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03.24

PLUS

Preventing anthracnose
GCSSA Conference recap
Nitrogen + creeping bentgrass

The buzz on bunkers

What to consider when choosing
liners, plus a successful bunker
reduction in Illinois

No. 12 at Golden Valley CC,
Golden Valley, Minn.

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No. 12 at Golden Valley CC,
Golden Valley, Minn.

A detailed view of a Smithco Spray Star 1200 sprayer machine. The machine is primarily orange and white, with a black frame and a large, adjustable spray boom extending upwards and outwards. It features a steering wheel, a seat, and various control panels. The background is a dark blue gradient with a large, stylized white star graphic. The machine is positioned on the right side of the frame, angled towards the left.

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The labor is less and the golfers are “pumped” at Lick Creek GC in central Illinois, thanks to a bunker reduction

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Trent Inman, CGCS
Superintendent
Dunwoody Country Club, GA





“Evey wasn’t having any of it. She insisted something bad was happening. And sadly, she was right.”

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

One week in Kansas City

A week ago, I was welcoming guests to my home for a Super Bowl party. It was the same crew from last year — Ted and Heather and their kids, Sean and his girlfriend and the neighbors. I guess we’re all a bit superstitious because it seemed like everyone was trying hard to repeat what we did last year, hoping that would help the Kansas City Chiefs repeat what they did last year.

And they did! What a thrilling, edge-of-your-seat game. So many things had to go right for them to pull off the win, and somehow, it all went right. I pulled out my one leftover firework from the 4th of July that I hid away last summer. We all ran outside to set it off and celebrate the back-to-back Super Bowl wins for the Chiefs.

The parade was scheduled for Wednesday. The weather was ideal, mid-60s. I was on deadline for the magazine and big crowds like that aren’t my thing, so I didn’t entertain the idea of taking my kids to it. I did record it. My plan was to have it on as background noise as I wrote up some of

the contents of this issue in the afternoon.

My kids got off school early that day and saw me working on the magazine in the Hall of Justice — HOJ for short — my Morton Building I’ve turned into my own personal sports bar (you’re always invited, just give me a heads-up). On the big TV, I had just pushed play on the parade, so it was over two hours behind. The smaller TV was on the live feed and it was muted. My kids wanted to hear Patrick Mahomes’ speech and asked me if I’d flip the audio from one TV to the other. We watched a few of the speeches together. When it ended, I walked back to the house to

fetch something from my office. I came back to see my daughter with a scared look on her face. “Dad, something bad is happening,” she said. Me being an eternal optimist, I said to her, “It’s probably nothing. Maybe someone set off fireworks.”

My daughter Evey wasn’t having any of it. She insisted something bad was happening. And sadly, she was right.

What went from a happy watch party with my kids turned into a reminder of how quickly things can turn violent. Gunfire did indeed erupt at the parade, with dozens shot and one person killed. My plan to write pages of this issue with the parade on as

background noise changed. I turned off both TVs and went back into the house to write this issue’s 19th Hole Q&A with Grant Jones. I was grateful I had that interview at the ready because I was able to wrap myself into that project and get my mind off what I just saw.

Once I clocked out for the day, I got wrapped back up into the TV coverage. Maybe because it was my city or my team, it all hit me very hard. Was I even allowed to be happy that the Chiefs won the Super Bowl anymore, or did I need to put it behind me?

At dinner, I asked the kids, “Can you believe the Super Bowl party was last Sunday?” Everyone agreed that so much had happened in a week, it seemed longer ... two weeks ago, maybe three weeks ago. But last Sunday? No way.

I’m flying out tomorrow morning, and I’ll already be driving to the airport before anyone is awake. I’m attending a three-day conference in Austin. After dinner ended, as is tradition when I’m not going to see my family for a few days, I gathered the group in the kitchen for a “family hug.” As we all embraced, the family mutt, Koko, jumped into the middle, making us all laugh.

Win or lose — I sure prefer winning — but everything is all right when we’re all together and safe. For these moments, I’m most grateful. **©**

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Starter

NEWS, NOTES AND QUOTES



//THE FACE OF PINEHURST

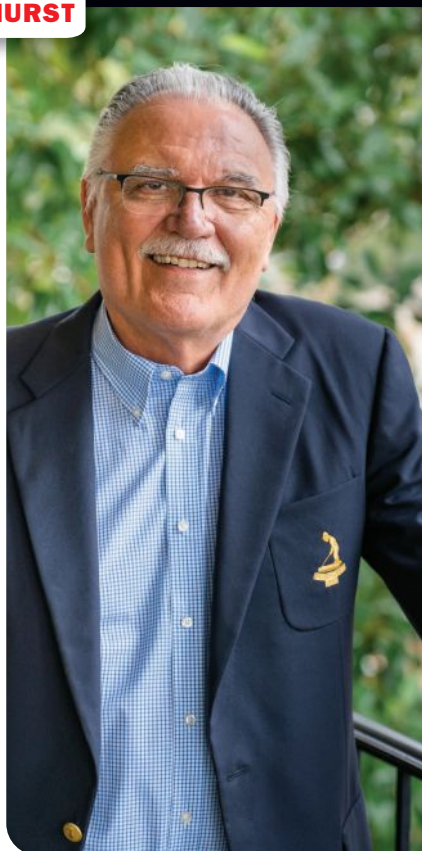
BOB FARREN NAMED GREEN SECTION AWARD WINNER

➔ The USGA announced the recipients of its annual awards, honoring Bob Farren, CGCS, director of golf course management at Pinehurst Resort & Country Club with the Green Section Award for serving as a leader in sustainable golf course maintenance practices.

