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The Star Command 5200 will be at Smithco and TeeJet booths at the GIS Expo, in Orlando, FL, Jan 29-30.



While no one has perfect 20/20 vision for what the future holds, our annual survey shows that many see a bright future for golf

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A renovation-redefining revelation

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"My LASIK-enhanced eyes took in a lot of amazing sights in 2019. Here are the top six things I saw."

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

Best sights of 2019

It only took one month into 2020, and I went ahead and used the "2020 vision" pun on the cover. If I'm not going to be original, at least I'll be first out of the gate, I suppose.

I'm happy that I have better than 20/20 vision, thanks to LASIK surgery about seven years ago. How good is my vision? I tell my kids that it's so good I can see them from my office while they're in school. I'd recommend LASIK to anyone who struggles with nearsighted vision. It's great being able to follow the golf ball after its been smashed off Dustin Johnson's driver while your friends lose it off the club face.

My LASIK-enhanced eyes took in a lot of amazing sights in 2019. Here are the top six things I saw:

⑥ John Deere's autonomous fairway mower in action My friends at John Deere usually invite me to the John Deere Classic each year, but I could tell the 2019 invitation was different. They really wanted me to come

out to TPC Deere Run last year. Turns out, it was for a good reason, as this was the event that they unveiled their robotic fairway mower to a small group of superintendents. It's exciting to see these new innovations up close.

⑤ The Rocky Mountains in Banff, Alberta It was my first Canadian Golf Superintendents Association's Golf Course Management Conference, and it was a winner — the views of Mt. Rundle and Mt. Cascade were a sight to behold. I'm happy to see we made some friends in Canada while we were there, too. My sense of sight was pleased, but so was my sense of taste — at Banff Ave Brewing Co., a brewery to which I hope someday to return.

④ Evey leading her team in scoring Warning, dad brag ahead. It was fun watching

my 13-year-old daughter lead her seventh grade junior varsity basketball team in scoring on several occasions. Oh, her point totals in those games? 4, 2, 1, 4, 2 and 2. I should mention that in the game in which she scored 1 point, she actually *tied* for leading scorer with another girl. Yes, two free throws were the only points put on the board. Yes, it was a long season. But there's something exciting about breaking a shutout in the last minute of a basketball game.

③ The greens at East Lake GC August in Atlanta is hot, but it's a good time for those bermudagrass greens. I was able to get in early for the TOUR Championship and get a close-up look at the greens before the fans were allowed on the course. Rory McIlroy wasn't the only winner at

East Lake ... Ralph Kepple, Charles Aubry and the crew also scored a big win with the 2019 TOUR Championship.

② Cypress Point and Pebble Beach Talk about a good day ... I went out early to visit the crew at Pebble Beach for our cover story on the 2019 U.S. Open. I got to watch the sun rise at Pebble Beach, and after taking in those views, I made the short drive to Cypress Point and watched the sun set on that course. That, my friends, is a very good day.

① Changing of the Guard at the Tomb of the Unknown Soldier I was in D.C. for an event hosted by the National Association of Landscape Professionals called Renewal and Remembrance. It's similar to National Golf Day but different in that this group volunteers at Arlington National Cemetery to spruce up the grounds there. While there, I saw the guard at the Tomb of the Unknown Soldier. It was hot out, and I was about to move when my publisher, Bill Roddy, advised me to stay for the changing of the guard. Seeing this ceremony in person — the precision, the dedication, the gravitas — made me proud to be an American. I hope someday to take my kids there to see it in person themselves.

I'm excited to see what visions 2020 brings to my 20/15 eyes. Happy New Year to you all. **⑥**

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Starter

NEWS, NOTES AND QUOTES



// HONORS FROM TIME AT THE HONORS COURSE

STONE, THE LEGEND

TENNESSEE GOLF HALL OF FAMER DAVID STONE TO BE HONORED AT 2020 GIS

BY SETH JONES // Editor-in-Chief



David Stone is a member of the Tennessee Golf Hall of Fame, and he's a recipient of the USGA's Green Section Award. Now, he's also a verified Legend.

That's according to Anuvia Plant Nutrients, which began the Legends Initiative three years ago. Stone, long-time superintendent at The Honors Course, Chattanooga, Tenn., joins previous recipients Bob Farren, Pinehurst Resort; Ted Horton, BrightView Golf Course Maintenance/retired, Pebble Beach; Marsh Benson, retired, Augusta National Golf Club; and Matt Shaffer, retired, Merion Golf Club.

Stone's leadership at Tennessee's famed Honors Course is recognized throughout the golf industry. While there, he was responsible for running extensive control experiments to successfully change the fairways from bermudagrass to zoysia. During his tenure, the Honors Course hosted five USGA events and a young Tiger Woods at the 1996 NCAA tournament.

"David is the perfect blend of scientist and artist," says Damon Di Giorgio, superintendent at Playa Grande GC in the Dominican Republic. Di Giorgio fondly recalls his year spent living on



David Stone (left) saw his former intern Damon Di Giorgio, along with his dog Pinki, while on a recent trip to the Dominican Republic.

the golf course at The Honors, intern-ing under Stone and learning from the master. "He focuses on the reason why an agronomic practice is being done, all the while making sure the golf course is playing its best."

Stone, who has been retired for three years, says he was surprised to receive the phone call from Matt Shaffer telling him of the honor. He credits his success to his curiosity about turfgrass and the people with whom he surrounded himself.

"I was always interested in the grass-growing aspect, continually trying to make it better," Stone says. "And I always tried to hire good, smart people ... they made me look good."

// REGISTRATION GRANTED

EPA GRANTS REGISTRATION TO RAYORA

FMC Professional Solutions' Rayora fungicide has been granted U.S. Environmental Protection Agency (EPA) registration.

This new solution is a systemic demethylation inhibitor (DMI) fungicide designed to prevent and cure dollar spot while providing a layer of added protection from brown patch until additional fungicide applications need to be made. With its active ingredient, flutriafol, Rayora fungicide moves rapidly into green tissue via translaminar and xylem movement, according to FMC.

"Rayora fungicide provides golf course superintendents, operators and managers inside-out protection and curative activity on diseases that can have a significant impact on their fairways and tees," said Mike Sisti, FMC golf and lawn care market manager. "This is an exciting chapter for FMC as we continue to develop and deliver innovative fungicide technology."

// GROWMARK GROWS

SOLU-CAL USA JOINS GROWMARK FS

Growmark FS purchased Solu-Cal USA, a supplier of enhanced calcium products in the turf care industry.

Solu-Cal will continue to operate as an independent brand within the Growmark System as part of the Growmark FS agronomy subsidiary based in Delaware. The company's operations will be managed from the new parent company's turf operations center in East Berlin, Pa. Growmark FS has long been a manufacturing facility for Solu-Cal and will continue to produce Solu-Cal-branded and private label products at its Pennsylvania production location.

"For years, our close manufacturing partnership with Solu-Cal has built a reputation for quality turf care products and exceptional customer service," said Jeff Price, general manager of Growmark FS. "This acquisition provides an opportunity to elevate that service to a whole new level of efficiency and product selection."

// LESSONS LEARNED

2019 SBI provides lessons, fosters friendships

BY CHRISTINA HERRICK // Editor

➔ Superintendents have been coming to Winston-Salem, N.C., to attend the Syngenta Business Institute (SBI) for more than a decade.

From Dec. 4-6, 26 attendees participated in three days of sessions on topics such as work-life balance, communication, negotiating and accounting.

"One of the most important lessons that I learned, and something I will implement in my daily plan going forward, is communicating effectively with my staff," said Michael Gracie, superintendent of Redlands Country Club in Redlands, Calif.

For Dave Marach, superintendent of NorthBrook Golf and Grill in Luxemburg, Wis., a session on leadership among different cultures and generations hit home.

"Since I am Generation X, it helped me understand how to get the other

generations involved, work together and retain them as employees," he said. "It taught me what is important to (millennials) and how to connect with their needs, yet accomplish what we need to get done on a daily, weekly, monthly and seasonal basis."

Another highlight of the SBI experience was the number of friendships created and developed among attendees.

"I met so many people that I know I will continue to be in contact with for years to come. The camaraderie during — and especially after — the sessions, initiated some great conversations," said Jason Zimmerman, CGCS, director of greens and grounds at Pelican's Nest Golf Club in Bonita Springs, Fla.

Gracie says "I would push any superintendent to apply for SBI. ...You will walk away a better superintendent."



EMAILS @ TEXTS # TWEETS

TURF MD AND ASSISTANT LIVING KUDOS

Karl,
Nice article in *Golfdom* ("7Up and the early buying season," November 2019). Here is my collection of one bottle found here at Martindale. Our course dates to 1921. I found it out picking up litter in the woods.



Contains 7 oz. ... no wonder why kids used to be all so skinny! Thanks for the interesting and insightful article. I have always enjoyed your writing, technical and otherwise.

— **Scott Cybulski, CGCS**
Martindale CC, Auburn, Maine

Matt,
I really enjoyed your article in *Golfdom* this month, "5 things your greenkeeper is thinking (but not saying)," (October 2019). After reading it, I was hoping you'd have a few more pages to entertain me. Keep up the great writing.

— **Matt Taylor, CGCS**
Royal Poinciana GC, Naples, Fla.

// PROVOST FOR PREZ

RISE APPOINTS NEW PRESIDENT

The governing board of RISE (Responsible Industry for a Sound Environment) has appointed Megan Provost as the association's new president.

"I welcome the opportunity to lead RISE during a time of great opportunities as well as challenges. I am honored to have been selected to lead the outstanding RISE team, to serve its diverse membership and to tell the specialty pesticide and fertilizer industry's important story," Provost said.

Provost brings a strong background in national-level pesticide industry advocacy and nonprofit leadership to the role. She joined RISE on Dec. 16.



Conversations generated during roundtable breakout sessions were a highlight for Syngenta Business Institute attendees.

PHOTOS BY: CHRISTINA HERRICK (RIGHT), COURTESY OF: SCOTT CYBULSKI (BOTTLE)

Golfdom Gallery



1 The newest Topgolf The *Golfdom* team was invited to the grand opening of the newest Topgolf, located in the Cleveland suburb of Independence. (Left to right) Craig MacGregor, Bill Roddy, Abby Hart and Jake Goodman got in some swings in December, a rarity in Cleveland.



2 All about business *Golfdom* Editor Christina Herrick (second from left) attended the Syngenta Business Institute (SBI). She posed for a photo with Mark LaFleur (left) and Stephanie Schwenke of Syngenta and Ken Middaugh (right), faculty director of SBI.



3 'Tis the season To celebrate another fun year of creating 12 issues of *Golfdom*, the editorial and sales teams took time out of their schedules to celebrate 2019 at Masthead, a local journalism-themed brewery.

4 Class of 2019 The members of SBI's class of 2019 gathered for a quick group shot in between sessions on topics such as work-life balance, communication, negotiating and accounting at the picturesque Graylyn Estate in Winston-Salem, N.C.





"Other than purchasing my Christmas list from my couch, it feels like there have been no major leaps since we left the moon and found the Titanic. After humans reached those lofty goals, we peaked."

ALAN FITZGERALD, *superintendent, LedgeRock GC, Mohnton, Pa.*

Peak maintenance

Looking back over the last 150 years, it's amazing to see how far humanity has come since the start of the Industrial Revolution, from transportation innovations of the 20th century that shrunk the planet, to space travel and the computer age.

However, even considering those advancements, it feels like nothing major has happened since Al Gore invented the internet in the '90s, except for the rise of social media, which easily is dismissed as the way we live rather than an invention.

Other than purchasing my Christmas list from my couch, it feels like there have been no major leaps since we left the moon and found the Titanic. After humans reached those lofty goals, we peaked. We now seem to be honing past achievements by making things better, more efficient and cheaper. The world, though, has become more conscious of the environment, which now is driving the latest big changes, whether you believe in climate change or not. You know change is coming when Ford launches an electric Mustang SUV!

But this got me thinking. How does all this compare to advances in golf course management?

Our industry has advanced along with the world, going from horse-drawn mowers and dragging hoses late at night with a six-pack of Old Milwaukee, to the nearly six-figure hybrid fairway mowers and irrigation systems we control from anywhere with a Wi-Fi or cell signal.

But what about turf? Have we reached the peak of maintaining turf in traditional ways? Everything we do today has its origins in Old Tom Morris' practices in Scotland more than 100 years ago, honed to the perfect conditions required today by our employers/members/customers.

We currently are reaching peak greenkeeping in the traditional sense, where

we attain standards solely by human input. How much faster can greens get? I'm sure some superintendents in the early '80s laughed and said, "Ha! We've peaked, there's no way daily speeds will go over 11 feet!" Yet here we are.

The level of maintenance today is in another league from 30 years ago. While there is potential for greens to get faster, will it be fair? We are reaching the maximum potential of what we can achieve within the resource limitations currently available to us and golf courses.

So, have we peaked? Are we reaching the upper limits of perfection? The human drive to deliver a better product has delivered progress, and we are looking to technology to advance what we can do. Over the last 10 years, the amount of tech — including moisture meters and drones — has

increased exponentially. Are we reaching the peak of traditional greenkeeping and starting the switch to where the human element will be reduced in turf management?

For daily operations, robots can take care of mundane tasks like hand-mowing greens with a cold precision never achieved by the best humans, let alone a half-asleep, hungover human at 6 a.m. The machines will need some supervision but will overall free up labor for more detailed tasks, which will probably net the biggest gains, assuming staffing levels are not curtailed too much because of the robotic mower.

However, computers lack critical thinking, especially when dealing with an uncontrollable factor such as Mother Nature, so the need for human interpretation still will be essential. The information stream available to the superintendent will help him or her make better decisions and ensure the best use of resources, which ultimately will benefit the environment and the bottom line.

Thirty years from now, turf managers will read this and wonder why staff were walking off hangovers at 6 a.m. and will be amazed at how their fairways are cut at 2020 greens height, the quaint green speeds of only 12 feet and why Old Milwaukee was ever needed to water anything. Maybe we have not reached peak greenkeeping after all. **G**

Alan Fitzgerald (alan@ledgerockgolf.com) is superintendent at LedgeRock GC in Mohnton, Pa.

The Golfdom

FILES

FROM THE ARCHIVE

Maintenance budgets always are a fun topic, said no one ever. What is fun is seeing what maintenance budgets were between the early 1930s and the mid-1960s. It's safe to say they were a bit lower in those days, with course expenses at one Midwestern course in 1937-38 hovering around \$12,600 on average. Looking to the present, according to *Golfdom's* annual State of the Industry survey, from 2019 to 2020, the majority of budgets are expected to stay the same (52 percent) or rise (39 percent). And it's probably a safe bet that they're a little higher than \$12,000. To read the full version of the article below, visit golfdom.com/exclusive.

Course maintenance costs compared over a 26-year period

BY HERB GRAFFIS

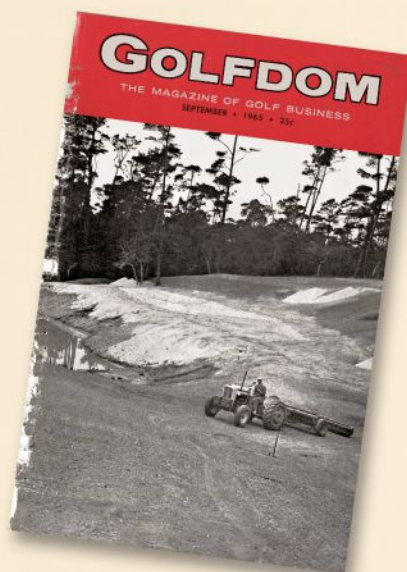
The figures tell the story of what has happened in golf course management. Maybe they also point to what is going to happen." This reflection of a superintendent of a prominent Midwestern metropolitan district club was made as he went over his annual operating costs from 1937-38 through the club's fiscal year, November 1963 through October 1964.

In the 20 years reviewed, maintenance costs of the course ranged from \$12,600 to \$69,000. Both figures are exclusive of the superintendent's salary.

Budgets and actual figures, and various notations on the various annual reports, show that the superintendent generally has had understanding and cooperative green chairmen. It also is evident that the club has had a most resourceful and dedicated superintendent, as his performance in the lean years of the late '30s and during World War II plainly reflect an able man doing the work of three.

