serve as a volunteer committee member on the USGA Mike Davis Program for Advancing Golf Course Management. After directing the program for 30 years, it is rewarding to help plan future research, evaluate proposals and travel to see funded projects at universities.

The USGA allocates \$1.8 million each year for 70 to 80 separate research projects through the USGA Davis Grants.

The annual investment in the program is part of the USGA's continuous efforts to support the long-term health and sustainability of golf.

Overall, past research results save the golf industry an estimated \$1.92 billion in operating costs annually, including:

- \$201 million for irrigation with evapotranspiration estimates of turf-grass water use
- \$530 million for irrigation scheduling with soil-moisture meters
- \$295 million for more efficient fertilizer and pesticide use
- \$243 million for implementing better putting green construction techniques

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- \$174 million for converting to new turfgrass cultivars
- \$469 million for incorporating naturalized rough

## DOLLARS AT WORK

The 2022 grant recipients include more than a dozen universities in the U.S. and represent both short- and long-term projects that focus on science-based management practices, turfgrass innovation and environmental stewardship. The grant recipients will receive an average of \$88,000 in funding over the next three years. Individual grant awards range from \$30,000 to \$120,000.

Applicants for a USGA Davis Grant must demonstrate how their work will achieve one or more of the three main USGA strategic program objectives:

- 1) optimizing sustainable golf course management and playing conditions;
- 2) protecting and conserving water resources; or
- 3) identifying and developing novel plant materials.

Notable projects funded in 2022 include a national, multi-university evaluation of drought tolerance and water use of grasses commonly used for fairways; a Texas A&M project that aims to reduce fertilizer use with site-specific, digital estimates of nutrient requirements and turfgrass breeding programs at several universities improving the quality, stress tolerance and resource-use characteristics of turfgrasses.

## EYE TO THE FUTURE

Since the founding of the Green Section in 1920, the USGA has led the

effort to enhance golf course sustainability through the development and support of research that produces a healthier environment and improved playing conditions.

The resulting sustainable management practices have contributed to a 20 percent decrease in water usage and an almost 40 percent decrease in nutrient usage by golf courses in the last decade.

Led by Cole Thompson, Ph.D., the research program is how the USGA brings to life its mission to champion and advance the game. In addition to this program, the USGA also invests in research that benefits other areas of course sustainability and golfer experience. **G**

Mike Kenna, Ph.D., retired director of research, USGA Green Section. Contact him at [mpkenna@gmail.com](mailto:mpkenna@gmail.com).

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# The Shop

// MUST-HAVE NEW PRODUCTS



1



2



3

## 1 | XUV835R/XUV865R Signature Edition

The **JOHN DEERE** XUV835R and XUV865R Signature Edition vehicles, launched in early 2022, feature new additions to the standard Deere features. The Signature Gator Utility Vehicles feature genuine leather seats and leather-wrapped handles, an integrated infotainment system, a seven-speaker sound system, a rear-facing camera, Bumper Pro Brush Guard, front roof-mounted LED driving lights and rear-sliding windows.

[Deere.com](https://www.deere.com)

## 2 | MobileDefender Model S

The MobileDefender Model S (MD-S) from **SECURATRAC**, introduces new capabilities that will help ensure the safety of those who use it. The MD-S can detect horizontal and vertical movement, so if an employee falls on the job or gets knocked over, they do not have to initiate a call for help. The MD-S has a new Wake-on SOS feature to improve battery life, which gives the device the ability to last over 30 days on a single charge.

[SecuraTrac.com](https://www.securatrac.com)

## 3 | Ellwee Easy

**ELLWEE**'s Easy is an electric golf cart with a 48V 63Ah or 48V 100Ah battery and a unique single-seat design. The Ellwee Easy has all the functionalities of the Ellwee X with new characteristics and features that lead to high levels of stability and handling. The cart can reach a top speed of 15 mph and a range of 41 miles.