“This year we celebrate barrier-breakers, innovators and individuals who have witnessed – and overcome – great challenges in their respective fields of the game,” Mike Whan, USGA CEO, said.

Farren began his 40-year career in golf course management in 1979. Three years later, he joined Pinehurst Resort & Country Club and advanced to his current role as director of golf course management in 2001. Since that time, Farren has been a principal force behind a dedicated effort to restore Pinehurst’s historic architecture while advancing the environmental and economic sustainability of its now 11-course footprint.

Those efforts have included reducing more than 40 acres of irrigated turf in favor of sandscapes that feature native wiregrass, converting greens and fairways to more drought-tolerant turfgrasses, eliminating overseeding



throughout the property and championing training for his team.

He was also a principal founding partner of the Greenkeeper Apprenticeship Program (GAP), launched at Pinehurst last year with the USGA and Sandhills Community College providing education and mentorship for golf course maintenance workers. For more on the GAP, read the January 2024 issue of *Golfdom*.

Among the 11 USGA championships Farren has worked at Pinehurst, one of his team’s most significant agronomic accomplishments was in delivering a consistent playing experience for the back-to-back 2014 U.S. Open and U.S. Women’s Open in consecutive weeks.

//A FRIEND IN NEED

SUPER HOSTING FUNDRAISER IN HONOR OF HIS DAUGHTER

Shawn Marcellus, superintendent at Wanumetonomy G&CC in Middletown, R.I., and a Friend of *Golfdom* is hosting a special fundraiser to benefit The Stiff Person Syndrome Research Foundation.

Stiff Person Syndrome is a rare neurological autoimmune disorder that causes the muscles to stiffen up or spasm. Marcellus’ daughter, Isla, was diagnosed with the disorder at just 18 months old.

Marcellus and the Research Foundation will host the event at Wanumetonomy, at a date to be determined, with golf, a silent auction and a goal of raising \$10,000. The event is seeking sponsors to donate player gifts, food and more. Anyone interested in helping can email Marcellus at Shaun@wanumetonomy.com.

Readers can learn more about Marcellus and his daughter by reading the 19th Hole Q&A in the April 2022 issue of *Golfdom*.

//BOILER UP

PURDUE TAKES HOME TURF BOWL CROWN

Students from Purdue University won the 2024 Collegiate Turf Bowl at the 2024 GCSAA Conference and Trade Show. Sponsored by John Deere, the winners received a traveling trophy and \$4,000.

The 2024 turf bowl brought together 63 student teams representing 28 colleges and universities from across the United States.

John Deere crowned Purdue for their industry knowledge

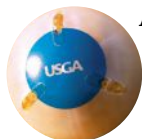
and problem-solving skills demonstrated through a variety of tests designed to showcase participants’ performance in high-pressure situations that closely mirror those faced by supers every day.

This year, Deere awarded a total of \$10,000 in cash and prizes to the top teams in the competition.



//GET 'EM WHILE THEY'RE HOT

GS3 NOW AVAILABLE FOR PURCHASE



A year after the USGA unveiled the GS3 ball at the 2023 GCSAA Conference and Trade Show in Orlando, Fla., the ball

is now available for U.S. superintendents to purchase.

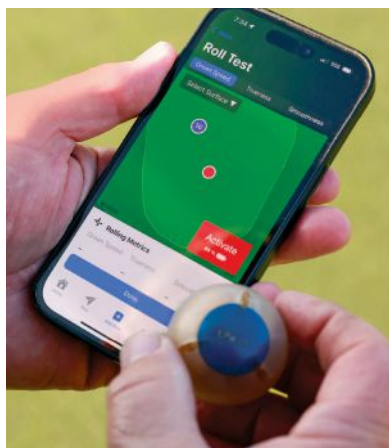
The GS3 is a rechargeable smart ball that is the same size and weight as a standard golf ball that calculates green speed, firmness, smoothness and trueness.

In conjunction with the Deacon app, the GS3 ball provides immediate data on key surface performance metrics. These insights inform the entire facility's golf course maintenance staff how each surface is performing, creating accurate, measurable, agronomic benchmarks that superintendents can use to facilitate change more effectively on their course.

Since announcing the product last year, the USGA has focused on quality testing, data validation and internal

adoption at USGA Championships. The USGA demoed the GS3 in late 2023 at Pinehurst Resort and Country Club — to learn more visit [Golfdom.com](https://www.golfdom.com).

Included in the GS3 Starter Kit are the GS3 Ball and Charger, a Deacon subscription, a USGA Stimpmeter, a drop fixture, an EnkaMat and capture tray, a clipping yield volume bucket and USGA agronomist support.



//RISING TIDE

RISE DISCUSSES PESTICIDE AND FERTILIZER REGULATIONS AT GCSAA SHOW

RISE (Responsible Industry for a Sound Environment) hosted its first Industry Issues Update of 2024 during the GCSAA Conference and Trade Show in Phoenix.

The breakfast forum convened industry leaders and GCSAA members nationwide to discuss RISE's priority issues and stress the pivotal role of grassroots engagement in shaping the future of the golf and specialty pesticide and fertilizer sectors.

"You are the experts. Policymakers and regulators need to hear from you about the benefits of pesticides and the robust regulatory framework that supports their availability and responsible use," Megan Provost, president of RISE, said. "As leaders, it is crucial we align our priorities and work collaboratively to address the challenges and opportunities before us."

Mitch Savage, CGCS, superintendent at CommonGround GC in Aurora, Colo., and David Robinson, CGCS, senior director of golf grounds for Marriott Golf in Orlando, Fla., shared their first-hand advocacy experiences, encouraging members to engage in grassroots efforts with RISE and their respective states.