SUPERINTENDENT NEVER GOT "FAT"

During the Depression and war years, the



superintendent took a cut in a salary that had been \$2,400 a year. That sum is less than what is now paid for labor in December, when a foresighted work program keeps key men busy in an off month.

The labor portion (exclusive of the superintendent's salary) of 1937-38 maintenance costs was 43 percent. For 1962-63, labor costs (not including the superintendent's salary) ran to approximately 64 percent.


August was the big month for labor cost in 1938, amounting to \$1,200. August also was the top labor cost month of 1963 at \$5,200. The low month for wages in 1937 was November, when \$150 was paid out. The December 1962 payroll was lowest of the fiscal year at \$2,500. The jump in winter costs over 25 years is accounted for not only by the increase from approximately 50 cents an hour to \$1.95 per hour in the wage rate, but also the necessity of a winter work schedule enabling the club to keep good men steadily employed cleaning, repairing and painting equipment.

SHOW WHERE MONEY GOES

In the earlier reports, "grounds," "tennis" and "landscape" were separately listed. Now, all outside work except on the clubhouse and pool is included in the maintenance expense roundup.

Items reported in the 1937-38 maintenance expense summary: labor, fertilizer, seed, disinfectant (now listed as fungicides, herbicides, etc.), equipment maintenance, equipment repair, electricity, water, phone (\$75 a year), ice (\$100 May through September) gas and oil and sand.

DIDN'T WORK OUT

Going back beyond the period mentioned here, the 1931-32 budget showed a venture in theory that can be laughed at now but was a headache then. The greenkeeper's salary was cut and a "turf expert" at \$50 a month was engaged. The "expert" did not perform expected miracles. The greenkeeper had to work long hours at backbreaking labor. The next year, the club decided its own man was the "expert" it needed. So, he got his pay cut restored and the "expert" went elsewhere. 



"When you really think about what meteorologists do, it's frankly amazing that they're right as often as they are."

MATT NEFF, assistant superintendent,
Wedgewood G&CC, Powell, Ohio

How 'bout this weather?

According to the great Bob Dylan, "You don't need a weatherman to know which way the wind blows." Hot take alert — Bob was not a superintendent and was almost certainly not talking about actual weather, but A), I'm not intelligent or motivated enough to figure out what he actually meant, and B), I needed a catchy opening line related to weather.

While it doesn't take a genius to discern current weather conditions, we're more interested in which way the wind will be blowing a week in advance (along with all the other weather data we need). With apologies to the great Mr. Dylan, that does, in fact, take a weatherman.

Almost everyone reading this (so six of my seven readers — mainly family members) just said something along the lines of, "Too bad they're never right," or "I wish I could be wrong all the time and still keep my job." We love to trash meteorologists in this business, don't we? Maybe we should cut them a bit of a break. After all, as members of an often-misunderstood profession ourselves, it's the least we can do for the members of a similarly misunderstood

profession.

When you think about what meteorologists do, it's frankly amazing that they're right as often as they are. They are essentially trying to predict the behavior of the Earth's atmosphere and how those behaviors will combine and interact with each other to create weather.

Our atmosphere always is in flux. It's constantly changing based upon the interactions of temperature, pressure and moisture gradients and numerous other variables — both known and unknown — so meteorologists are, more or less, trying to hit a moving target every day.

Our atmosphere is composed of billions of molecules. To forecast with 100-percent accuracy 100 percent of the time, meteorologists would

need a complete understanding of how all of these molecules are behaving, and all the variables that could affect that behavior. They also would need to measure all that with absolute accuracy all the time.

Remember the old true/false test-taking adage? More often than not, statements that contain "always" or "never" frequently are false because there simply aren't a lot of absolutes in life. In other words, we have little — if any — completely perfect knowledge of anything in the universe. Meteorology is no exception.

Despite this, the weatherman seems to do pretty well. According to the National Oceanic and Atmospheric Administration, a seven-day forecast can predict the weather correctly 80 percent of the

time, and a five-day is correct 90 percent of the time.

I know what you're thinking right now. "Of course the government agency in charge of forecasting the weather would say they're killing it."

Be paranoid all you want. Who's ever heard of a government agency spinning facts to validate their own existence? No way ... never happens, especially with the well-oiled machine in Washington right now.

The main problem we have with weather forecasts is the result of how we consume the information. No matter the source, when we see a forecast, we expect nothing less than 100-percent accuracy and 100-percent precision, which simply isn't possible when you're dealing with something as massive and complex as the Earth's atmosphere.

We further compound this by relying on weather apps for our information. Keep in mind that apps are electronic resources that are automatically updated whenever the models that are used as their data source are run. There's likely little-to-no human intelligence — and therefore no experienced analysis — involved with the updates, so it would follow the accuracy might not always be what we'd hope.

We make our livings trying to achieve perfection despite the curveballs Mother Nature throws our way. No one understands that more than a meteorologist. **G**

Matt Neff (mneff4@yahoo.com) is assistant superintendent at Wedgewood G&CC in Powell, Ohio.

Rayora: Effective disease control, exceptional turf

The new DMI fungicide protects turf from a variety of diseases, including dollar spot and brown patch

FMC Corp. will present its latest product, Rayora, at the Golf Industry Show. Featuring one active ingredient, flutriafol, Rayora is a highly systemic sterol biosynthesis inhibitor fungicide (commonly classified as a DMI fungicide) with preventive and early curative control of key turfgrass diseases.

Rayora can be rapidly translocated through turfgrass via leaves and roots. Furthermore, it disrupts the demethylation of key enzymes in fungal cells, which inhibits the sterol biosynthesis of ergosterol.

"Ergosterol is crucial to cell membrane development in fungi," says Ken Hutto, Ph.D., FMC Corp. product development manager. "The loss of ergosterol results in cell membrane leakage, which greatly impacts fungal cell growth."



Ken Hutto

Multiple research trials were conducted at universities across the United States, including North Carolina State University and Ohio State University. During the trials, Rayora demonstrated control on several diseases, including dollar spot, brown patch, summer patch, spring dead spot and gray leaf spot.

Golf course superintendents also have



A metropolitan Philadelphia course recently trialed Rayora, the latest fungicide from FMC Corp., on its creeping bentgrass tees.

overseen trials at their courses, including a superintendent currently at a course in the metropolitan Philadelphia area.

Throughout this particular trial, which began Aug. 30, the superintendent oversaw three applications done at two-week intervals. The primary focus was dollar spot on a creeping bentgrass tee box. The superintendent created four plots, one with an application rate of 1.4 fluid ounces of Rayora per 1,000 square feet, one with a one-time spray of Rayora, one with a post-patent tebuconazole application and an untreated control plot.

No dollar spot lesions appeared on the

plot with 1.4 fluid ounces per 1,000 square feet of Rayora, and turf quality remained exceptional. The superintendent observed no phytotoxicity and was pleased with the results, particularly since DMI fungicides usually injure turfgrass when sprayed at elevated temperatures during the summer.

"Rayora offers a wide range of uses on creeping bentgrass fairways, along with ultradwarf bermudagrass greens," explains Hutto. "Not only has it demonstrated effective preventive and early curative dollar spot control, it has also provided effective control against other turf diseases golf course superintendents commonly face."

As the superintendent of the metropolitan-Philadelphia-based golf course looks ahead, he notes Rayora likely will become a part of his chemical program long term. The value of the DMI fungicide is simply too significant to ignore.



The control plot at a Philadelphia course (left) shows signs of dollar spot, while a plot treated with Rayora (right), two weeks after application, is clear of the disease.

HELLO RAYORA™ FUNGICIDE.

Goodbye dollar spot.

Say hello to a newly discovered active ingredient that provides preventative and curative control of Dollar Spot, plus a first defense against Brown Patch. Rayora™ fungicide moves through treated plant surfaces to provide rapid action that keeps working even after the plant is cut, continually protecting new growth and maintaining turf safety.

Be your local GCSAA chapter champion by visiting booth 3913 to learn more about Rayora fungicide and take a swing to help FMC support your local GCSAA chapter.

We can't wait to say hello.

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FMC

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The background of the page features three large, stylized, overlapping numbers: a purple '2' on the left, a blue '0' in the center, and a pink '2' on the right. These numbers are rendered in a thick, rounded font style.

VISION

2

While no one has perfect 20/20 vision for what the future holds, our annual survey shows that many see a bright future for golf

BY SETH JONES AND CLARA MCHUGH

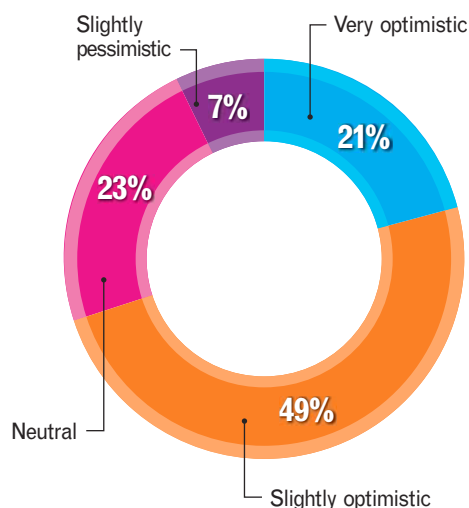
The beginning of a new decade sparks nostalgia for some, while at *Golfdom*, we're eager to look to the future.

In December 2019, we surveyed our readers on various topics, from their expectations for 2020 to their opinions on robot mowers and social media use. We learned that labor is still the No. 1 concern for readers and that only 15 percent of respondents saw rounds decline at their facilities. We also got a wildly diverse response to our question regarding President Donald Trump's performance (see page 21), but most readers believe overall, he's shot par or better over the last three years.

The Carolinas GCSA chapter returned the most surveys this year — we look forward to visiting an event in the Carolinas in 2020 and thanking chapter members for the support. And congratulations to Michael Ponsler at Jaycee's Public Golf Club in Zanesville, Ohio, and Chris Tierney at The Omni Grove Park Inn in Asheville, N.C., for being our two randomly drawn winners of \$100 gift cards.

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What are your expectations for the golf economy in 2020?



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CORRECTING COURSE

Optimism is high but so are expectations for course conditions

When it comes to optimism, the respondents to our survey have a lot of it. When asked for their view on the golf economy in 2020, 70 percent (21 percent “very optimistic” and 49 percent “slightly optimistic”) were positive about golf’s outlook headed into 2020.

“I think we’re going to see continued correction,” says Alex J. Stuedemann, CGCS, director of golf course maintenance operations at TPC Deere Run in East Moline, Ill. “I think we’re going to still see golf courses close, but I also see other golf courses doing renovations, improving their product, improving their customer service offerings.”

Matt Cavanaugh, assistant superintendent at Rush Creek Golf Club in Maple Grove, Minn., expects that 2020 will be a good year for golf in his home state. He says he doesn’t have a bleak outlook on the economy, and despite some course closures in his area, people are still looking to play the game. His facility, a high-end public resort, is packed with golfers when the weather is nice, despite a lofty price tag (\$119 green fees on weekends).

“Closures are never good, but not every club can be viable,” he says. “Some needed to go away, and I think it’s been good for the industry.”

Now, he says, the struggle is to manage golfer expectations when the courses are getting so much play.

Many expect the golf industry to hold steady in the coming year, neither predicting wild success nor disappointing failure. 2019 Herb Graffis Businessperson of the Year Award winner Alan FitzGerald, superintendent at LedgeRock Golf Club in Mohnton, Pa., says

he expects the industry to keep doing what it’s doing. “In the long term,” he says, “I think

that golf is just settling into what it needs to be, and once it reaches that point, it’ll be successful.”

Some expressed concern that not enough young people are getting into golf because of public course closures.



Alan FitzGerald

“I hope that between the PGA, GCSAA and the USGA, we get back to leaning on the municipalities and the county golf courses,” says Tim Johnson, superintendent at Spring Hill Golf Club in Wayzata, Minn., who expresses concerns that courses are still too expensive for young people.

Michael Heustis is hopeful that courses will continue to do more to attract golfers of any age and skill level. He is optimistic that it will drive the economy of golf in the right direction.

Weather — always the unknown factor — could determine how 2020 shapes up, and superintendents are aware of it. Mother Nature was a beast in 2019, and some superintendents expressed concern that 2020 could have more unpredictable weather in store.

Steve Cohoon, CGCS at Raspberry Golf Management, a golf course consulting firm based in Leesburg, Va., says he hopes this year will be better, because the weather was all over the place in 2019. “Weather changes, and the climate changes,” he says. “We’ve had more rain followed by more drought, which impacts play.”



Steve Cohoon

Despite concerns about the weather, Cohoon is another one of the optimists in the industry. He says that if Mother Nature cooperates in 2020, courses will attract even more play.



Michael Heustis

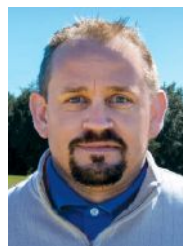


“Things will remain the same. A lot of people want to play golf and spend money because the economy is good.”

MATT SCHULT
Seattle GC



Matt Cavanaugh



Alex Stuedemann

Continued on page 20



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MOTHER OF ALL CHALLENGES

Superintendents continue to face the revolving door of labor



“I’ve already got one robot on my golf course, and I’m looking to get one or two more. It’s the best.”

SCOTT RAMSAY, CGCS
Yale GC, Middletown, Conn.

We asked in our survey the open-ended question, “What is your biggest concern going into 2020?” The responses were varied, from weather to aging equipment and memberships, but the most common answer by far was keeping a full crew.

“Labor, labor, labor,” wrote one survey taker, who also said, “We managed to survive last year and had a successful year by working the crew more hours to make up for a lack of employees, but that is not going to fly again this year. We know we burned out our guys this year, and we apologized to them many times. We are going to need to figure out how to increase our staff levels, because a lesser-conditioned course is not an option.”

Jason Hollen, superintendent at Stonewall Resort in Roanoke, W.Va., says that keeping a full staff is the “mother of all challenges” at his facility.

“It’s the No. 1 thing that makes it tough for the job that we want to do,” he says. “I have gone to the point as far as splitting a 40-hour



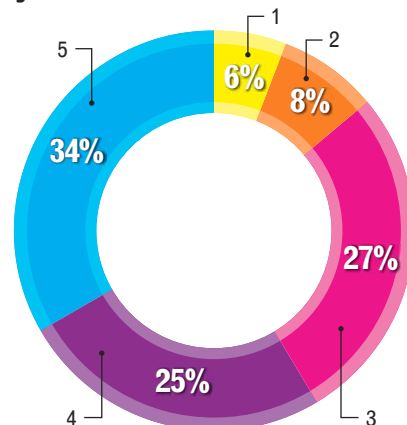
Jason Hollen

position with two folks who will both do 20 hours. I’m always looking for something new to get more people in there so I can fill these positions.”

Mike Valiant, CGCS, and his crew at Glenwild Golf Club & Spa in Park City, Utah, maintain a Tom Fazio course that *Golf Digest* recognized as the “Best in Utah.” While the club is well known in Utah, behind the scenes, keeping the crew at full staff has been a nightmare based on its location in a resort community.

“We have to retrain a new staff every year. I feel like if I can get three years out of a guy, I’m doing pretty good,” Valiant says. “You have to be very flexible and treat your crew with kid gloves, because, ‘Hey, I need tomorrow off.’ Well, we have a tournament, but OK — try coming back the next day. A lot of guys go on

On a scale of 1 to 5 (1 = easy, 5 = difficult), how hard is it to maintain a full crew at your course?



to other jobs. It’s tough; it’s a tough market.”

Duane Sander, CGCS at Shoal Creek GC in Kansas City, Mo., agrees that the shelf life of a good crew member is only a few years before that person leaves for a better-paying job.

“I’ve groomed kids up from high school, they’ll stay with me four or five years, and the next thing you know, they get poached,” he says. “You have a good guy, but someone else needs an assistant or a second assistant ... but it’s OK, we network and try to help each other out. I just wish I could pay them more to get more qualified experience.”



Duane Sander

The Bureau of Labor Statistics recently reported the U.S. unemployment rate fell to 3.5 percent, a 50-year low. Indeed, the only superintendent we talked to who didn’t bemoan the current effort it takes to keep a full crew is based outside America’s borders.