[Ellwee.com](https://www.ellwee.com)



4



5

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To stay up to date on all the latest products and services, visit [golfdom.com/category/products](https://golfdom.com/category/products)



6

#### 4 | Pro-Fill on-board battery watering system

The Pro-Fill on-board battery watering system from **FLOW-RITE** allows users to fill all cells to the ideal level simultaneously. The Pro-Fill single-point solution's design has a built-in water barrier and flame arrestor to prevent sparks from igniting adjacent battery cell gases. Installing the Pro-Fill Onboard Battery Watering System is a DIY project that doesn't require modifying the 6-, 8- or 12-volt battery case.

[Flow-Rite.com](https://Flow-Rite.com)

#### 5 | Tempo Li-Ion

**CLUB CAR**'s second-generation Lithium-Ion powertrain has a high-performance battery pack that saves money and time, increases car reliability and conserves energy. The car comes with a 650-watt charger or an optional 950-watt charger. According to Club Car, the AC Li-Ion battery system ensures golf course operators can have confidence in achieving 36-plus holes on one charge.

[ClubCar.com](https://ClubCar.com)

#### 6 | GC2 48V Lithium-Ion Battery

The GC2 48V Lithium-Ion Battery from **TROJAN BATTERY CO.** has a proven range of 45-60 miles on a single charge with a three-battery configuration. The GC2 48V meets SAE vibration tests, lasts two to three times longer than lead-acid batteries and features an eight-year warranty. The battery is also protected from dust, sand and water. It meets international safety and performance standards down to the battery cell level. Made with a stable chemical formula (LFP) with redundant safety features, its battery monitoring system self-protects against short circuits and overheating.

[TrojanBattery.com](https://TrojanBattery.com)



# The 19<sup>th</sup> Hole

## David Jones

**SUPERINTENDENT** // The Club at Indian Springs, Broken Arrow, Okla.



### David, what are you drinking?

A Cutwater Vodka Mule. I discovered them for the first time at the GCSAA tournament in San Diego; they're so good.



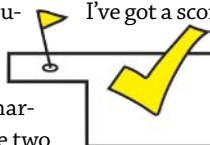
**Tell me about your course.** I'm at The Club at Indian Springs in Broken Arrow, Okla. We're a private facility with 36 holes. One of the courses has Champion Bermuda greens, the other has SR-1020 bentgrass greens, so the best of both worlds. I've been here 21 years, the superintendent for the last 10.

**Do you have a family?** I've been married since 2005. No kids, but we have two dogs, a German shepherd and a Pyrenees mix, so it's like having kids.

**What's your favorite vacation?** Going to Australia. My wife is Australian. We

went to Sydney several years ago; I'm looking forward to going back. She still has family over there, her mom and sister. The culture there is so laid-back. Whenever you say 'thank you,' they never say 'you're welcome,' they always reply with 'no worries.' It's such a different place.

**You've played every golf course in Oklahoma. How long did it take?** I finished it last May. It took me 15 years. I've got a scorecard from every course



except one. I've got a logo ball as well if they had one.

**What is your favorite tool in the shop?** The cup cutter. I love changing cups and getting out in the



morning, seeing the course. It's a simple tool, easy to use.

**If you had my job for a day, what would you do?** You have a pretty cool job where you get to go around and interview superintendents, and you go to a lot of the major championships. I would just enjoy meeting so many superintendents. I love to network in our industry.

### What is your all-time golf highlight?

I love playing golf; I love everything in the golf industry — I can't get enough of it. My all-time highlight is getting to play St. Andrews, the Old Course, with (retired St. Andrews superintendent) Gordon Moir. He was a very generous host. We were to be the first ones off, but they had a frost delay. There, you don't get pushed back, you just get canceled. Luckily, I was with him, so he made it so that we were the last tee time of the day. We got through 18 with just a little bit of daylight left. We then got to tour the R&A clubhouse because I was with Gordon. Just an awesome highlight to an awesome trip.

As interviewed by Seth Jones, April 13, 2022.

### // BEST ADVICE

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Alex Stuedemann  
Director of Golf Course Maintenance Operations  
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