//DREAM TEAM

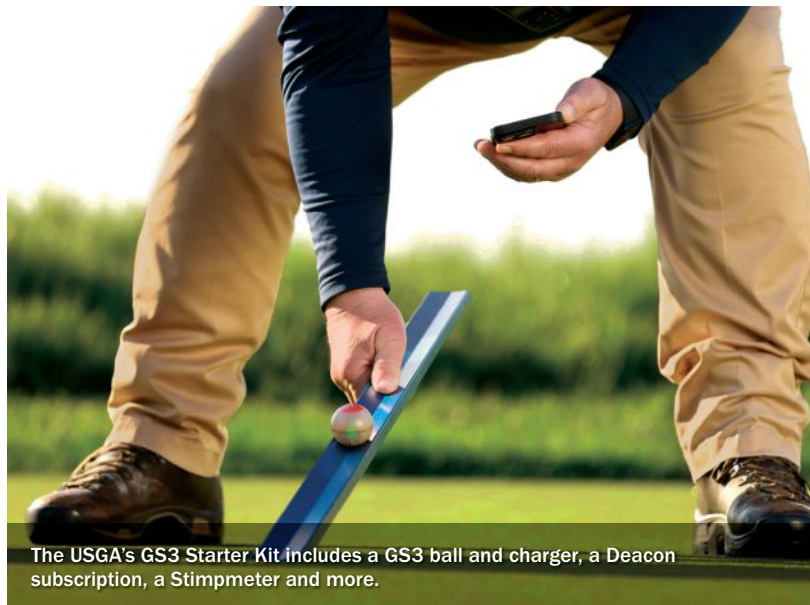
SYNGENTA LAUNCHES NEW TEAM AFTER SPIIO COLLAB

Syngenta recently launched its new Digital Platforms team, which will serve turfgrass professionals with its Spiio precision agronomy system. This comes following the recent announcement of a collaboration between Syngenta and Spiio to provide precision soil sensor technology and agronomic data for turf managers.

The Digital Platforms team will market, sell and support the Spiio technology as part of the U.S. Professional Solutions businesses.

The new team includes:

- **Steve Dorer**, head of digital platforms
- **Scott White**, digital platforms marketing manager
- **Travis Roberson**, digital platforms field technical manager
- **Kevin Cooper**, digital platforms sales specialist
- **Lorabeth Catterson**, digital platforms sales specialist



The USGA's GS3 Starter Kit includes a GS3 ball and charger, a Deacon subscription, a Stimpmeter and more.

//IN MEMORIAM

FORMER EWING PRESIDENT, RAY YORK

Raymon Alan "Ray" York, former president and CEO of Ewing Outdoor Supply, died Jan. 24, 2024, after a brief illness. He was 86.



Ray York

York was born August 4, 1937, in Wichita, Kan., and grew up in Twin Falls, Idaho. He and his wife and business partner of 63 years, Susan "Sue" Ewing York, met at Stanford University in the spring of 1959. The pair welcomed twin sons, David and Douglas, in 1961 and younger son, Richard, in 1963.

In December 1963, they went to San Francisco to take over Ewing's daily operations from King William Ewing, Sue's father and the company's founder. They officially retired in 2023.

Ray is survived by his wife, three children and their spouses, six grandchildren, one great-grandchild; and his sister, Marjorie Crosby.

//COMING SOON

USGA FUNDS NEW BATCH OF RESEARCH THROUGH DAVIS PROGRAM

The USGA Mike Davis Program for Advancing Golf Course Management has funded 15 new research projects to advance turfgrass science in 2024, taking the program's total investment in golf course sustainability over \$50 million since 1983.

Aligning with the USGA's long-term \$30 million commitment to reduce golf's use of water, more than 50 percent of active Davis Grants are focused on projects intended to drive efficiency, effective measurement, innovation and conservation of water on golf courses. They include multi-year studies on optimizing irrigation techniques, improving drought resistance for common fairway, rough and green turfgrasses and advancing methods of renovating out-of-play areas to conservation habitat.

Other notable projects receiving funding this year include a pilot effort at Texas A&M University and the University of Tennessee to mine Google course review data to better understand what improves and detracts from the golfer experience.

//TEA TIME

GCSAA and Bernhard partner to send US supers to '25 BTME conference

➔ Bernhard Academy partnered with the GCSAA to create Links to Success United Kingdom 2025 and bring 10 GCSAA members to the annual BTME conference in the United Kingdom, beginning in 2025.

For the last 23 years, Bernhard has selected 10 members of the British and International Golf Greenkeepers Association (BIGGA) to attend the GCSAA Conference and Trade Show in the U.S. to take part in education and visit local golf courses. The new program will give North American superintendents the opportunity for a similar experience in the UK.

Steven Nixon, managing director for Bernhard, and Kevin Sunderman,

CGCS, GCSAA COO, announced the program during the 2024 GCSAA Conference and Trade Show in Phoenix.

"Whether you are an assistant or superintendent, or hold any other role within the greenkeeping world, we welcome you to take part in this process. The delegation promises to deliver invaluable benefits for everyone involved," Nixon said.

GCSAA members chosen will attend the BTME 2025 conference in Harrogate, England, be part of the Bernhard Academy and visit various golf courses to expand their knowledge and network. Applications will open from March 1 through May 31 on [GCSAA.org](https://gcsaa.org).

X #TurfPostoftheMonth

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Eric Johnson

@altshot2

Director of Agronomy at Chambers Bay, University Place, Wash.