Chip Caswell, superintendent at Santa Maria Golf Club in Panama City, Panama, has worked as a superintendent in both the United States



Chip Caswell

and Latin America. He says the labor problem in the golf industry is unique to America. “It’s hard to find people (to work) in the U.S. In Latin America, it’s not,” he says. “I have no issues with labor.”

MOWERS CRAWLING OUT LIKE CRABS

Superintendents show an interest in robotics

Just above 50 percent of superintendents who responded to the survey are curious to try robotic mowers at some point, while 20 percent never want to turn to our robotic overlords, and 28 percent want to try it now.

Tim Davis, superintendent at Legacy Ridge Golf Course in Westminster, Colo., is one such superintendent.



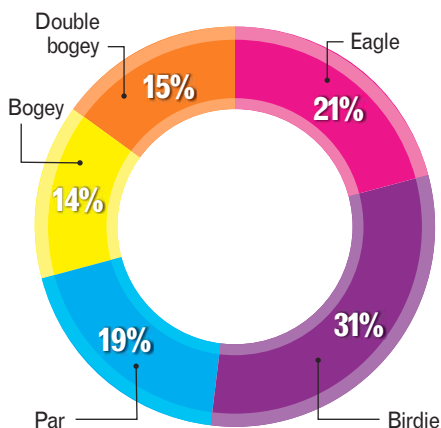
Tim Davis

"I love what these companies are doing right now," he says. "I wish I could jump in right now, but I'll wait a couple more years. It's coming, for sure. I think it'll happen in my lifetime when I sit at my desk, kick my feet up, hit a button, the doors go up and the mowers crawl out like crabs."

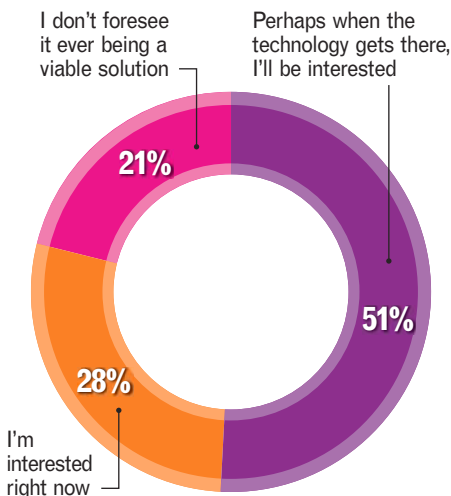
Cavanaugh, on the other hand, would be happy to welcome robots to his course as soon as today. He believes robotic mowers would give him the opportunity to maintain Rush Creek's par-3 course without having to take workers away from other parts of the facility that may need more urgent attention.

"We have a par-3 course that is really hard for us to maintain," he explains. "The championship course always gets precedent, and we always seem to run out of time to get to the short course."

Now that we're approaching an election year, how would you rate President Donald Trump's performance if it were a golf score?



With labor being a constant struggle in the industry, where do you stand on robotic mower technology as a potential solution?



Not everyone shares Davis' and Cavanaugh's opinions about the future of robotic technology on the golf course, however. Though interested, some superintendents show apprehension about their ability to reduce labor, as well as what they could do for the future of certain golf courses.

"I'm interested to see where it goes," Hollen says. "I think we're headed that way, definitely. Will it be the final answer? I think it'll be a combination. You still have to have people who can operate the robots at this time."

Charles Aubry, superintendent at East Lake Country Club in Atlanta, host course of the Tour Championship, echoes that sentiment.



Charles Aubry

He worries that courses will end up spending more money on labor when they have to hire a mechanic who can work on the machines. He also expresses some concerns about what the machinery could do to the industry as a whole.

"I think robotics are going to separate the industry a little bit more," he says. "The people who can afford them are going to use them ... you're almost going to see a larger separation in middle- and lower-level clubs from the upper-level clubs."

Continued on page 22



"I don't know that it will be a solution to the labor problem. I think we're going to have to dig in deeper."

JOHN CUNNINGHAM, CGCS
Aronimink GC, Newtown Square, Pa.



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2020 VISION

Continued from page 21

Atlanta Athletic Club Equipment Manager John Patterson agrees, saying that they might serve to separate the haves from the have-nots.

INTO THE TWITTERVERSE

Readers rely on social media as a “global roundtable”

A handful of superintendents who took the survey — 26 percent — aren’t using any form of social media, and while some are on Facebook (43 percent) or just have a blog (16 percent), Twitter reigns supreme as the social media channel of choice.

Fifty-one percent of respondents to the survey are on Twitter. And while some are active users, not everyone is tweeting all the time.

“I use Twitter for work. I don’t tweet too much, but I gather information and pick up ideas from other folks,” says Drew Barnett, superintendent at Knollwood Club in Lake Forest, Ill.

Using Twitter not to tweet but rather to keep an eye on what other superintendents and industry professionals are doing seems to be a common theme.

Chris Cook, superintendent at Bailey Ranch Golf Club in Owasso, Okla., refers to

“I use Twitter for work. I don’t tweet too much, but I gather information and pick up ideas from other folks.”

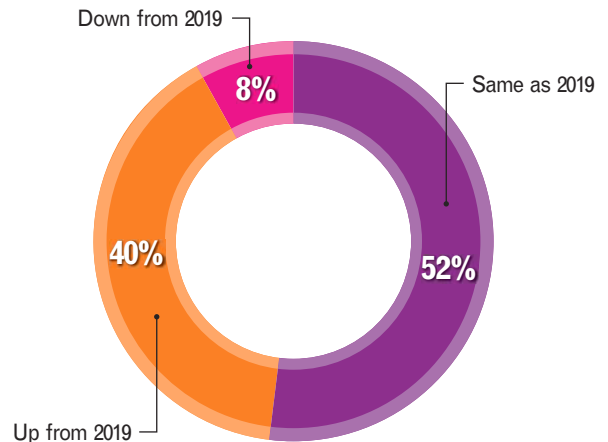
DREW BARNETT

Knollwood Club, Lake Forest, Ill.

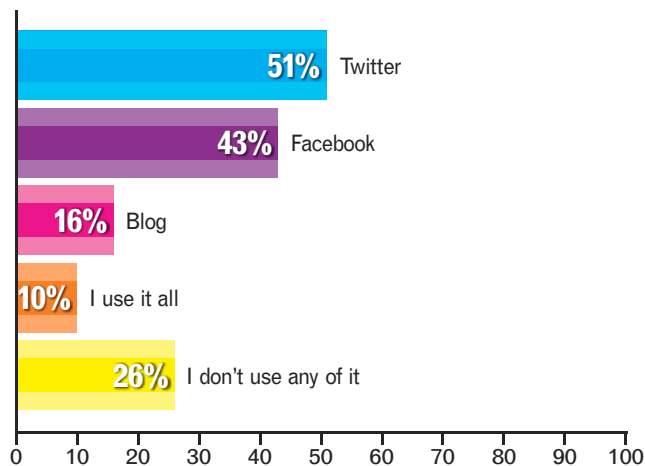


Chris Cook

What does your maintenance budget look like for 2020?



What forms of social media do you use for work?



Twitter as a giant global coffee roundtable where industry professionals can talk shop. "I learn something every day I get on there," he says. He encourages his assistants and the rest of his staff to get on Twitter to learn what other turf professionals are up to.

Even superintendents who avoid Twitter to make sure they don't say something they can't take back turn to the social media channel for valuable information.

Both Matt Schuldt, superintendent at Seattle Golf Club, and Kevin Banks, superintendent of Vineyard Golf Club in Edgartown, Mass., try not to use social media for work too much ("Just so I don't get myself in trouble," Banks says), but like to use Twitter to see what others are up to at their courses.

"I love Twitter to learn what other people in my industry are doing," Banks says.

"Whether its following Frank Rossi at Cornell, magazines like *Golfdom*, other superintendents and even sports turf managers or (agriculture) guys, where I can relate what they do to what we do. So, it's more of a learning hub than anything else for me."




Kevin Banks



Steven Friedell

Cook also blogs for his members, something Steven Friedell of North Hills Country Club in Glenside, Pa., Steve Sarro of Pinehurst Country Club in Denver, Colo., and roughly 25 percent of superintendents who responded to the *Golfdom* survey are doing.

"The blog is more for in-house customers," Cook says. "It's more long form, so if I'm describing a project or something like that, I really enjoy the format." 



Steve Sarro



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// A GAME-CHANGER FOR SUPERINTENDENTS?

A renovation-rede

GPS technology helped Crandon Golf at Key Biscayne determine which areas were ideal for turf removal.

**USGA's
“heat-mapping”
technology helps
superintendents make
data-driven decisions
about agronomic projects**

fining revelation

BY SHANE SHARP

GPS technology has thousands of uses, the most basic of which is tracking movement. How golfers move around a course — or fail to — helps or hinders pace of play. If you can track patterns, uncover bottlenecks and address them, you can significantly whittle down a 4.5-hour round.

That was the USGA's hypothesis in rolling out a series of tests in 2014 using GPS “loggers” placed on golfers at 135 courses around the country. The USB-drive-sized devices fit easily in pants pockets and recorded a golf-

er's position every five seconds. Interns stationed at the first tees of select courses collected additional demographic and player-ability information to help calibrate the results.

As the USGA expected, the data haul was robust, and the output was eye-opening. USGA overlaid movement patterns with myriad other layers, such as green speeds, rough heights and bunker locations. Operators could then visualize how setup and design impact “flow rate” — how fast golfers move through a course.

Continued on page 26

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What the USGA hadn't anticipated was the emergence of an alternative application of the technology that would be a game-changer for superintendents.

"We pride ourselves on looking at things from different angles, and the shift to



Scott Mingay

agronomy occurred with [retired Green Section Director] Jim Moore," says Scott Mingay, USGA director of product development. "Jim had a passion for water use and educating courses about conservation. He had a vision of putting this to use to help courses make data-driven decisions about water conservation and turf removal."

In 2017, the USGA unveiled what it dubbed the "Facility Tool" to superintendents to glean feedback on agronomic uses. While operators benefited from its ability to generate flow rates for pace-of-play analysis, the tool's "heat-mapping" feature emerged as the change agent for

▼ **The team at Fox Hollow Links used the USGA Facility Tool to remove one of two bunkers on the course's ninth hole.**

IN 2017, THE USGA UNVEILED WHAT IT DUBBED THE 'FACILITY TOOL' TO SUPERINTENDENTS TO GLEAN FEEDBACK ... THE TOOL'S HEAT-MAPPING FEATURE EMERGED AS THE CHANGE AGENT FOR COURSE MAINTENANCE AND RENOVATION.

course maintenance and renovation.

The "heat" has nothing to do with temperature. Rather, it shows data values represented as colors; red is high use and blue is low use.

"Basically, we're able to highlight areas where golfers don't walk, drive carts or hit shots," Mingay says. "We can either present the results agnostically, or we can work with the course to implement recommendations based on its objectives."

Crandon's conundrum

Golf course architect John Sanford never will forget the 2018 PGA Merchandise Show in Orlando, Fla. In December 2017, he'd been retained by Miami-Dade County to identify areas of its Crandon Golf (course) at Key Biscayne that were ripe for turf removal. The 7,300-yard layout's 130 acres of bermudagrass generated a yearly \$1.1-million water bill that wasn't sustainable, resulting in substandard conditions.

Sanford caught wind of the USGA Facility Tool and arranged a meeting at the show with Mingay and Hunki Yun, USGA director of outreach, partners and education. Sanford and his team had developed an initial plan for removing 29 acres of turf and were well on their way to finalizing recommendations.

"When I saw the heat-mapping feature,



John Sanford

I thought, 'Wow, the USGA technology will really take (turf removal) to the next level,'" Sanford says. "We did our turf plan as golfers and architects, but we err on the side

of caution, because once you remove and replace it, it's gone for good."

After the meeting in Orlando, the USGA took the show on the road and deployed its GPS loggers on golfers at Crandon.

"It was genuinely a revelation," Sanford says. "I wasn't thinking we'd be able to remove more turf. I thought it would provide empirical data to validate our findings to a public entity (Miami-Dade County)."

Sanford and the USGA found an additional 13 acres of turf to be removed. The data were used to create a master plan that ultimately will save \$350,000 on water annually. The turfed areas will be converted to crushed stone, naturalized plantings and aquatic materials (along water features) in coming years.

"Any course that is paying for water and not doing this is lost," says Steve Jablonowski, region manager for golf and destinations with Miami-Dade Parks, Recreation and Open Spaces. "We are through phases 1 and 2 and have already reduced our water use by 20 percent."



PHOTO PREVIOUS PAGE COURTESY OF CRANDON GOLF AT KEY BISCAINE
PHOTO COURTESY OF FOX HOLLOW LINKS

Phases 1 and 2 entailed changes to sprinkler heads and nozzles. Phase 3, turf removal and replacement, is yet to be funded by the county. Jablonowski says it's only a matter of time, as the cost of water in Miami-Dade County continues to rise.

"It has to be done; there's no way we can keep going at this pace," he says. "Our water budget will eventually be higher than our payroll, and we can't pass the cost along to the golfer."

Fox Hollow follows suit

Fox Hollow Golf Course in Lakewood, Colo., is a high-end, 27-hole municipal course west of Denver. Superintendent Mark Krick had researched the USGA Facility Tool and was interested in leveraging the technology for an upcoming bunker renovation project.

"We were always aware of the bunkers and their impact on pace of play, but we needed the USGA to take it from subjective to objective," Krick says.



Mark Krick

He and original architect Denis Griffiths used heat maps to create a bunker renovation plan for Lakewood's three nines. They started with the ninth hole on the Links Nine, removing one of two bunkers along a small lake right of the green that golfers never hit into.

In 2018, Krick's crew removed five more bunkers; the following year, it reduced the size of a series of massive bunkers on the Meadows Nine. Krick says the results on pace of play are staggering. Golfers play the Meadow Nine 15 to 20 minutes faster and any 18-hole combination 20 to 30 minutes faster. The city also saves about \$1,000 for every bunker removed.

"I would say (that) in seven years, we'll recoup the cost," Krick says. "Not all the benefits can be measured in dollars. We're moving golfers more comfortably around the course, and they're having a better experience."

Slow and steady

The Facility Tool is effective, efficient and easy to deploy. And while the USGA doesn't publish pricing, Mingay says the organization intends to make the tool accessible and affordable. So why isn't it in wider use? According to Mingay, it's a matter of perfecting the product.

"We've had good uptake from courses over the past year," he says. "We realize technical change can be difficult, and we want to ensure the Facility Tool provides a seamless experience for course managers everywhere." **G**

Shane Sharp is a freelance writer based in Greenville, S.C.



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ON COURSE FOR ORLANDO

BY ABBY HART

The Golf Industry Show is upon us!

This year's event will be held in Orlando, Fla., from Jan. 25-30 and promises to be packed with even more resources than ever for golf course superintendents. The Golf Course Superintendents Association of America (GCSAA) Education Conference includes 103 seminars (more than half are new) and 23 free sessions.

The free seminars will include a labor track, a best management practices track, an emotional health track, a water track, a new education track and new seminars for Spanish-speaking attendees.

Before we meet again in the land that Disney built, here's a rundown of the things we're excited to see at the Orange County Convention Center.

Syngenta | Booth #2628

Syngenta's main goal for this year's show is to help superintendents thrive professionally and personally.

On the turf side, during the trade show Syngenta will introduce two new fungicides coming to the market in 2020. The company also will offer visitors an unexpected view of the science behind the company's solutions. Participants will don virtual-reality headsets and view how acibenzolar-s-methyl, the plant defense activator in Daconil Action, Heritage Action and Secure Action fungicides, helps protect turf from disease, heat and drought stress.

The company also will present the third annual Ladies Leading Turf panel discussion. Leading women in the industry will offer insights on fostering diversity within your organization and how

they've achieved success in the industry. The session will be moderated by Jan Bel Jan, ASGCA, golf course architect at Jan Bel Jan Golf Course Design. The panel will feature Cathy Harbin, owner, Pine Ridge Golf Course, Paris, Texas; Elizabeth Guertal, Ph.D., professor at Auburn University; Kayla Kipp, golf course equipment maintenance manager, Lodestone Golf Course & Fantasy Valley Golf Course, McHenry, Md.; Laurie Bland, golf maintenance manager, Miami Springs (Fla.) Golf & Country Club; and Ellen Davis, vice president, SportZmix Solutions, Waupaca Sand & Solutions.