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Dylan Dreyer, Meteorologist, Today

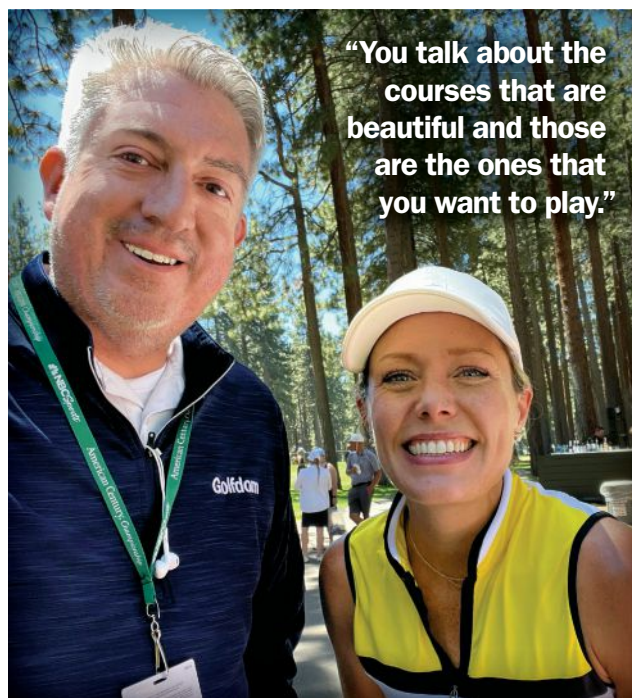
WHILE MOST superintendents are already in their second or third hour of work, more than 2.7 million Americans are tuning into *Today*, or *The Today Show*, as it's commonly known. The show offers a mix of the day's headlines as well as the weather across the nation. Fans of the show are familiar with the friendly faces of hosts Savannah Guthrie, Hoda Kotb and Al Roker.

Another one of the hosts has a passion for golf — Dylan Dreyer, who serves as co-host of the show and regularly reports on the weather. She has also reported on the Kentucky Derby, the Olympics and the Macy's Thanksgiving Day Parade. Dreyer, a Rutgers University graduate, has been playing golf regularly for 10 years.

— **Seth Jones** // Editor-in-Chief

"I just love being outside for hours. I'm not a hiker, so I feel like this is my version of hiking, and I've made so many friends. It's given me the chance to come to events like (the American Century Championship, Edgewood Tahoe South, Stateline, Nev.) and meet new people. The girls I'm playing with are really good and we're competitive, and I love everything about it.

(Conditions) make a difference. I don't know if it's just my luck, but whenever I book a tee time it's always after they punch the greens. But, as a meteorologist, I know that it's necessary to make the courses beautiful and it makes a difference.



"You talk about the courses that are beautiful and those are the ones that you want to play."

The courses you talk about the most are the ones that are the most beautiful. There's a course down in Turks and Caicos, so it's in the Caribbean, yet you can't see the water — you feel like you're landlocked. You talk about the courses that are beautiful and those are the

ones that you want to play.

Tell *Golfdom's* readers that I appreciate them all. One thing I'd ask them all to consider is the number of women's restrooms on the course, because that is one thing we could use their help with."

//KING OF THE HILLS

GCSAA ELECTS NEW PRESIDENT AND BOARD MEMBERS IN PHOENIX

 Jeff White, CGCS, director of agronomy at Indian Hills CC in Mission Hills, Kan., is the new president of the GCSAA. White began his one-year term at the association's annual meeting on Feb. 1, held in conjunction with the GCSAA Conference and Trade Show.

White is the 87th president in the association's history. He previously served as vice president in 2023.

White is also a former president of the Heart of America GCSA.



Jeff White

In addition to White, delegates elected T.A. Barker, CGCS, superintendent at Fore Lakes GC in Taylorsville, Utah, as vice president, and Paul Carter, CGCS, superintendent at The Bear Trace at Harrison Bay in Harrison, Tenn., as secretary/treasurer.

Board members Douglas Dykstra, CGCS, superintendent at White Mountain CC in Pinetop, Ariz., and Marc Weston, CGCS, superintendent at Indian Hill CC in Newington, Conn., were re-elected to serve on the board, while Gregory Jones, CGCS, MG, director of agronomy at Champions Run in Omaha, Neb., was newly elected to join the board as a director.

Steven Hammon, superintendent at Traverse City (Mich.) CC, and Scott Griffith, CGCS, director of agronomy at the University of Georgia GC, in Athens, Ga., continue their service on the board. Kevin Breen, CGCS, superintendent at La Rinconada CC in Los Gatos, Calif., will serve as immediate past president. Breen served two terms as president.

Golfdom Gallery

GCSAA
Conference and Trade Show
EDITION



1 A space odyssey At the PBI-Gordon party, Bill Roddy (left) and Rob DiFranco met the Arkon mascot himself. Or is it herself?



2 Darius is rock chalkin' What's one surefire way to get your photo in *Golfdom*? Wear something with Editor-in-Chief Seth Jones' beloved Jayhawks logo, as Darius Lane of John Deere did here, alongside Sam Guinan, IMRE and Craig MacGregor.



3 The President and the COO enter a room ... Kevin Sunderman, CGCS, GCSAA COO (left), with newly elected GCSAA President Jeff White, CGCS, director of agronomy at Indian Hills CC, Mission Hills, Kan.



4 This is the team in black The *Golfdom* team was not offering personal security at the GCSAA Conference and Trade Show in Phoenix, but based on this photo it looks like they could have. From left to right are DiFranco, MacGregor, Jake Goodman, Roddy, Jones, Nader Hassen and Sydney Fischer.



5 How about those Chiefs? A bet's a bet. Here's Thad Thompson, superintendent at Terry Hills GC, Batavia, N.Y., paying one off. The Chiefs/Bills game forced Thompson, a proud member of the Bills' Mafia, into a Chiefs jersey at the *Golfdom* party.



6 Hot dice! Mark Boyd, Quali-Pro president, set aside his day job to play dice with attendees.



7 Vote for Wilson (Left to right) James Hemphling, Ph.D., and Mark Brotherton from Envu and Nancy Cienfuegos and Rick Mooney of Whitetail Club in McCall, Idaho, were happy to see Mooney's dog win the GCSAA dog of the year competition.



8 Friends of *Golfdom* We stopped Marc Logan, founder of Green Lynx Golf, with Rees Jones, ASGCA and Bryce Swanson, ASGCA, of Rees Jones Golf Course Design, to capture this moment in time in Phoenix.

PHOTOS BY: *GOLFDOM* STAFF

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The Golfdom

FILES

FROM THE ARCHIVE

In the February issue of *Golfdom*, we introduced you to the Super-Scratch Foundation — a group looking to build interest in the career of golf course superintendent among young people. Looking back to the May 1967 issue of *Golfdom* a Minnesota superintendent shares his thoughts on the “golf course superintendent supply squeeze.” To read the full article, visit Golfdom.com.

The super's future in golf

BY JOHN L. KOLB, SUPERINTENDENT, MINNEAPOLIS GC, ST. LOUIS PARK, MINN.

In this age of mass disobedience, let me stumble into an area where angels tremble and express a few thoughts about the mechanics of the contemporary golf club. Whether it is the curse of modern affluence or just maladjustment of a fast-changing industry which contributes to the present situation, I am not absolutely sure.

Andrew Bertoni tells the story about the newly elected club president who, meeting the golf course superintendent for the first time, asked how long he had been at the club.

“Twenty years,” was the reply.

“That’s odd,” said the club president. “I have belonged to this club for that many years, but you do not look familiar.”

This is not an isolated case. It is safe to say that at least 60 percent of the membership of the average club do not know their superintendent. The blame for this does not lie with the member nor the superintendent. The golf course superintendent is not engaged in personal contact as is the golf professional and the club manager.

Your golf course superintendent is probably a humble man, for hard work plus the uncertainties of working with nature teaches a man a measure of humility. That is not to say that he is “con-



fused” because he very well could be the only employee on the entire staff of golf club employees with a college degree and, more than likely, it will be an agricultural Bachelor of Science degree.

Golf clubs are in a golf course superintendent supply squeeze. Most older established golf clubs are reaching maturity along with their superintendent. The rate of retiring or dismissed older superintendents is alarming and most are being replaced with very young men who have some form of college training, either the two-year associate degree or the full four-to-five-year courses leading


to a B.S. degree. Besides the retiring and dismissed superintendent replacement, there is the need for more men in the 450 new courses being built annually.

What are golf courses doing to attract good men? — A report on a study of 300 of the nation’s agricultural colleges, published this year by McGraw-Hill, says: “The heads of some of the departments of horticulture, agronomy and soil science ... report that they are unable to fill more than one-third of the demand ... for B.S. graduates.”

Why aren’t more men zeroing in on the myriad opportunities available in agriculture in general and turf work in particular? One problem is “image.”

Turf work is associated with the term “greenkeeper” which is further associated with subservient work. Image, however, is not the only deterrent.

The bidding for graduates of agricultural colleges has not yet reached the frenzied pace set by the Green Bay Packers for football talent. However, fertilizer, chemical and allied companies are scrambling as never before to keep up with the growing need for technical personnel. The result is a rising salary scale and a wider job selection for the graduate with golf courses running a poor last in the bidding.

Professor Ralph E. Miller, Placement Director for the Institute of Agriculture at the University of Minnesota, says, “There are at least five and, most times, six jobs for every graduate of agricultural sciences.” Professor Miller also points out that recruiting and interviewing of graduates is on a year-round basis (not just spring graduates) and has increased 75 percent in the past year. Throw in the bidding of highway departments, institutions and government and the results for golf courses are inevitable. 



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Licking a bunker problem

BY SETH JONES



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PHOTO BY: CASEY SMITH

The labor is less and the golfers are “pumped” at Lick Creek GC in central Illinois, thanks to a bunker reduction

Greg Funk has seen a lot of golf over his 48 years in the business. He started at age 16, running a hand mower at Lick Creek GC, Pekin, Ill. He’s made various moves over the course of his career but always stayed in golf. Both the game and the business

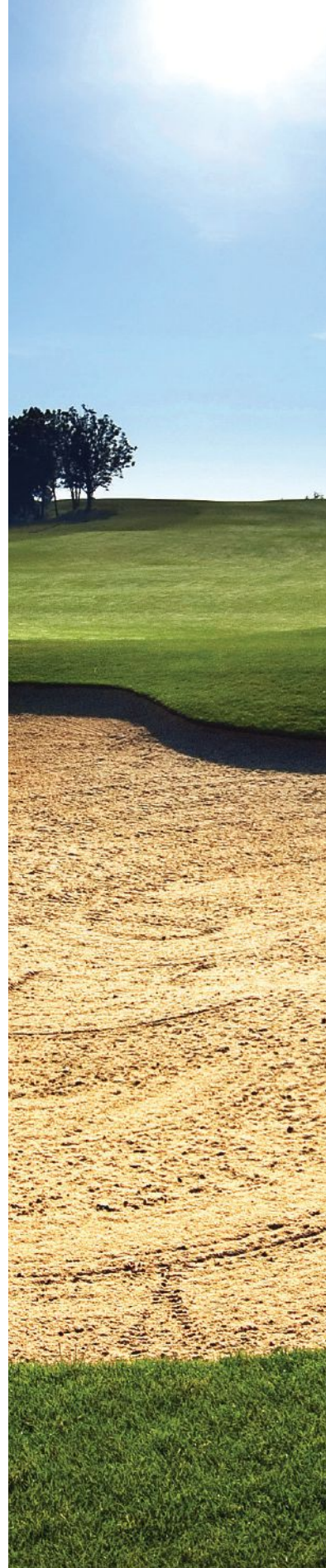
have also made changes over those 48 years, Funk says.