Syngenta's Condition. Perform. Recover. campaign focuses on turf health and superintendents' personal health. Attendees can hit the pavement for the annual Health in Action 5K fun run.

To help alleviate the inconvenience of scheduling a health and wellness checkup, GIS attendees can receive a skin cancer screening at the GIS Wellness Pavilion as well as free wellness checkups, including blood pressure measurements, cholesterol screenings and glucose analyses, with a registered nurse. These will be available at the Mobile Wellness Unit in booth #2607.

Cub Cadet | Booth #4445

The Cub Cadet robotic mower has turned many heads over the last couple of years, first with an early model at the 2018 *Golfdom* Summit and then at the 2019 GIS, where the company demoed the Infinicut RGX at San Diego's Santaluz Club.

This year, in addition to the RGX, which Cub Cadet plans on bringing to market in 2020, the company is presenting its Infinicut walk-behind series of mowers. The line

offers floating or fixed-head options, variable clip rate and a customizable design that allows for quick adjustments and a more precise cut.

The Infinicut runs on a lithium battery, which means reduced noise, vibration and fuel costs.

Cub Cadet also will show the Infinicut SM34, a 34-inch rotary all-electric push mower, which can be used as a traditional mower or as a stand-alone vacuum. In cut mode, the mower uses a front roller and a rear-traction roller, delivering a striping effect usually only achieved with a professional reel mower. The premium-grade, high-carbon steel blades offer extended life and come prebalanced to exhibit less vibration.

New in 2020, select models of Infinicut mowers will offer a Bluetooth app connection that communicates with mechanics and operators to identify and quickly resolve service alerts.

"We're showing these golf turf products at GIS, and we've established a good relationship and network with our dealer partners so that they can bring (superintendents) these products wherever they are," says Tony Whelan, Cub Cadet's director, sales and marketing, golf and sports turf.





Anuvia Plant Nutrients | Booth #4800

Anuvia Plant Nutrients' Legends Initiative recognizes integrity, passion and innovation in golf course management. The company is honoring David Stone for his lifetime of innovation and achievement in the industry. Stone, retired from The Honors Course, Chattanooga, Tenn., will be honored Jan. 29.

Stone was unanimously selected by a peer-review panel of past winners and other golf course professionals. While at The Honors Course, Stone was responsible for running extensive control experiments to successfully change the fairways from bermudagrass to zoysia. During his tenure, the course hosted five USGA events and a young Tiger Woods at the 1996 NCAA tournament. Stone is the recipient of a USGA Green Section Award and is one of only two superintendents inducted into the Tennessee Golf Hall of Fame.

Stone will be joined by Legends Initiative recipients Bob Farren, Pinehurst Resort; Ted Horton, BrightView Golf Course Maintenance/retired, Pebble Beach; Marsh Benson, retired, Augusta National; and Matt Shaffer, retired, Merion Golf Club, in a conversation moderated by *Golfdom* Editor-in-Chief Seth Jones.

Arnold Palmer's Bay Hill Club & Lodge

For those superintendents who have never hosted a tournament or volunteered at one, the idea of managing the web of tournament preparations, irrigation system implementations and maintenance facility operations might seem a bit daunting.

The team at Arnold Palmer's Bay Hill Club & Lodge aims to take the mystery out of the process. During the half-day event, attendees will visit the course and find out how Bay Hill addresses the challenges of hosting tournaments, get an insider's look at the course's maintenance facility and operations and check out its new irrigation system and short-game practice area. Foley Grinders will offer an on-site reel and bedknife grinding demonstration to cap off the day.

It Takes a Team: Collaboration and Insight into Preparing and Completing the Renovation at Winged Foot Golf Club

GCSAA TV Stage: Booth #3235

If you can't wait for *Golfdom*'s behind-the-scenes coverage of this year's U.S. Open host course in the June issue and you'll be at this year's GIS on Jan. 29, GCSAA CEO Rhett Evans will be chatting with

the superintendent, builder and architect behind the renovation at Winged Foot Golf Club.

Stephen Rabideau, CGCS, Winged Foot Golf Club, Mamaroneck, N.Y.; Gil Hanse, Hanse Golf Course Design; and Shellene Elmore, vice president, LaBar Golf Renovations will discuss how the Winged Foot golf maintenance team is using innovative technology and techniques to get U.S. Open-ready.

Golfdom | Booth #1831

Drop by and see us at the *Golfdom* booth! We'll have copies of the magazine, and you can grab a couple extra Underdogs of Turf calendars for your crew and apply to be an attendee at the 2020 *Golfdom* Summit. Keep an eye on Twitter during the show because Editor-in-Chief Seth Jones will be presenting the 2019 Herb Graffis Award to Alan FitzGerald, superintendent at LedgeRock Golf Club, Mohnton, Pa., and a newly minted *Golfdom* columnist.

Read on for more of the latest products from golf turf innovators and information on how they can help improve your course. **©**

Golfdom Product Showcase



ANUVIA PLANT NUTRIENTS

Q+A with **Hugh MacGillivray**
Chief Commercial Officer

What makes your plant nutrients different from other fertilizers?

First is sustainability. GreenTRX™, is an enhanced efficiency bio-based plant nutrient product which is USDA certified 87% bio-based. GreenTRX reduces leaching and volatilization which lessens the environmental risk to lakes, rivers, streams and air. GreenTRX also returns 16% organic matter back to the soil which improves soil health.

Secondly, it's a new innovation in slow release fertilizers. GreenTRX is made by using organic materials to create a novel slow release mechanism called the Organic MaTRX™. Approximately 65% of N is released in the first two weeks in the form of NH₄ which provides quick safe greening. The balance of N becomes available as the Organic MaTRX is slowly broken down in the soil, delivering nutrients over six to eight weeks, providing quick and continuous feeding for greener grass longer.



What nutrients are in GreenTRX and how are they different?

GreenTRX is a 16-0-2-17S-2Fe analysis. All the nutrients are in plant available forms. The multi-nutrient product is homogenous with each granule delivering this balanced nutrition for quick uniform deep greening that lasts. It's ferrous iron improves color and performance; sulfate sulfur improves plant health; and the ammonium N is the most efficient form of nitrogen. Because of the slow release, it is less susceptible to leaching. Recent studies show a 50% reduction in N leaching compared to urea and a 39.9% reduction compared to ammonium sulfate.

Describe the characteristics of the product.

The product is a homogenous granule with all the nutrients in each granule. This provides uniform delivery and even distribution. GreenTRX is sold in three sizes a 240 SGN for standard turf conditions, 140 SGN and 90 SGN for golf course and sports turf use.



When can you use GreenTRX?

GreenTRX is an all-season product with excellent turf safety. In the spring it provides a quick response and exceptional greening when soil temperatures are low. Apply in the summer for continued greening with excellent turf safety. Or, it can be used in the fall as a dormant feed to prepare turf for next spring. Because it improves plant and soil health, it is an excellent tool for turf renovation and turf recovery programs.

How does this product impact golfers who love the sport?

GreenTRX makes the course look great and play great while protecting the environment. It's a sustainable approach to turf health that's easy to use and doesn't sacrifice results. Turf truly is greener, faster, longer.

Don't miss The Legends Initiative open conversation with our industry's Legends Initiative notables Bob Farren, Ted Horton, Marsh Benson and Matt Shaffer moderated by Golfdom's Seth Jones — all taking place on Wednesday, Jan. 29, at 3:30 p.m. Inside the Shop, #4800 followed by an open bar at #4409.

6751 West Jones Ave., Zellwood, FL 32798



612-810- 9689



anuviantplantnutrients.com



Anuvia Plant Nutrients



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A DIFFERENT KIND OF FERTILIZER FOR A MORE SUSTAINABLE GREEN

GreenTRX™ fertilizer provides slow-release, bio-based nutrition that feeds turf today, and enriches soil for greener, more sustainable turf management. Its standard, intermediate and elite size granules provide easy application and can deliver uniform results for up to eight weeks.

Visit us at booth #4409.

Ask your retailer about adding the immediate, long-term benefits of **GreenTRX** to your turf strategy.
anuviaplantnutrients.com/where-to-buy

GREENTRX™

**TURF'S
GREENER
FUTURE**

Golfdom Product Showcase



BERNHARD AND COMPANY

Q+A *with* **Steven Nixon**
Director of Sales

How do your products save superintendents time?

Our sharpening systems provide quick set up and ease of use to allow turf professionals to quickly reproduce and maintain sharp cutting units. This not only saves time for the Equipment Manager but also means less time fixing turf quality issues created by dull mowers.

The new RFID capabilities allows the automatic creation of grinding logs for better monitoring and the creation of user set ups for faster use of the machine.

How do your products save superintendents labor?

The automated grinders are a force multiplier allowing the operator to accomplish other tasks while the grinder carries out the sharpening cycle that he has chosen.

The reel surveying system will give you and your turf equipment the highest accuracy for more consistent turf, hence avoiding time and labor to correct inconsistency in cut appearance.

How do your products save golf courses materials or fuel?

The speed of the Bernhard sharpening system allows the user to keep sharp edges on cutting units at all times. By not allowing the dulling of components, mowers can be set to no contact. The no contact set up provides relief from the tension between the reel and bedknife resulting in less fuel consumption.

New technology like smart motors and alternate stones enable the grind to be customized to the mowing equipment providing the most complete and most efficient sharpening in every situation.

How do your products help generate additional revenue for golf courses?

Patrons of our sport are willing to pay a premium for premium conditions. Bernhard and Company's grinders have always helped turf professionals to provide an optimum turf product. The consistency of sharp cutting units quickly leads to improved playability and appearance of the surfaces which translates to more rounds or members, and increased revenue.



In what other ways do your products make golf courses profitable?

Bernhard and Company is fully driven and dedicated to the success of the Golf Course Industry. We are staffed and led by a team who have spent their entire careers in the Turf Industry and we are passionate about seeing other individuals in the industry achieve their best!

Bernhard Company will continue to provide education to turf professionals to ensure they fully understand how to get the most out of our products. Bernhard and company has just opened a new training Academy where we will provide ways for turf professionals to continue their education making them more knowledgeable and their courses more profitable.



BERNHARD

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instagram.com/bernhardcompany



Bernhard Grinders



BERNHARD
TURF HEALTH SOLUTIONS

KNOW BERNHARD? THINK AGAIN. THE EXPRESS DUAL 5500.



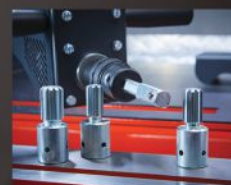
NEW 10.5" touchscreen



NEW Laser technology



NEW RFID technology



NEW Direct reel drive

The Express Dual 5500 is a truly connected reel sharpening system featuring our unique laser reel surveying system, 10.5" touchscreen, contactless cards and direct reel drive.

Find out more at expressdual.com

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TECHNOLOGY

EXPERTISE

SUPPORT

Golfdom Product Showcase



CUB CADET

Q+A

with **Tony Whelan**

Golf & Sports Turf Director,
Sales & Marketing

How do your products save superintendents time?

INFINICUT walk-behind mowers are thoughtfully engineered to provide consistent and precise results. The customizable design allows for quick adjustments to accommodate any desired results. The INFINICUT reel mowers are available in a range of cutting widths for any sports surface: 22", 26", 30", 34" and now available in a twin-blade rotary 34" mower.

New in 2020, select models of INFINICUT mowers will be equipped with a Bluetooth app connection for quick diagnostics. The unique app communicates to mechanics and operators to identify and rapidly resolve service alerts. Superintendents and staff can look forward to reduced downtime and quick servicing.

How do your products save superintendents labor?

INFINICUT mowers are customizable to accommodate varying conditions, with a range of front rollers, cutting reels and rear roller to provide refined results in a single pass. The INFINICUT maintains even and low ground pressure for healthier and more consistent greens, requiring fewer labor hours.

The new Bluetooth app saves

previously used settings that have been catered to the green so it's repeatable, regardless of operator. And, settings are easy to share between operators, so results remain consistent.



How do your products save fuel?

The INFINICUT's lithium battery reduces noise and vibration while reducing fuel costs, which means a safer, greener, more comfortable mowing experience. Plus, its fluidless design helps protect the greens and the operator.

How do your products help generate additional revenue for golf courses?

The INFINICUT offers customizations to fit any green. INFINICUT mowers are compatible with TMSYSTEM cassettes for a healthy and clean

cut. Optimize and customize mowing height and severity for an even cut in any condition, on any day with .10mm increments. With this customization, a superintendent can rely on the INFINICUT for any turf maintenance need.

In what other ways do your products make golf courses profitable?

INFINICUT mowers provide an adjustable bed knife for simple usability that reduces face wear and minimizes plant stress for a healthier turf and a better playing surface. Floating or fixed head options provide flexibility for use on different terrains and price points. The floating head eliminates turf damage and scuffing on uneven terrain. The fixed head offers a stable, rigid head for secure, flat surfaces.

Cub Cadet®



THE PERFECT CUT. EVERY TIME.

Cub Cadet® sets the standard for what turf can be. Our products feature all-electric power for quiet and smooth operations and customizable features for precise results. INFINICUT™ walk-behind mowers can be fine-tuned to .10mm increments with a variety of cutting reels and turf maintenance cassettes to achieve healthy turf and a pristine cut. And the new INFINICUT RGX™ robotic greens mower produces the most consistent playing surface possible by combining mowing and rolling in a single pass with GPS-based efficiency and superior productivity.

CubCadet.com/Turf | [@Infinicut](#) | info@infinicut.com | 866.246.4971

Cub Cadet®

Golfdom Product Showcase



DRYJECT

Q+A *with* **John Paddock**
Owner and President

How do your products or services save golf course superintendents time?

Managers of DryJect Service Centers supply all the labor to operate our injection equipment. This simplifies the magnitude of planning out a large core aeration project.

How do your products or services save golf course superintendents labor?

Labor associated with operating aerators is eliminated. Because our machines fully fill each injection hole with sand or other amendments, topdressing and aggressive dragging to work the material in the holes is either greatly reduced or in most cases not needed at all. As a result, several grounds crew workers are freed up to perform other duties that may have been neglected or have required overtime to accomplish.

How do your products or services help generate additional revenue for golf courses?

Using the DryJect service will aid substantially in retaining the golf

course's normal rounds played pattern when compared to coring, topdressing and aggressive dragging which diminishes the putting surface playability (or the golfer's perception on playability). Whether the course is daily fee or private, using DryJect will prove to retain golfers to maximize revenue streams.

With DryJect's newly designed hopper with agitation, we now have the ability to inject wet sand. Depending on availability and pricing for kiln dried sand, having the capability to inject wet sand may serve to save the golf course a substantial amount of money!

In what other ways do your products or services make golf courses profitable?

Golfers marvel at how well the greens putt just after our service. So, happy golfers equal better profits! Here's what one satisfied customer had to say:

"Our data shows that when we core aerate and top-dress in early September, we see about a \$30,000



drop in revenue over the next two weeks. When using DryJect we realize only one day of lost revenue. We estimate a \$19,000 savings in using DryJect over core aeration."

—Justin N. Smith, General Manager, Olde Homestead Golf Club, PA

DryJect®

DryJect®

The Only Injection Service that Aerates,
Topdresses, and Amends in One Pass.

DryJect®

WET

The revolutionary DryJect service is now even more flexible. Our most recent innovation allows you to use dry sand OR wet sand and achieve the same remarkable results.



**Wet Sand,
Damp Sand, Dry Sand
No Problem**



**Rain or Shine
Capabilities**



**Cost Savings
Opportunities Now
Available**



**Injection that
Aerates, Topdresses,
and Amends in
One Pass**

**DryJect® will no longer
be limited to the use of
only kiln dried sand!**

DryJect® is pleased to announce that we will be able to inject NON-KILN DRIED sand through our machines! This technology will be available through select regional service centers on a limited basis by Fall 2019 and will be available through most of our centers in the late Winter/Spring of 2020.

Through extensive Research and Development, we have engineered a special hopper configuration that includes rotating agitation and staged screening with vibratory assistance to assure affective flow of anywhere from slightly damp sand to wet sand.

In Production!

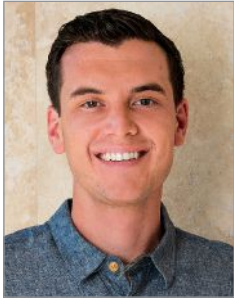


In The Field!