“I still hold a grudge against Arnold Palmer because Palmer started the Golf Channel, and when golfers got to see golf 24 hours a day, that

Continued on page 16



The closing hole at Lick Creek GC in Pekin, Ill., is a 502-yard par 5 with a carry over water.



// BUNKER FOCUS

Continued from page 15

upped what they expected of us,” Funk laughs.

Now, at age 64, he’s back where he started and ready to semi-retire. As a grand finale to his career, he can say he made a positive impact on the look of Lick Creek GC by reducing the course’s bunkers.

“I thought the bunker project was fantastic. I loved doing it. I was 16 years old; they were building a golf course and I worked here 10 years. And then I left and went into being a superintendent and sales and stuff,” Funk says. “Five years ago, I came back and it’s great to

finish my career up where I started. I enjoyed doing the project. I look forward to it because



Greg Funk

I love improving the golf course. I’ve got my life in this thing.”

Less is more

Located south of Peoria, Ill., Lick Creek is known locally as the place to get a good test of your game.

The greens are fast and the fairways are nar-

Continued on page 18



Larry Denton Golf Course Construction created the plan for the bunker renovation, shaped the bunkers and installed new drainage.

PHOTOS BY: CASEY SMITH

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TSP GOLFOOM MAR23 R1_1-24



Local high school golf and hockey teams lent a helping hand to the maintenance team at Lick Creek GC assisting with laying sod and installing the new sand.



Continued from page 16

row. Cory Proehl, PGA, director of golf for the Pekin Park District, which includes Lick Creek GC and Parkview GC, doesn't hesitate to say it's one of the best and most challenging courses within 100 miles in any direction.

"It's one of the toughest tests of your game you can find," Proehl, who has worked for Pekin Park District for five years, says. "From the back tees, you're looking at just under 7,000 yards and 140 for slope. Larry Packard designed it. When it was built, it was in the top 75 of *Golf Digest's* public courses."

While Funk and his crew were doing good work keeping the course in fine condition, considering the size of the crew and maintenance budget, the bunkers became problematic for the course. They were too big, too deep and sometimes misplaced.

As Funk says, that's just the way courses were built in the 1970s.

"We had one bunker on No. 8, which is a par 3. It was probably 120 feet long and I had a maintenance rake as a kid and I couldn't reach the bottom of it from the top of it to rake the bank. Granted, I wasn't very big at the time, but I mean, still," Funk says. "Looking at what we did this year, we wanted to make, basically, a flat bottom bunker because we couldn't afford (bunker liners) and we're trying to keep the sand as clean as we can and trying to lower maintenance costs."

Funk and Proehl put their heads together to form a plan for reducing the size and the number of bunkers on the course. Players were supportive and the maintenance team welcomed the idea of less bunker area to maintain.

Larry Denton Golf Course Construction created the plan for the bunker renovation, shaped the bunkers and installed new drainage. From there, laying sod and installing the new sand was performed entirely in-house, lowering square footage from 75,000 square feet of bunkers to 48,000 square feet. The team at Lick Creek removed 14 bunkers entirely, going from 59 down to 45. The project took two waves and approximately four months to complete featuring 638 tons of White Pro Angle Sand. The Lick Creek maintenance team put in 650 hours of labor in laying, stapling and watering sod. They also got an assist from the local boy's golf and hockey teams. Volunteers from Pekin Community High School came out and lent their muscle to the course.

Ready to rock

Lick Creek will reopen with its new bunkers on April 1. At the end of last season, nine bunkers were ready for play. Golfers were pleased with the sneak preview of what was to come.

"Golfers were ecstatic. It's all they could talk about last year," Proehl says. "These guys are pumped. They're ready to rock. They're ready to play."

Funk says the new course setup will make the course more enjoyable for the high-handicap players, but will also offer something to the lower-handicap players.

"A lot of the bunkers we took out, we felt hurt the higher-handicap player a lot of times because of the change in the game. Some of the fairway bunkers, the good players, they're 50

Continued on page 20

PHOTOS BY: CASEY SMITH

THE BUZZ ON BUNKER LINERS

Kevin Norby says when it comes to what's best, these are the questions to ask

Kevin Norby, ASGCA, principal/project architect for Norby Golf Course Design, says the most commonly asked question he gets is, "What is your preferred system for a good bunker liner that will last?"

The problem, he says, is there isn't a clear answer.

"I get calls all the time, 'Hey, I saw your post (on social media). Can you tell me about that bunker liner?' I think they're just the buzz right now," Norby tells *Golfdom*. "I always end up telling them that every system has its pros and cons. Some of them are more expensive; some of them are easier to install. Some of them you can install yourself. At the end of the day, it's really a function of the superintendent, the budget and how many he has on his staff."

By asking a few questions himself, he can perhaps help narrow down the selection. He asks if the superintendent's crew plans to hand-rake the bunker or use a motorized bunker rake. Are they considering using the Aussie style? What's the climate like? What is the budget?

Norby says if there is any trend with bunkers right now, it's restoring them to their original look.

"This has been going on the last 10 to 15 years. Golfers are much more in tune to the history of the course," he says. "You're seeing a lot of superintendents and clubs interested in sort of putting the course back to its original intended style or character."

In many cases, this means removing a flash-sand face and replacing that area with grass. Norby likes to warn that the grass faces on bunkers are more difficult to maintain than flash sand.

"Provided that the bunker is constructed properly, it's more labor intensive to maintain those grass faces because you have to string trim them, you have to hand mow them, and then you have to blow the clippings out," he says. "That's more labor intensive than dealing with flash sand."

— S.J.



Kevin Norby



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// BUNKER FOCUS

Continued from page 20
yards past it. They don't even look at that fairway bunker," Funk says. "We felt taking those and some bunkers over the green or on the high side of the green out, would actually make the shot more challenging for the low-handicap golfer."

Funk's crew uses a motorized bunker rake on most bunkers, while a handful are small enough to be hand-raked. He told the hockey and golf teams that if they wanted a job, they needed to put it on their application that they volunteered on the bunker project and he'd hire them. He's hopeful three or four of them will take him up on the




Norby Golf Course Design worked on Eau Claire G&CC in Wisconsin. Pictured here is the par three No. 16.

offer. Of course, now that Funk is retiring from the full-time superintendent to part-time, those students will report to someone else.

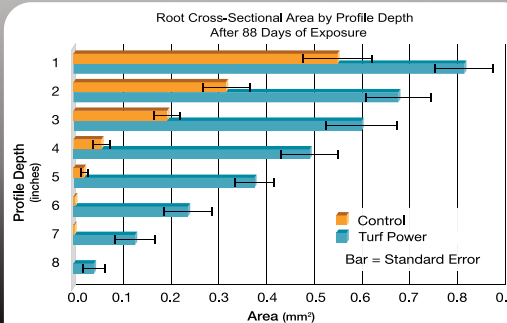
It's been a good career, Funk says, but he's happy to take a step back now. **G**

PHOTO BY: EVAN SCHILLER




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After 88 Days of Exposure




Profile Depth (Inches)	Control (mm²)	Turf Power (mm²)
1	0.55	0.85
2	0.30	0.70
3	0.20	0.60
4	0.10	0.50
5	0.05	0.40
6	0.02	0.25
7	0.01	0.15
8	0.01	0.10


Bar = Standard Error




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Highlights from sunny Phoenix

BY SETH JONES

A sold-out trade show floor that spanned 325,000 square feet. 6,600 seminar seats sold, the most since 2008. 470 exhibitors displaying their cure for anything and everything that ails a superintendent.

The return to Phoenix was pretty good all-around for the nearly 11,000 turf professionals who made the trip to the 2024 GCSAA Conference and Trade Show.

If you did or didn't make it, we encourage you to keep an eye on our *Golfdom* Insider e-newsletter, and our website, **Golfdom.com**. Our team captured more than 20 videos with exhibitors in an effort to spread the word about the many new tools available to the industry.

Here's a short recap of two highlights from the show, as well as a quick report from our advice columnist, Thad Thompson.

Rees Jones presents Herb Graffis Award

For the 12th consecutive time, Rees Jones, ASGCA, one of only three people to win the Old Tom Morris Award (2004), the Donald Ross Award (2013) and the Don A. Rossi Award (2014), was on hand at the *Golfdom* booth to present our own award: the Herb Graffis Businessperson of the Year, named after the magazine's World Golf Hall of Fame founder.

"I'm definitely a friend of *Golfdom* magazine. Herb Graffis was a dear friend of our family. He is one of the most humorous people I've ever met in my life," Jones told the audience. "I met him as a young man. He was a friend of my father's, Robert Trent Jones. He and Joe Graffis started *Golfdom* magazine, that's why this award is so appropriate and so significant; it's annually given to a participant who does something special in his career."



It was all smiles at the *Golfdom* booth as Chris Navin received his Herb Graffis Businessperson of the Year award at the 2024 GCSAA Show.

The recipient was Chris Navin, superintendent at the Golf Club at P.B. Dye in Ijamsville, Md. We profiled Navin in the August 2023 issue of the magazine. In Phoenix, we officially recognized him for his hard work restoring the Club at P.B. Dye to its former glory.

"What Herb Graffis decided to do years ago, starting *Golfdom*, writing about what goes on on the golf course, really has paved the way for a lot of great publications to highlight what we do," Navin said. "Everything from the guy on the course running the string trimmer to the people at the universities doing research and everyone in between. We get to see through *Golfdom*, all the research, all the hard work. And it's because of Herb Graffis."

That's so (turf) rad

Over at the taskTracker booth, we saw something new. What was the purpose of that big rectangle attached to the back of a fairway mower?

Lars Horvat, chief technical officer of Ter-

Continued on page 22

Including
a new
technology,
an old
friend and
a report from
our advice
columnist

Continued from page 21

raRad Tech, was in from Switzerland to explain.

"We invented a new kind of soil moisture sensor that can measure soil moisture without touching the soil," he said. "It's measuring 4 inches deep in the soil and it's doing it with microwave technology that is normally used in satellites. We just made that technology cheaper and much smaller."

It's known as turfRad (visit turfrad.com to learn more and yes, the lowercase t pains us). Last year was the product's pilot year, with 16 American golf courses trying it. This year, they're ready to roll it out to the entire industry.