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Golfdom Product Showcase



HUNTER TTS-800 SERIES ROTORS

Q+A

with **Carl Eberts**

Golf Product Marketing Manager

How do your products or services help generate additional revenue for golf courses?

Golf course superintendents have a difficult job when it comes to irrigation management. Playability directly impacts revenue and reputation, so effective irrigation is critical at all times. Harsh environments, water-quality issues, and difficult-to-service rotors can make matters even more complicated. With heavy-duty, highly efficient, and easy-to-service TTS-800 rotors from Hunter Industries, superintendents can push past these obstacles to ensure beautiful, playable courses for years to come.

How do your products or services save golf course superintendents labor?

TTS-800 rotors provide maximum longevity in the field. The high-torque gear drives are the strongest in the



industry, so the challenges of poor water quality are mitigated. The rotors come standard with a robust inlet valve that includes an exclusive Filter Sentry® scrubbing system. Thanks to a powerful wiper mechanism, Filter Sentry scours the filter clean during every opening and closing cycle, which decreases the need to service the rotors and saves on labor.

How do your products or services save golf course superintendents time?

TTS-800 rotors have an innovative manual off switch that enables servicing of the solenoid, pressure

regulator, and internal riser without depressurizing the entire piping system. This means there is no need to spend time draining and then refilling the system if servicing is required.

In what other ways do your products or services make golf courses profitable?

The optimized distribution uniformity of TTS-800 rotors reduces run times, decreases electricity use, promotes water savings, and reduces wear and tear on the pumps. Over time, these benefits lead to significant savings in operational expenses and translate directly to increased profitability.

Hunter®
Golf Irrigation

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PRECISION ENGINEERING, INSIDE AND OUT

Introducing **TTS-800** Series Golf Rotors



THE MOST ADVANCED IRRIGATION SOLUTION IN THE INDUSTRY. Heavy-duty TTS-800 rotors provide maximum uniformity and longevity in the field. The rotors have an extra-large, fast-access flange compartment that comfortably accommodates wire connections and two-way modules. No-dig Total Top Serviceability means maintenance is a breeze.

GOLF IRRIGATION | *Built on Innovation*
Learn more at hunterindustries.com/golf

Hunter®

Golfdom Product Showcase



KLINGSTONE, INC.

Q+A *with* **John Ammons**
Vice President

What does Klingstone do?

Klingstone cures to an inert, plastic-like substance when it penetrates the soil base of the bunker cavity. It is a low viscosity, single component (no mixing) liquid which penetrates soils and binds them together. This keeps soil particles from migrating into bunker sand or drainage systems.

What are the benefits?

- Prevents contamination of bunker sand from below
- Prevents erosion of bunker faces and resultant contamination
- Maintains integrity of bunker drainage systems
- Lowers routine bunker maintenance costs going forward — no clogged or slow drains, therefore no ground under repair or sand replacement due to the dreaded post storm “brown ring” in the low spot of the bunker. Sand displaced in a weather event stays clean and is easily moved to its proper location in the bunker.
- In-house personnel can easily renovate bunkers as time and budget permits by installing Klingstone on a few holes per year. Superintendents can keep these projects in-house, keep annual renovation costs reasonable, and, best of all, not need to start again on the first three holes when the last three are complete.

How long does Klingstone last?

We don't know yet. The liquid product penetrates the base soils producing an inert plastic-like (permanent) barrier. The polyurethane in the soil will not break down over time unless exposed to direct UV light for prolonged periods, which is unlikely when covered with sand. Our oldest installation is in Minnesota and going strong since 1999, despite the severe climate.

How does Klingstone outperform other bunker liners?

- Textile liners can be slightly cheaper to install. However, they typically fail over time — making them more expensive in the longer term. Grooming equipment tines can catch and tear the fabrics, causing unsightly (and dangerous) tufts of fabric to stick up through the sand. Additionally, mechanical staples can lose their hold, especially in sandy or loamy soils, causing the fabric to separate from the subgrade. As a wise man once said, “You buy cheap, you buy twice!”
- Cement- or concrete-based products crack, break into chunks, and disintegrate from weather-related soil

Klingstone
the permanent bunker solution



expansion and contraction. Klingstone is a plastic, not a concrete — and it is hard to a rap from the knuckles, but will yield slightly to a fingertip. So, Klingstone moves with the soil rather than fighting it. We have many satisfied customers in Michigan, Minnesota, Ontario and other locations with harsh environments.

- Klingstone is the only bunker liner that seals off the bunker substrate, eliminating contamination of the sand and drainage systems. We know of no other system that protects the integrity of your drainage the way Klingstone does. That means faster-running drains, faster-drying sand, and faster to get bunkers back in play.

235 Pigeon Street, Waynesville, NC 28786  828-456-9970  klingstone.com

GIS BOOTH 3719

Klingstone®

the *permanent* bunker solution

The *BEST* Bunker Liner

Longevity? 20 years...and counting...

Veteran Owned

www.Klingstone.com

US Patent No. 6,467,991

Golfdom Product Showcase



MAREDO

Q+A *with* **Marinus Reincke** President

How do your products save golf course superintendents time?

The MAREDO GT series save time because the heads turn a triplex greensmower into a different kind of maintenance machine for your greens, e.g. a corer or seeder. And since a triplex greensmower is especially developed for use on greens, using the MAREDO GT heads will create another perfect maintenance machine for your greens.

How do your products or services save golf course superintendents labor?

The MAREDO GT heads are innovative, new and often the only ones on the market. Think about our counter rotating (frazzle groomer) verticutters, our HiSpeed coring head and our efficient seeder heads. They all work in a special way with which they save lots of labor



for the superintendent. Mainly because these heads work very efficient, very clean and with hardly any damage to the turf. If the maintenance work is done in a simple one pass operation, without any repair of the turf like rolling or top dressing, it saves the superintendents a lot of labor.

How do your products or services save golf courses materials or fuel?

The MAREDO GT heads just fit a (hybrid) triplex greensmower. A powerunit that is tuned for use on a green. MAREDO uses special technology, like vibration, that helps do the maintenance job in an easier way that needs less power. It means that we don't need big machines to drive it, like tractors, but just a triplex. A triplex is also very maneuverable, which means that the job can be done in less time. That all helps saving fuel. But we can save even more fuel, since our heads fit a hybrid or fully electrically driven triplex as well.



How do your products or services help generate additional revenue for golf courses?

With all the facts mentioned above, we are able to create a quick return on the investment on the MAREDO GT heads for the golf course. Low fuel consumption, a high production rate, an efficient maintenance task and a quick recovery mean the overall maintenance costs will drop and the revenues will go up. When we also take into account that our seeder plants the seeds in the existing turf, we can drop the seed dosing rate. Less seed means lower seed costs and hence more profit for the golf course.

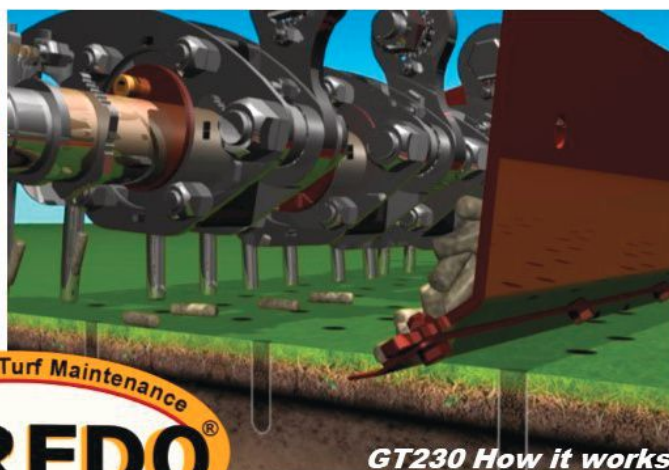
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MAREDO GT SERIES



GT230 HiSpeed-Corer



GT230 How it works



GT410 How it works



GT410 VibeSpike-SeederF

Why you need our GT heads:

MAREDO® develops and sells **innovative machines** for turf maintenance. **MAREDO** machines will help you to maintain your turf faster and more efficient. Our **GT heads** fit most common used triplex greensmowers. **MAREDO** GT heads can turn a greensmower into a high speed corer. With this **GT230 HiSpeed-Corer** you can remove thatch and organic material up to 1" deep at mowing speed with hollow tines or vent your greens with solid/slicer tines. Or turn your triplex into a very efficient, fast Bentgrass seeder with our **GT410 VibeSpike-SeederF**, that plants the seed. Please check our website for more **innovative heads**!

MAREDO is a Dutch company and has its own branch in the US.

www.maredocommercial.com



GIS 2020
BOOTH
#3625

Golfdom Product Showcase



NUFARM

Q+A

with **Dave Biegacki**

Customer and Brand Manager,
Turf & Ornamentals

How do your products save golf course superintendents time?

Nufarm offers a leading line of herbicides to simplify maintenance of naturalized areas. At Nufarm, we suggest a two-application program to keep weeds out and native grass stands pure. Consider applying Sure Power in the fall. Sure Power selective herbicide has the power to quickly strike down more than 250 broadleaf weeds, including ground ivy and wild violet. Save time with one fall application that will keep naturalized landscapes weed free throughout the entire winter season.

How do your products save golf course superintendents labor?

By default, maintaining a naturalized area requires less labor resources — such as mowing and chemical application — than playable surfaces. However, naturalized areas still need some attention to prevent weed takeover. A spring application of Millennium Ultra 2 will quickly “melt” tough weeds, even thistle, without leaving unsightly dead, brown plants

behind. This premium selective herbicide saves turf managers from applying multiple applications or hand-weed labor. In addition, Millennium Ultra 2 is gentler on milkweed, allowing the plant to bounce back after initial suppression. Milkweed provides habitat for Monarch butterflies, making it a great choice for designated pollinator zones.

How do your products save golf course superintendents material?

Save on chemical inputs by using the longest-lasting residual product. SureGuard SC can keep non-turf course areas weed free for eight months or more, meaning there is less product to buy and apply. Plus, SureGuard SC works in more than ornamental landscape settings. For warm-season courses, keep SureGuard SC on the shelf for dormant Bermudagrass application. It provides excellent control of



winter weeds, including Poa, and binds tightly to the soil so there is less concern regarding runoff to overseeded rye.

How do your products help generate additional revenue for golf courses?

With a simple application program, naturalized areas can directly benefit your bottom line, but they can work to generate revenue as well. Courses may publicize the benefits of environmental sustainability and enhanced beauty, both of which result in more booked rounds — and more revenue — for your course.

SurePower

SureGuard SC
HERBICIDE

Millennium Ultra²

Nufarm

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800-345-3330



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GIS BOOTH 4217

PLAYABLE + NATURALIZED AREAS, GROWING HARMONY

Naturalized areas can be both beautiful as well as beneficial to your bottom line. However, it is important to remember that naturalized areas do require some level of maintenance to prevent takeover by undesirable weeds. Our line of herbicides will help you achieve optimum balance between naturalized, yet managed, landscape settings and our team of golf experts will guide you every step of the way.

ASK YOUR LOCAL NUFARM REP ABOUT OUR NATURALIZED AREAS PROGRAM

Millennium Ultra²
SELECTIVE HERBICIDE

[NUFARM.COM/USTURF](https://www.nufarm.com/usturf)

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Grow a better tomorrow

Golfdom Product Showcase



POGO TURFPRO SYSTEM

Q+A with **Carmen Magro**
Vice President/Chief Agronomist

How does POGO save time?

Superintendents demand precision. Without it, failure is imminent. The POGO TurfPro system allows supers to know precisely the true condition of their turf, while providing many other insights and measuring stress on turf performance. POGO helps superintendents make the best use of their time with only minutes per day, as we understand both the short- and long-term impacts of less-than-optimal decisions.

How does POGO save labor?

All superintendents want to know their operations are efficient and precise. The POGO system clearly indicates what the turf sees and what influences it, bad or good, so that the right decisions can be made quickly and efficiently. Further, it is especially insightful at trending conditions and predicting the impacts of current or planned irrigation, fertilization or cultural practices, allowing users to make efficient labor decisions. With POGO's innovative mapping features, users can quickly visualize their practices and see the results of their operations over time while logging features and attributes specific to their property.



the natural performance of turf to meet the demands of the game. POGO is the only scientifically-based monitoring and analytical system in the industry that never requires calibration and always measures the most influential component of the turf system that impacts surface performance and true health. It remains accurate and precise through the ever-changing dynamics of turf systems and allows for instantaneous mobile mapping analytics.

How does POGO save materials?

In only minutes a day, POGO provides supers with the knowledge that they are using materials efficiently and effectively. With the world increasingly putting pressure on the green industry to utilize strong fundamental practices in lieu of pesticides and other plant protective products, we must be efficient and precise in our decision-making now more than ever. This is especially true with the use of water, nutrients and cultural practices designed to improve

How does POGO impact revenue?

It is difficult to put a price on the loss of value due to sub-optimal conditions. Such a loss has terrible consequences on facilities and the quality of life of the superintendent and staff. Using the POGO system prevents the loss of revenue by informing superintendents of turf stress long before symptoms appear. Making the best decisions for advancing turf performance requires knowing what the turf conditions are and where they are going with every influential variable that impacts it. The POGO system is the staple monitoring and analysis system that the industry depends on to know what the actual conditions of the turf system are.

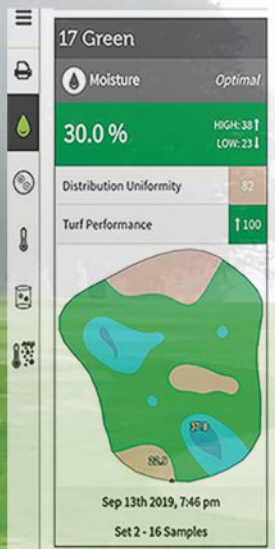


Superior insight | Better decisions | Healthier turf

SAMPLING



VISUAL INSIGHT



MAPPING



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PIN PLANNER



PIN SHEET



AUDIT / ANALYSIS



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Golfdom Product Showcase



PROGRESSIVE TURF EQUIPMENT

Q+A with **Rob Janmaat**
General Manager

What products does Progressive Turf Equipment offer to help golf course superintendents?

Since 1990, Progressive Turf Equipment has built different mowers for different types of customers. Whether it's the 5 deck Pro-Flex, a Tri-Deck or a Contour Roller mower, Progressive has mowers for any application from 10' to 36' wide. On top of that Progressive also has a fairway roller called the Pro-Roll that comes in 10' and 15' widths.

With the different mower widths available, it allows the superintendent to match the proper mower to their course to get the maximum mowing done in the shortest amount of time. Other innovative options that are Progressive-exclusive are: Pro Lift-N-Turn, 100-hour greasing interval PTO shafts, Adaptive Swivel Hitch, HEX drive roller end and bearings — all time-saving elements to help reduce superintendents' mowing costs and prevent downtime.

In what other ways do your products make golf courses profitable?

Lower operating cost! Running a

mower costs money but it must be done. Progressive's approach is to offer both increased utilization and higher production to combat cost. They choose Progressive mowers for their quality, dependability and workmanship that goes into every mower. Many facilities are moving to pull-behind rotary mowers; not only are they a lower cost purchase option than self-contained units, but ongoing maintenance costs are lower and simpler. Because of the simplicity and construction of a Progressive pull-behind mower, the useful life is much longer than other mowers, thus it is easier on the capital budget year after year.

What makes Progressive Turf Equipment mowers appealing to a golf superintendent?

With all Progressive mowers/rollers being pulled with a turf tractor, it gives the superintendents the freedom of using the tractor for other uses around the course when the



mowing is done. The tractor is not dedicated to mowing unlike the self-contained mowers on the market. The increased utilization saves them money.

How do your products help golf course superintendents sleep at night?

With the introduction of the new TDR-X, which will be featured at this year's GIS, and along with the Pro-Flex 120B, Progressive offers two styles of contour mowers so a superintendent can select the best mower for their course and spend their money wisely.





The Better Built Choice.™

FOR GOLF, WE KNOW **CONTOURS**



Pro-Flex 120B Contour Mower



Pro-Roll 15 Contour Roller

THE NEW TDR-X CONTOUR ROLLER MOWER



- ✓ 10'6" wide cut
- ✓ 3 Floating decks
- ✓ Full width rollers
- ✓ No daily greasing
- ✓ Adaptive Swivel Hitch
- ✓ Lift-N-Turn
- ✓ Choice of blades styles



For over 30 years, professionals worldwide have relied on Progressive mowers. Find out why a Progressive mower is ...
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Golfdom Product Showcase



PURSELL AGRI-TECH

Q+A *with* **Nick Adamchak**
President & CEO

How do your products save superintendents time?

PurKote adaptive nutrient technology allows golf course superintendents to make fertilizer applications that release targeted nutrients on a specific time line. In other words, we have the technology to design the fertilizer to meet your specific plants nutrient needs and it will deliver those nutrients on a custom designed schedule. Instead of having to apply multiple applications, PurKote's patent pending controlled release technology removes the need for constant fertilizer application during this planned time line. Less time worrying about getting nitrogen on the course, more time for all of the other endless tasks facing the modern-day superintendent. The release of these nutrients through the coating allows

for precise feeding of the turfgrass on a schedule that fulfills the plants nutrient requirements while meeting performance expectations. Precision use of fertilizer allows the golf course superintendent to be more efficient with their time.

How do your products save superintendents labor?

Traditional uncoated fertilizers require monthly application. In contrast, PurKote will continuously release nutrients for up to 6 months. This release is determined by the agronomic plan developed by the golf course superintendent. Fewer applications over broad acres saves significant labor and reduces over-application of nutrients.

How do your products save materials or fuel?

When applying PurKote the golf course superintendent is using the latest and greatest development in controlled release fertilizer technology. Using PurKote reduces the number of fertilizer applications and improves the efficiency of every ounce of nutrient applied. These efficiency improvements create savings in both fuel and materials.



How do your products help generate additional revenue for golf courses?

The Pursell family has created PurKote as the next generation of fertilizer coating. This new technology works like no other fertilizer products in helping create lush, green, healthy golf courses. It incorporates materials for people to use that have not been widely available before. Beautiful courses translate into more rounds and more revenue.



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GIS BOOTH 821

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designed to lower costs
and solve nutritional &
environmental concerns.

Visit the Pursell Agri-Tech booth at
the GIS Show in Orlando.

Booth# 821

Golfdom Product Showcase



RAIN BIRD

Q+A *with* **Carolyn Maloney**
Channel Marketing Manager

How do your products or services save golf course superintendents time?

At Rain Bird, we build durability into every product. As a result, superintendents can count on their irrigation systems to offer optimum performance with minimal maintenance. Less maintenance takes less time and reduces overall expenses. Our products are easy to use and intuitive, so new employees require less training to start using them effectively.

How do your products or services save golf course superintendents labor?

Our industry is facing a labor shortage, and everyone has to find ways to be more efficient. Because our irrigation systems take less time to maintain, superintendents can use their crews on other course projects. And, because our systems distribute water more uniformly, there's less time spent hand watering or repairing turf due to insufficient or uneven coverage.

How do your products save golf courses materials or fuel?

A Rain Bird irrigation system operates more efficiently, reducing the amount of water necessary to keep golf course turf in top condition. Because you're applying less water, you operate your pump station less, which translates to power savings. Those savings also extend to fertilizers and other turf care products, because correctly applying water will cause fewer nutrients to leach from the soil.

How do your products help generate additional revenue for golf courses?

In today's competitive golf course market, it's more important than ever before to offer golfers an outstanding experience that encourages them to return to your course, again and again. Courses can rely on their Rain Bird irrigation systems to help them deliver exceptional playing conditions for many years with minimal upkeep. Our irrigation systems simply make good economic sense.



In what other ways do your products make golf courses profitable?

At Rain Bird, we're dedicated to offering products that make it easier for golf courses to have state-of-the-art irrigation systems with fewer renovations. For example, our new, ground-breaking Integrated Control Interface Plus (ICI+) is now helping courses with satellite systems quickly and easily upgrade to the many benefits of our two-wire IC System™ and accompanying IC CONNECT products.

And, our Timeless Compatibility™ promise means that our products are backwards compatible, making it possible for courses to update and improve their irrigation systems as time and budgets allow. When golf courses invest in a Rain Bird irrigation system, they're making a choice that will have a positive impact on their profitability for years to come.



CONNECT TO

Upcoming technologies

Simplified upgrades

A partner dedicated solely to irrigation

THE FUTURE



"There are always upgrades coming out and nobody wants to feel left behind. If I can do just a quick upgrade and keep using what I already have, that feels great, and Rain Bird allows us to do that."

Stephen Rabideau, CGCS | Director of Golf Courses, **Winged Foot Golf Club**

Discover the benefits of a Rain Bird system at rainbird.com/TheFuture, and visit us at **GIS Booth #4235**.



RAIN BIRD®

Golfdom Product Showcase



SIPCAM AGRO USA

Q+A

with **Todd Mason**

Director of Sales & Development
for Turf & Ornamental

How do your products or services save golf course superintendents time?

We've come up with some unique formulated product combinations through our Enhanced Turf Quality (ETQ), that have a broad spectrum of control. This saves the superintendents time in tank mixing and making multiple applications.

How do your products or services save golf course superintendents labor?

We save the superintendents labor by creating several combination products that cover whatever disease spectrum they're targeting. This means fewer trips over the greens and fairways, which is a good thing.

How do your products or services save golf courses materials or fuel?

From a materials perspective, it's easier and more efficient for the superintendents to buy our products, which are already formulated together, rather than buying multiple products and tank mixing. It's not uncommon for a superintendent to

have to source chemicals from multiple places. The fact that we've got it ready to go for them is a huge asset and a huge savings. Instead of triple rinsing three containers, they might be able to just triple rinse one. It really makes a difference.

How do your products or services help generate additional revenue for golf courses?

Generally speaking, revenue is driven by playability. The fact that we have products that maintain healthy turf during stress conditions helps them generate more revenue by creating better playing conditions when that may not be an easy task. Players would rather have a greener, smoother surface, and they're going



to patronize the courses that offer those conditions. We're proud to play a role in the process that leads to greater revenue.

In what other ways do your products or services make golf courses profitable?

By offering already-mixed products that have been tested at the university level or in the field, we eliminate guesswork and time researching the right chemical for the job. It's easier and more efficient to buy the mixtures and do it that way. Time is money and the more time we save the superintendent, the more time they can spend on other projects.



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Golfdom Product Showcase



STANDARD GOLF

Q+A *with* **Matt Pauli**
Director of Marketing

How do your products save golf course superintendents time?

A manufacturer since 1910, Standard Golf has been helping to improve many aspects of the superintendent's job for some time. Innovations include: hole cutters, electric ball washers, drag mats / brushes, signage and custom flags and tee markers. Many of these items have helped to save the superintendent time as they are able to complete tasks quicker, with more precision and accuracy. This trend will continue in 2020 with our new Ultimate Utility Vehicle Tool Racks. These tool racks mount to the exterior of a UTV allowing the superintendent to take many more tools with them around the golf course. This should help save time as the superintendent can spend more time on the course and

the task at hand by eliminating wasted time traveling to the golf course and back for additional tools.

How do your products help generate additional revenue for the golf course?

Many may not think of Standard Golf products to help increase revenue but we do have a few that can both indirectly and directly help increase revenue. Start with first impressions for any tee box, green or the clubhouse. Great looking signs and flags can help to make golfers feel comfortable and realize that the course they are playing cares. Do not start giving your customers reasons to doubt their choice. Range equipment can also help increase revenues with automatic



ball washers - saves on time to clean the range balls. Range targets, flags and bag stands also help to enhance the golfers experience. Our custom products can directly influence revenue particularly flags. Not only can you offer flags for retail sale that match the course, but how about using custom flags for hole sponsors or awards for outings and tournaments. A custom flag with your course / event logo or the sponsors name is a great takeaway and can start at just \$15 per flag.



VISIT STANDARD GOLF AT BOOTH #4829
AT THE 2020 GOLF INDUSTRY SHOW
OR BOOTH #2929 AT THE PGA
MERCHANDISE SHOW



Standard Golf's new products for 2020 are designed to help
Superintendents stay more organized and work more efficiently, protect the cup
with our ball retriever, and declutter your golf course with our in ground trash cans and more!

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Golfdom Product Showcase



TARGET SPECIALTY PRODUCTS

Q+A

with **Mark Jull**

Turf Fuel Products Division Manager

How do your products help generate additional revenue for golf courses?

Our most popular product combination is called 'Rapid Recovery' because it helps turf recover from many different situations quickly, allowing play to resume much sooner. When superintendents use the Rapid Recovery program in conjunction with aerating, they are able to charge full green fees 3-4 days sooner. This results in thousands of dollars of additional revenue.

How do your products save superintendents time?

Through our vast network of technical sales reps across North America, we get constant feedback on challenges superintendents face, and also ideas of how to solve those challenges. Our product development process is centered on creating solutions that address those real-life challenges.

An example of this is Cleanse. Cleanse was originally developed to remediate soils suffering from localized dry spot (LDS). We realized that once the LDS was removed, there was a lot of time spent getting turf to recover from the damage. In 2019, we added Soil Sync to Cleanse which speeds up

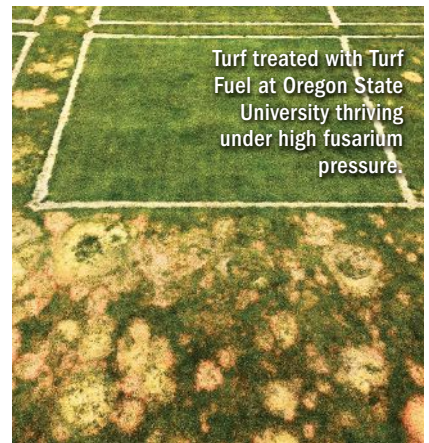
the recovery time. The combination of soil remediation and turf recovery components in Cleanse solves two issues at once.

How do your products save superintendents labor?

Water management is one of the most important and time-consuming tasks on the golf course. Time spent monitoring moisture levels and the resulting hand watering to achieve consistency takes a lot of labor. These tasks often lead to long days and overtime pay. The Turf Fuel portfolio includes six soil surfactants, each designed to give the superintendent control over the way water works in the soil. When the right surfactant is used, the time spent managing water is significantly reduced.

How do your products save golf courses materials?

One of the core goals with Turf Fuel is building turf health and durability. We are constantly looking for ingredients



Turf treated with Turf Fuel at Oregon State University thriving under high fusarium pressure.

and technology that will give turf the ability to thrive in stressful situations. Our superintendent customers have found that since their turf can handle stresses so much better, they have been able to reduce chemical fungicide and herbicide rates and frequency. This adds up to major cost savings.

Turf Fuel products have been tested at several universities where they have found tolerance to typical diseases. Oregon State University has been testing Turf Fuel products in their Fusarium (microdochium) study for the last two winters. The combination of Turf Fuel Element 6 and MZ-23 outperformed many of the chemical fungicide treatments. We have many superintendents experiencing similar results on their golf courses.



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Golfdom Product Showcase



TURFCO

Q+A

with **Scott Kinhead**
Executive Vice President

After 100 years of your family's participation in the golf industry, what do you see as the key challenges?

I grew up working in this industry at a time when labor was plentiful and superintendents had more resources. Now labor shortages are a key challenge, and productivity has become more crucial to achieve the same results. At Turfco, we listen to superintendents and ask crews what would help them be more productive. Their suggestions lead to new and sometimes surprising innovations. Our focus is helping superintendents create the beauty they want more productively.

What else is Turfco doing to help solve these problems?

The Torrent 2 is a good example. We observed that if an operator's nozzle angle is too low or too high by 30 degrees, it could cost up to two hours per day in productivity. When



superintendents demo our product, with faster, more precise wireless nozzle rotation, they say, "Why has no one done this before?" The idea for an instant idle/resume button also came directly from operators. "Can this be done?" they asked. We thought, why not?

You've talked about reducing passes while topdressing. Why does that matter?

It matters for several reasons. If you have to do overlapping spreads to achieve an even distribution, it translates into more passes and more traffic on the greens. The Turfco WideSpin 1550 with even feathering on the edges can save one to four passes per green. If you calculate that over 18 holes throughout the year, a



superintendent could save up to 720 passes per year. With savable presets, you can get your preferred application every time. If you're not happy with your application, you need to see the 1550.

How do you bring productivity to the seeding process?

We saw that traditional seeders were complicated and hard to hook up, causing mixed results. Our TriWave 45 Overseeder is easy to tow behind any turf vehicle. The quick seeding delivery system reduces waste and ensures over 30 percent better germination. Plus, our floating heads follow the contours of the terrain for consistent seed depth. Now seeding damaged or weak areas is fast, easy and you get the results you want.



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GIS BOOTH 5217

Time. Our greatest invention.

Creating a perfectly breathtaking course requires your passion and knowledge. It also takes something you don't always have: Time. At Turfco, we're always looking for ways to free-up your time. Ways like saving up to two hours per day with the Torrent 2 Debris Blower. Reducing up to 720 passes on your greens per year with the WideSpin Topdresser. And seeding more quickly to achieve better results with the TriWave Overseeder. We bring innovative technologies that improve performance, while giving you back what matters most. Your day.

It's worth your time to see the difference. Schedule your demo today at www.turfco.com or call 800.679.8201

Torrent™2
DEBRIS BLOWER



WideSpin™ 1550
BROADCAST TOPDRESSER



TriWave™ 45
45-INCH OVERSEEDER



Schedule your demo today at www.turfco.com or call 800.679.8201



THE LEADER.

Golfdom Product Showcase



BLINDER BUNKER

Q+A *with* **Alan FitzGerald**
Director of Operations, USA

Blinder Bunker Liner is the original porous, seamless and flexible bunker lining solution. Created by a golf course superintendent to be the definitive bunker lining and drainage system, it addresses all the traditional issues related to bunker management.

The 1" thickness of the Blinder liner creates a functional drainage layer, with

the rubber crumb sized to bridge most — if not all — bunker sands, ensuring that the drainage layer will not clog, therefore guaranteeing the longevity of the liner. The crumb rubber is mixed onsite, creating a robust homogeneous mix that, once set, is flexible enough to withstand freeze-thaw cycles and club strikes. By preventing washouts,

Blinder saves time, labor and money in getting bunkers back into play after a rain event, with the added benefit of no down time or substandard conditions to the golfer. The long-term savings of extending the life of a bunker and ensuring there is minimal down time to golfers make Blinder an essential part of any bunker renovation.

blinder® BUNKER LINER

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Golfdom Product Showcase



SYNGENTA

Q+A

 with **Stephanie Schwenke**
Market Manager

What can superintendents expect in Syngenta Booth #2628 at GIS 2020?

We're excited to give superintendents an in-depth look at the science behind the Action™ family of products through our Experience the Action virtual reality. Participants will see how *acibenzolar-s-methyl*, the plant defense activator in Daconil® Action, Heritage® Action and Secure® Action fungicides, helps protect turf from stresses like disease, heat and drought. They'll also be entered for a chance to **win one of six sets of Sonos® One Bluetooth® speakers** (view full contest rules at GreenCastOnline.com/GIS).

Syngenta will also introduce two new fungicides at the show, which will be coming in 2020.

How can superintendents prioritize their personal health at GIS 2020?

As part of our #ConditionPerformRecover initiative, which focuses on turf and superintendent health, we're offering free health checkups and **skin cancer screenings in booth #2607** in the

GIS wellness pavilion. A registered nurse will provide blood pressure measurements, cholesterol screenings, glucose analyses and more. Attendees can also get **free health counseling and health/wellness information**.

On January 30 at 6:30 a.m., Syngenta and the GCSAA will also host the **fourth annual Health in Action 5K**. All registration proceeds will benefit the Environmental Institute for Golf. To register, visit GreenCastOnline.com/GIS.

What other activities will Syngenta be participating in at the show?

Syngenta is proud to partner with industry organizations to support the following events at GIS 2020:

GCSAA Certification Luncheon
(Jan. 29 at 12:30 p.m. in the North Hall, main stage – North



Concourse): Syngenta and the GCSAA will celebrate the Class of 2019's newly Certified Golf Course Superintendents (CGCSs) and provide special acknowledgements of 25- and 40-year CGCSs in attendance.

Ladies Leading Turf Discussion Panel and Networking Reception
(Jan. 29 at 3 p.m. in the Convention Center, S230AB – South Concourse): Syngenta, Ladies Leading Turf and the GCSAA will host the third annual diversity and inclusion session celebrating women in the turf industry. The session will feature leading women in turf about their journeys to success, including how to foster diversity.

A full list of Syngenta activities at GIS 2020 is available at GreenCastOnline.com/GIS.



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Super Science

// AN ONGOING PROCESS

A NEW-EMPLOYEE TRAINING SYSTEM

By Joe Stribley and Cody Schulke

New employees are part of the staff at most golf courses, and getting them up to speed quickly is essential for an efficient operation. We have developed procedures over the years to help new employees become productive as soon as possible. We would like to share our ideas with you.

We start with a general orientation of the maintenance facility, followed by the new employee reading the employee manual and a discussion of its contents with one or both of us. We place an emphasis on safety from the start, with frequent safety tips and reminders throughout the summer.

“We have developed procedures ... to help new employees become as productive as possible.”

The first thing we require of new employees is to safely learn their way around the golf course. To accomplish this, new employees are tasked with picking up trash at each tee — in order from hole 1 to 18 — and taking time to observe the routing of holes and play pattern of golfers. We direct them to formulate a strategy that disturbs a golfer only once when carrying out a task.

Before operating a piece of equipment, we give each new operator an equipment training sheet to read what is specific for that piece of equipment, and they're required to watch a training video for that piece of equipment. The mechanic then shows the new employee how to operate the equipment, including all safety features, followed by how to properly fuel and wash the equipment. Finally, an experienced operator provides on-course training in how to properly use the equipment.

The routes for all mowers are mounted on the machine. If there are changes from the normal routine, we give operators a card with specific instructions for that day.

The cost of the equipment is a key piece of information we include on all equipment training sheets. We want all employees to know that they are being trusted to operate an expensive machine.

Training is an ongoing process for all employees, including us. We constantly update our training procedures to make them more effective.

We would be pleased to share our employee manual and equipment training sheets with anyone who is interested. 

Joe Stribley recently retired as superintendent of Yellowstone Country Club in Billings, Mont., where Cody Schulke is the assistant superintendent. You may reach Cody at codyschulke@hotmail.com for more information.

NEWS UPDATES

EPA GRANTS POACURE REGISTRATION

The Environmental Protection Agency (EPA) has granted an unconditional registration of Moghu Research Center's PoaCure.

PoaCure is a pre- and postemergence grass herbicide for selective control of annual bluegrass and roughstalk bluegrass in golf course turf, including creeping bentgrass putting greens.

PoaCure is a new turf herbicide based on the active ingredient methiozolin. The EPA granted registrations of methiozolin and two formulations of PoaCure. The approval covers golf courses only, but Moghu plans to expand the uses to sports turf and sod in the future.

Moghu started applying for state registrations and expects registrations in most states will be available before April 2020. The state registration statuses will be posted at PoaCure.com, which will launch Jan. 2020.

PoaCure will be manufactured in South Korea and directly distributed to U.S. golf courses by Moghu USA.

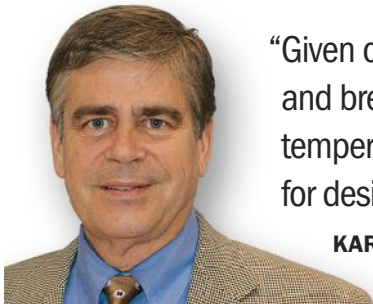
PoaCure will be packed in 16-fl-oz bottles. The tentative price is \$250 per bottle and \$5,000 per box of 20 bottles. One bottle is good for six applications on ~4,400-sq.-ft. putting greens, while a box is good for six applications on 2.1 acres of putting greens or four applications on 1.6 acres of green surrounds/fairways.

... THOUGH CULTURAL

STRATEGIES MAY LIMIT INJURY FROM DOLLAR SPOT, FUNGICIDES OFTEN ARE REQUIRED FOR SUCCESSFUL MANAGEMENT.”

Cole Thompson, Ph.D.

(see story on page 66)



“Given open turf, low humidity and breezy or windy conditions, temperature is a good predictor for desiccation.”

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

One-upping about winter desiccation

The “Four Yorkshiremen” is a classic comedy sketch associated with British comedy troupe Monty Python. It consists of four men at a resort discussing what it was like growing up poor.

In the sketch, each one tries to one-up the others. As the conversation progresses, the stories become increasingly absurd. An early exchange in the sketch goes something like this:

Man 1: In them days, we’d a’ been glad to have the price of a cup of tea.

Man 2: A cup ‘a cold tea.

Man 3: Without milk or sugar.

Man 4: Or tea!

Man 1: In a filthy, cracked cup.

Man 2: We never had a cup. We had ‘a drink out of a rolled-up newspaper.

You get the idea.

I experience a similar situation with superintendents one-upping each other about winter desiccation. Winter desiccation is the death of turfgrass leaves or plants from winter drying. Desiccation occurs most often on open, semidormant turf exposed to windy, low-atmospheric-humidity conditions. The two major types of winter desiccation are atmospheric and soil drought.

Atmospheric drought normally is associated with leaf tissue death. Favorable conditions for this type of desiccation are sunny, windy conditions combined with low atmospheric humidity. The soil may have adequate moisture but is frozen or cold enough to increase the viscosity of the soil

water to the point where uptake is severely restricted. Plants with restricted or shallow root systems — like *Poa annua* — are sensitive to atmospheric drought. Desiccation symptoms appear similar to drought in that leaves are brittle dry and have a burned look.

Given open turf, low humidity and breezy or windy conditions, temperature is a good predictor for desiccation. When air temperatures exceed average soil temperatures by more than 20 degrees F, conditions are favorable for desiccation.

Atmospheric drought is common through the Midwest and eastern U.S. Although atmospheric desiccation can cause leaf death, it’s not normally associated with crown or plant death. However, juvenile or succulent-growing turf is especially susceptible to desiccation and death. The injury sustained with atmospheric desiccation recovers once the plant begins growth in early spring.

The second type of desiccation occurs from lack of rain or snow under low-atmospheric-humidity conditions and

progressively droughty soil conditions, sometimes resulting in plant death. In cool, arid regions like the western arid regions of the United States, this type of desiccation is common.

Returning to the Four Yorkshiremen, the atmospheric and soil winter desiccation that occurs through the northern Great Plains and western United States is the final one-up story in the desiccation discussion. It’s fascinating how superintendents manage greens in the region. Desiccation can be so severe that water trucks or irrigation pipe installed below the frost line sometimes supply water to greens. Contrast this to courses like those in Ohio, where we winterize irrigation systems by blowing water out of the system.

It takes talent to apply enough water to greens to reduce the severity of desiccation without applying too much water, especially in later winter with the potential for freeze injury.

We break down covers to protect greens from winter injury into two major categories — permeable and impermeable. Permeable covers allow for air, light and water to penetrate the cover. Permeable covers protect greens from wind and sun exposure.

Impermeable covers are resistant to air and water penetration. Impermeable covers are adapted to extreme cold and long-term winter conditions.

Superintendents often live in a bubble. Surrounded by colleagues in similar situations, they tend to think of their agronomic problems — like desiccation being the norm — locally. This winter, as you attend regional and national turfgrass conferences, seek out superintendents from around the country to get their perspectives on agronomic issues you face. You may find yourself — like the Four Yorkshiremen — discussing a topic with a broad viewpoint across a broad spectrum. **G**

Karl Danneberger, Ph.D., *Golfdom’s* science editor and a professor at The Ohio State University, can be reached at danneberger.1@osu.edu.

// DOES CULTIVAR SELECTION MATTER?

Dollar spot susceptibility of bentgrasses

By Cole Thompson, Ph.D.

Ask a fellow superintendent to list the top 10 problems that influence his or her agronomic programing. Contrary to the classic David Letterman style of beginning at the bottom of the list, I would wager that you could predict the majority of the top five.

I can almost hear Paul Shaffer's audible murmurs rubber-stamping each mention of overall budget, labor and resource availability, event schedule and the expectations of clientele.

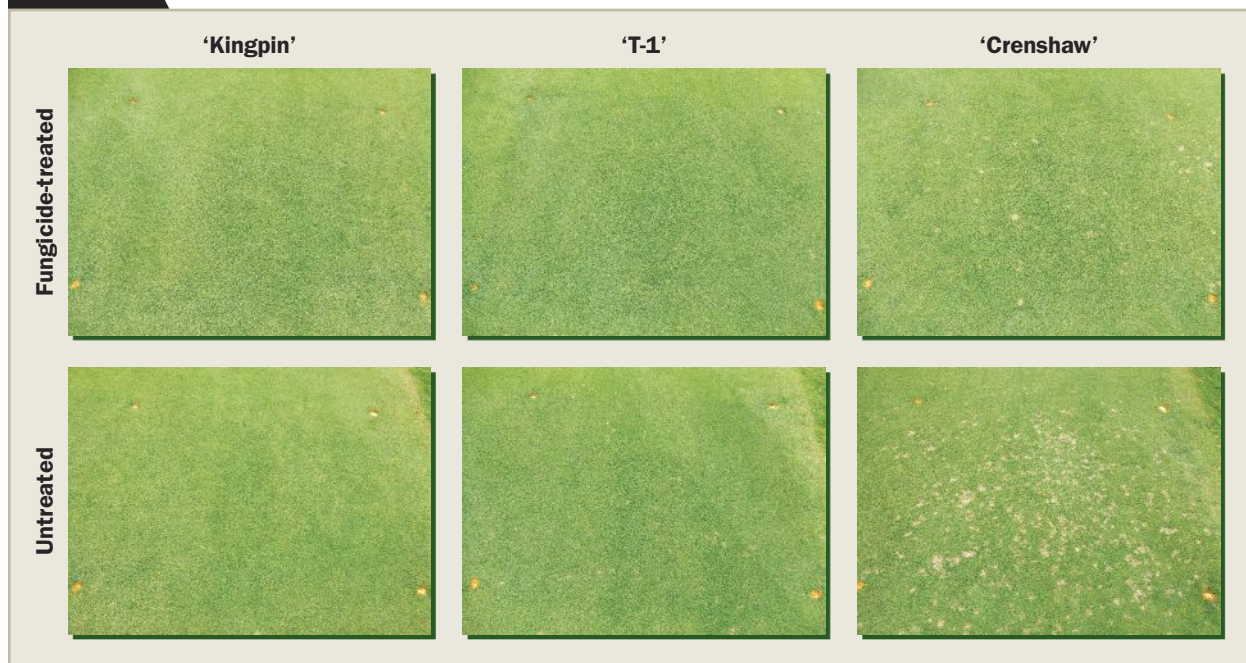
Agronomic considerations may not directly show up until the middle to bottom of the list. These items will

“Though cultural strategies may limit injury from dollar spot, fungicides often are required for successful management. However, the repeated use of site-specific chemistries has led to the selection of populations of the dollar spot pathogen that are resistant to some active ingredients.”

begin to vary by climate and grassing scheme and may be more difficult to predict. However, if your colleague is growing bentgrass (*Agrostis* spp.), it's likely that preventing injury from

dollar spot (caused by species within the genus *Claviceptis*) would land squarely within his or her top 10. It's simply one of the more persistent maladies of the bentgrasses.

FIGURE 1



Dollar spot injury on select creeping bentgrass cultivars in the putting green study in Manhattan, Kan., on Oct. 2, 2009. Plots in the top row were treated with fungicide only on July 7, 2009.

PHOTOS BY: COLE THOMPSON

DOLLAR SPOT MANAGEMENT

Though cultural strategies may limit injury from dollar spot, fungicides often are required for successful management. However, the repeated use of site-specific chemistries has led to the selection of populations of the dollar spot pathogen that are resistant to some active ingredients. You can reduce dependence on fungicides by establishing bentgrass cultivars that are less susceptible to dollar spot infection. Researchers have shown that less-susceptible cultivars delay disease development, ultimately limiting the annual number of fungicide applications required for acceptable control.

So, what's the best way to select a cultivar? Each of the previously mentioned studies evaluated a few cultivars at one location in separate experiments. Data from the National Turfgrass Evaluation Program (NTEP) are more widespread and useful for assessing many traits of interest but still are not ubiquitous. Traditionally, scientists and superintendents work around this challenge by assuming that the relative resistance to dollar spot observed at one location is consistent over other locations. In 2008, my colleagues and I set out to determine

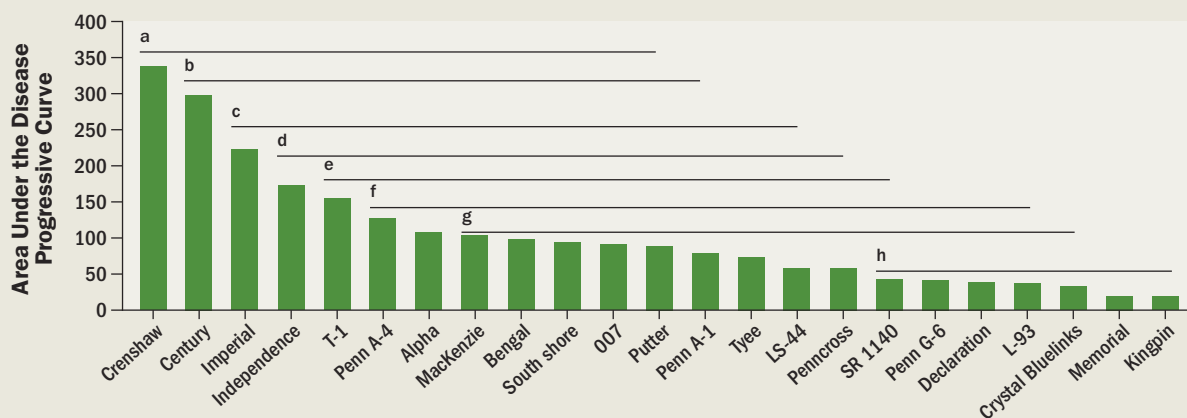
Continued on page 68

TABLE 1**Bentgrass cultivars used in putting green and fairway evaluations**

Cultivar	Species	Release date	Seed source
007	<i>Agrostis stolonifera</i>	2006	Seed Research of Oregon
Alister†	<i>A. capillaris</i>	2002	Tee-2-Green
Alpha	<i>A. stolonifera</i>	2004	J.R. Simplot
Bengal	<i>A. stolonifera</i>	2002	Barenbrug USA
Century	<i>A. stolonifera</i>	1998	ProSeeds Marketing
Crenshaw	<i>A. stolonifera</i>	1993	ProSeeds Marketing
Crystal BlueLinks	<i>A. stolonifera</i>	2007	Tee-2-Green
Declaration	<i>A. stolonifera</i>	2005	Lebanon Seaboard Company
Imperial	<i>A. stolonifera</i>	1998	ProSeeds Marketing
Independence	<i>A. stolonifera</i>	2002	Lebanon Seaboard Company
Kingpin	<i>A. stolonifera</i>	2006	ProSeeds Marketing
L-93	<i>A. stolonifera</i>	1995	J.R. Simplot
LS-44	<i>A. stolonifera</i>	2003	Links Seed
MacKenzie	<i>A. stolonifera</i>	2006	Seed Research of Oregon
Memorial	<i>A. stolonifera</i>	2004	The Scotts Company
Penn A-1*	<i>A. stolonifera</i>	1995	Tee-2-Green
Penn A-4	<i>A. stolonifera</i>	1995	Tee-2-Green
Penn G-6*	<i>A. stolonifera</i>	1995	Tee-2-Green
Penncross	<i>A. stolonifera</i>	1955	Tee-2-Green
Pennlinks II†	<i>A. stolonifera</i>	2004	Tee-2-Green
Putter	<i>A. stolonifera</i>	1989	J.R. Simplot
Southshore	<i>A. stolonifera</i>	1992	J.R. Simplot
SR1150	<i>A. stolonifera</i>	2006	Seed Research of Oregon
T-1	<i>A. stolonifera</i>	2004	J.R. Simplot
Tyee	<i>A. stolonifera</i>	2006	Seed Research of Oregon

† Alister and Pennlinks II were included only in the fairway trials.

* Penn A-1 and Penn G-6 were included only in the putting green trials.

FIGURE 2

Dollar spot injury (measured as an area under the disease progress curve) for bentgrass cultivars at putting green height and without fungicide treatment. These data are a mean of responses in Kansas and Wisconsin in 2009, as well as Kansas, Iowa, Oklahoma and Illinois in 2010. Means under the same horizontal bar are not statistically different according to Tukey's honest significant difference test ($P \leq 0.05$).

Continued from page 67

this for 25 bentgrass cultivars in five states in the Central United States.

REPLICATED PLOTS

We seeded replicated plots of 24 creeping bentgrass (*A. stolonifera*) cultivars and Alister colonial bentgrass (*A. capillaris*) at 44 lbs. per acre in Iowa, Illinois, Kansas, Oklahoma and Wisconsin in fall 2008 or spring 2009 and irrigated and fertilized appropriately through 2010 (Table 1).

We conducted experiments at putting green cutting heights (0.125 or 0.1875 inch) and fairway heights (0.5 inch). Within experiments, each cultivar was split into two plots — one never received fungicide, but the other received a tank mix of boscalid (Emerald 70 WG, BASF Corp.) at 0.36 lb. a.i./acre plus chlorothalonil (Daconil Ultrax 82.5 WG, Syngenta) at 7.14 lbs. a.i./acre in 87 gallons of water per acre. We initially applied the fungicide mix to all fungicide-treated plots at first appearance of dollar spot symptoms in Crenshaw, a highly susceptible cultivar. Subsequent applications followed for all fungicide-treated plots whenever dollar spot symptom coverage exceeded the 5 percent in Declaration (a partially resistant cultivar) putting green plots or 10 percent in Declaration fairway plots. Only putting green studies in Iowa and Oklahoma and the fairway study in Iowa received more than one fungicide application per year based on these thresholds.

CONSISTENCY OF RELATIVE SUSCEPTIBILITY

The severity of dollar spot injury varied for bentgrass cultivars within experiments and was generally less with fungicide applications and in the putting green study. Overall, however, a cultivar's relative susceptibility to dollar spot injury was similar in putting green and fairway experiments with or without fungicide applications. Kingpin and Memorial had the least dollar spot injury under all

scenarios (putting green and fairway, with and without fungicide), and Crystal BlueLinks, Declaration, L-93 and SR1150 were consistently similar (Figures 1 and 2).

Crenshaw and Century had the most dollar spot injury in all scenarios and were never in the same statistical group as any of the previous cultivars. Further, dollar spot injury data were positively correlated (> 0.94) with all evaluated management scenarios across all locations, which indicates that genetic differences in dollar spot susceptibility were consistent in each experimental location and management scenario. Thus, golf course superintendents should feel comfortable using NTEP or similar data to assess relative dollar spot susceptibility of bentgrass cultivars, even when close-proximity data are not immediately available. **G**

Acknowledgements

We extend thanks to colleagues who cooperated on this research and to Barenbrug USA, Lebanon, Links Seed, Proseeds, Scotts, Seed Research of Oregon, J.R. Simplot, Tee-2-Green, Spring Valley and BASF for seed, fertilizer and fungicides used for this project.

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Winter injury becomes apparent in the spring when turfgrass comes out of winter dormancy.

Winter injury: Multiple causes, same result

Winter injury in turfgrass actually is a catchall term for several different causes, according to Karl Danneberger, Ph.D., professor of turfgrass at The Ohio State University. These causes can include freeze injury, winter desiccation, winter diseases and low-temperature kill.

It's fairly easy to diagnose turf with winter injury as grasses come out of dormancy.

"You see them in the spring when everything else is greening up, and the turf is just whitish brown in color," he says. "There's not a whole lot you can do. Especially with warm-season grasses, you can try to cover it, warm it up and get it to grow."

Danneberger says you can take a sample of turf that's suspected to have winter injury, put it in a warm place and watch for symptoms as it grows out. Another way to diagnose winter injury is to check the viability of the crown.

"The crown is always hard to find, but if you squeeze it, and it's still hard and white, that plant will come back even if the leaves are dead," he says. "If it's mushy or dark colored, that plant is probably dead."

The best defense against winter injury is to have healthy warm-season turf.

"Adequate potassium levels — applied in fall — can help with reducing the likelihood of winter injury or helping bermudagrass get through the winter," Danneberger says.

Covering also is an option for ultradwarf bermudagrass, especially in areas like Kentucky and Tennessee.


"If you cover bermudagrass in the fall and have it covered for a prolonged period of time, that plant is not going to harden off," he says. "Keep that in mind when you uncover." 

PHOTO COURTESY OF JOHN KAMINSKI

PBI-Gordon Corp.

ERIC REASOR

Southeast research scientist



Winter injury is the result of exposure to low temperatures, soil moisture, humidity, wind, shade and disease pressure. Symptoms can include thin and chlorotic turfgrasses in irregular patches. On warm-season turfgrasses, symptoms will not appear until spring when noninjured turfgrass resumes growth and damaged areas do not. For preventive winter injury management, raise the mowing height, limit nitrogen fertilization in fall, promote soil drainage, limit compaction and ensure proper irrigation. On putting greens, a light sand topdressing can help reduce desiccation by protecting the crown and the turfgrass plant. Wetting agents and soil surfactants have been shown to help with winter injury. Warm-season turfgrasses are less tolerant to winter injury. Lower-mowing-height areas are more susceptible to winter injury. Covers can be effective, especially for warm-season putting greens grown in the Transition Zone.

Nufarm

RICK FLETCHER

Technical services manager,
turf and ornamentals



Winter injury can include cold-temperature fungal diseases, crown dehydration or desiccation, ice encasement damage and direct low-temperature kill. For cold-temperature and ice damage, the turf when moist often displays a flat, gray, water-soaked appearance that later dries into a compressed mat on the soil surface. For injury related to disease, consider a timed application of preventive fungicides. For desiccation-related injury, make changes in fall cultural practices and use protective covers and heavy sand topdressing. Fungal damage often recovers after spring green-up, whereas crown desiccation and anoxia may require overseeding, aeration or more vigorous measures. The three grasses commonly associated with winter injury are bentgrass, *Poa annua* and warm-season grasses grown in the upper end of the Transition Zone. Desiccation can be more pronounced on open areas lacking snow cover or elevated areas exposed to dry winds. Historically, the use of wind breaks, topdressing or turf covers can reduce this exposure.

Syngenta

LANE TREDWAY

Technical services manager



There are a number of fungal diseases that could be considered forms of winter injury. Symptoms range from distinct patches or rings caused by take-all or spring dead spot to irregular areas of thin, weak turf. On bermudagrass putting greens, diseases like take-all root rot, spring dead spot, leaf spot and *Pythium* begin in late summer and may continue through the fall and winter. All warm-season grasses become more susceptible to disease from fall through spring. Ultradwarf bermudagrasses are at particularly high risk. Fewer diseases have been observed on zoysiagrass greens. Covers are an important tool in helping protect warm-season greens from cold-temperature injury. However, fungal diseases can become active under covers, especially if they are left on during the day and canopy temperatures underneath get to 50-60 degrees F.

Quali-Pro

IAN RODRIGUEZ

Technical services manager
Control Solutions Inc.



Common signs of winter injury may include leaves or crowns that appear water-soaked or whitish, progressing to dark brown. Damaged turf can become matted and may produce a rotten smell. Preventive practices include fall fertility to ensure ample potassium is available and avoiding high rates of nitrogen. Raising mow heights in late summer and early fall helps the turf produce and store more carbohydrates, which increase cold tolerance. Avoid excessive thatch buildup, which leaves crowns exposed. Addressing drainage issues to prevent pooling or waterlogged soil after a thaw will help avoid crown hydration. If enough turf survives to avoid the need for replacement, provide good growing conditions once you're confident the last of the cold has passed. Cold damage may be more severe on north-facing slopes and shaded areas. Compacted, poorly drained areas and green edges with a lip preventing good surface drainage also are more prone to cold injury. Covers can be helpful by providing an insulating airspace and preventing desiccation by wind.

Kyllinga species a challenge to control

Scott McElroy, Ph.D., is a turfgrass weed scientist at Auburn University. He conducts numerous weed control experiments every year, targeting many weeds species, including kyllinga species. You may reach him at jsm0010@auburn.edu for more information.

Q What are the most troublesome kyllinga species on golf courses in your area?

In Alabama, the most troublesome kyllinga species are green kyllinga (*Kyllinga brevifolia*), false green kyllinga (*Kyllinga gracillima*) and cockscomb kyllinga (*Kyllinga squamulata*). Of these three species, cockscomb kyllinga is the most difficult problem.

In addition to the kyllinga species, there also are several species of annual sedge that can be a problem in turf in some areas.

Q What is the life cycle of these species, and is there a weak point in the life cycle when they can be easily controlled?

We are only beginning to learn the details of these species and how they behave in turf. Based on what we know today, green kyllinga and false green kyllinga both are perennials that spread by seeds and rhizomes. The seeds are viable and may be the mechanism of transfer from one location to another, while rhizomes allow green

and false green kyllinga to spread and form dense mats once they become established on a site. Green and false green kyllinga are found on greens, tees, fairways and rough.

Cockscomb kyllinga is an annual and spreads by seeds. It does show some characteristics of behaving as a short-lived perennial under certain conditions. Cockscomb kyllinga is found in fairways and rough.

We have not identified a weak point in the life cycle of any of these species that can be exploited to make control more effective. There is not a period of definitive seed germination, which makes using preemergent herbicides a challenge. Kyllinga seeds will germinate from mid-April to August, with the bulk of seeds germinating in June and July.

Q Why have kyllinga species become more of a problem the last 15 to 20 years?

The duration and intensity of high summer temperatures have increased, which creates growing conditions favorable for kyllinga species.

These species used to be found only in coastal areas of Alabama 20 years ago and are now found throughout the state. It's not clear how the kyllinga species are being spread throughout the state.

Q Are there any cultural practices to help control kyllinga species?

Kyllinga species grow best in wet areas, so improving drainage will help reduce the problem in wet areas, and reducing thatch also will reduce the kyllinga population. Other than that, we have not identified any other cultural practices to help control kyllinga species.

Q What herbicide strategies work well to control kyllinga species?

Traditional preemergent herbicides work well to control kyllinga species, but the challenge is the long time period during which kyllinga seeds germinate. Two applications of a preemergent herbicide to control crabgrass and goosegrass also will control kyllinga species, but when the effectiveness of those two applications wanes, the kyllinga species seeds will germinate.

An effective control strategy is to apply two ap-

plications of a traditional preemergent herbicide in spring and around June 1, or as soon as superintendents see kyllinga species starting to germinate, apply a third application of a preemergent herbicide in combination with a postemergent herbicide labeled for kyllinga control.

As the growing season progresses, keep scouting for just-emerged, small kyllinga plants and apply a postemergent herbicide as needed.

Q Is there anything else you would like to add?

For long-term control of kyllinga species, work diligently to prevent the kyllinga species from producing seed. It's possible to get a large infestation of kyllinga species under control using a sound herbicide control program and being persistent. Once kyllinga species are present on a golf course, herbicides are needed every year to prevent large infestations from recurring. **G**



Clark Throssell, Ph.D., loves to talk turf. Contact him at clarkthrossell@bresnan.net.

TARGET SPECIALTY PRODUCTS' TURF FUEL

A trio of treatments

To solve Baker Hill Golf Club's turf issues, Bob Turcotte is using Cleanse, MZ-23 and Element 6

After attempting to solve a variety of issues (from localized dry spot to algae) at Newbury, N.H.'s Baker Hill Golf Club without the success he had hoped for, Superintendent Bob Turcotte decided to experiment. He turned to three of Target Specialty Products' Turf Fuel products: Cleanse, MZ-23 and Element 6.

The experiment began in spring 2019, when Turcotte applied two treatments of Cleanse at a rate of 5 ounces per 1,000 square feet two weeks apart. During the second treatment, he decided to add a wetting agent. Because of the success of the treatment, including the addition of the wetting agent, he continues to apply Cleanse to Baker Hill Golf Club's greens and tees (twice during the fall and twice in the spring).

"Early on, I had a few gallons of Cleanse and wetting agent left in my spray tank, which I applied to a couple dry fairway spots I was having issues with," he says. "After a week, I could clearly see the turf recovering when compared to the adjacent areas I hadn't treated."

Before he started using Cleanse, localized dry spot would reappear like clockwork a few weeks after he applied wetting agents alone. But since experimenting with Cleanse, Baker Hill Golf Club hasn't had any localized dry spots.



"Cleanse is now the most important part of our water management plan on greens and tees," he adds.

In addition to Cleanse, Turcotte began to apply MZ-23 — at a rate of 4 ounces per 1,000 square feet — on Baker Hill Golf Club's greens this spring. Used to help improve root health and stress conditioning as part of the club's liquid fungicide program, MZ-23 enhanced turf quality enough to keep algae out, despite an extremely wet June.



Bob Turcotte

"I'm convinced that the components of MZ-23 kept the greens clean of algae, an issue that Baker Hill Golf Club encounters every year," he stresses. "In the past, I had to apply a fungicide labeled for algae in addition to routine sprays. But that won't be necessary anymore as I no longer have to apply that fungicide."

Because of Baker Hill Golf Club's location in



the Northeast, Turcotte also must prepare for harsh winters. To ensure the club is ready for any weather conditions, he applies Element 6 at a rate of 6 ounces per 1,000 square feet during his last two fungicide sprays in the fall.

For the first application, he combined Element 6 with Civitas as a pre-snow mold application prior to a late-season venting with 0.25-inch solid tines. During the second application, he used Element 6 with Instrata, along with Turf Fuel's Base K26, for his final snow mold treatment of the fall.

"We try to be as proactive as we can to help our greens escape the wrath of winter," he says. "Element 6 does the trick, since the greens remain clean from snow mold and, in turn, stay healthy as winter approaches."



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StihlUsa.com

The 19th Hole

Garrett Luck

CGCS // Hidden Glen at Bentdale Farms, Cedarburg, Wis.

Garrett, what can I get you?

My go-to, a Tanqueray and tonic.



Tell me about your family.

My wife, Ann, and I will celebrate seven years of marriage this weekend. And we have two kids: Taylor, who is a senior in college, and Caden, who is a freshman in college. And also, we have a baby on the way, due in February.

That's great, congrats! How did you and Ann meet?

After I moved back to Milwaukee from Kansas City, I was hired as the assistant superintendent at North Shore CC (Mequon, Wis.), and Ann was the assistant GM there. We met, and the rest is history! She's still in the business. She's now the general manager at Milwaukee CC.

How did you get into the business?

I worked as a dishwasher at age 14, and I did that until I was old enough to drive.

At 16, I knew I wanted to work at a job where I could be outside. I took a job on the crew and worked my way up as guys would graduate high school and move on to college.



Washing dishes at age 14? That's rough. I liked money too much, and my parents wouldn't ever give me any.

Tell me about your course. It's an interesting place, unique in that it is privately owned by a great family. It's a

// BEST ADVICE

"I PREACH TO MY KIDS TO JUST BE PRESENT. SHOW UP TO CLASS, SHOW UP TO MEETINGS, SHOW UP ON TIME. I THINK 90 PERCENT OF IT IS JUST SHOWING UP."



hidden gem in Wisconsin, designed by P.B. Dye. Next year, we'll celebrate the course's 20th year.

What's your favorite vacation spot?

Last year, my daughter studied abroad in Australia, so my wife and I went to visit her there, and then went to New Zealand. I think New Zealand is the most amazing place on the planet.

You're a Kansas State Wildcat, right? I am, and I worked in Kansas City for a few seasons. It was a good move, coming home. I always tell people that Kansas City is one of the most difficult places to grow grass.

What do you love about living in Milwaukee? It's a great town, a great

food scene, a great live music scene. The largest music festival in America is here every summer (Summerfest). You'd love it, lots of '90s alternative grunge bands play there—I saw Pearl Jam there right after *Ten* came out. And the summers are great here. Don't ask me about the winters.

Fill in the blank: I know it's going to be a good day when _____. When I can have the top off on my Jeep on the way to work in the morning.

With the last name Luck, do you consider yourself a lucky person?

I have great kids, a great wife and I love what I do. I'm probably blessed ... I feel lucky every day.

As interviewed by Seth Jones, Dec. 13, 2019.



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*– Zachary Reineking
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Photography by Paul Hundley

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