"Our goal is to save water, but you can improve your playability a lot," Horvat says. "It's used by the PGA Tour Agronomists and Thomas Bastis. They use it in the week leading up to the Tour event. Our data can drive irrigation decisions — where to water, how to send out hand waterers, to have the most uniform (course) and the best playability. If you have great playability and uniformity, you're also going to save water."

One of the 16 pilot courses is Longboat Key (Fla.) Club, where John Reilly is the director of agronomy. Better known as [@turf-](https://twitter.com/turf-)

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Ask Thad

BY THAD THOMPSON

Superintendent
Terry Hills GC, Batavia, N.Y.



Aside from the overall networking and camaraderie, did anything stand out to you at GCSAA C&S?

The GCSAA Conference and Trade Show is something I look forward to every year. Yes, I get to catch up with friends and colleagues from all over the country. I get to spend time with family and local friends in a different professional setting than at a local chapter meeting. I also get to see how our business has grown and expanded both professionally and in importance. It's great to see our side of the profession being respected and represented in all facets of the golf business.

Something that stood out to me was how many vendors participated in the trade show. I didn't see any empty booths and the vast trade show floor had an almost carnival atmosphere. On Wednesday the trade show was mobbed. I did a lot of walking, observing and getting a feel for where everyone was located. Thursday is my day at the trade show, I rolled up my sleeves and got to work. I took in a couple of seminars at Hector's Shop, I got the QR codes for my SIP Grinders and I voted for Lita's boyfriend Wilson at the Lebanon Turf booth. I had hours of one-on-one conversations with vendors. I enjoy putting a face and name with a company. It helps in networking, and it makes it personal. I'm not shy about asking questions about any product that I consider using and walk away with the information that I need and the follow-up contact information. Thank you to all the vendors who put up with my questions! As an industry, we can't and won't thrive without the support of every vendor. Hat's off to you all.

Another thing that is capturing my attention is the Turf Bowl. Seeing the knowledge and passion the next generation has is truly astounding and our profession will be in good hands for years to come. My nephew, Brenden, is a turf student at SUNY Delhi. My brother, Drew (his father), and I attend the closing celebration every year to listen to the results. SUNY Delhi came in 10th out of 63 teams. The GCSAA Conference and Show is turning into a family affair for the Thompsons.

Got a question for Thad? Tweet to [@TerryHillsMaint](https://twitter.com/TerryHillsMaint) and [@Golfdom](https://twitter.com/Golfdom) or email Thad at thadthompson@terryhills.com

monkeyboy on X, previously known as Twitter (and yes, that also pains us), Reilly tells *Golfdom* that when he first saw it, he thought it was meant for California, or for superintendents who have to buy water. Then he saw it in action at Muirfield Village and was "instantly hooked." He adds that turfRad shows him what really needs to be watered, while also giving him bouncy conditions on sticky Paspalum grass.

"We've long been an early adopter of technology-based data collection to make turfgrass management decisions. We started with point-of-reference measurement devices like meters and soil sensors, and made global decisions," Reilly says. "The turfRad is the exact opposite with instant information to make point-of-reference decisions, which turns out to be much more impactful. We save exponential watering with accurate point management." 



Super Science

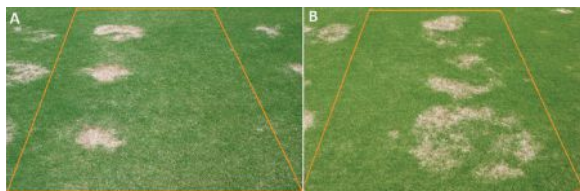
// THE BERMUDA RESEARCH TRIANGLE

EXAMINING SPRING DEAD SPOT RESPONSE TO DIFFERENT MANAGEMENT PRACTICES

By Mike Kenna, Ph.D.

Hybrid bermudagrasses are highly susceptible to the destructive fungal disease spring dead spot (SDS) in areas where cold or freezing temperatures occur. Three species of *Ophiosphaerella* are known to cause SDS in the U.S.: *O. korrae*, *O. herpotricha*, and *O. narmari*. Past research by pathologists finds *O. korrae* and *O. herpotricha* are commonly isolated from infected patches.

Researchers at North Carolina State University, in cooperation with Syngenta Crop Protection, evaluated the effects of nitrogen (N) source, fall fertilization and preventive fungicides on common bermudagrass artificially inoculated with *O. korrae* and *O. herpotricha*.



Response of spring dead spot caused by *Ophiosphaerella korrae* (left side of each plot) and *O. herpotricha* (right side of each plot) to nitrogen (N) sources as observed on May 1, 2009. Plots received (A) ammonium sulfate and (B) calcium nitrate as the sole N source in 2006, 2007 and 2008.

Spring dead spot pathogens respond differently to management practices. For example, they evaluated preventive fungicides to control SDS effectively. Preventive applications of propiconazole, both propiconazole and azoxystrobin, tebuconazole or fenarimol provided effective control of *O. herpotricha* but failed to provide significant suppression of *O. korrae*.

The researchers also evaluated N sources (ammonium sulfate or calcium nitrate) to suppress the SDS pathogens. The source of N applied to bermudagrass from May to Aug. 2006-2008 significantly affected SDS symptoms in the spring of 2007-2009.

Ammonium sulfate $[(\text{NH}_4)_2\text{SO}_4]$ provided excellent suppression of *O. herpotricha* but did not affect *O. korrae*. However, *O. korrae* was suppressed instead by calcium nitrate (CaNO_3). Fall applications of K, S, gypsum or dolomitic lime did not influence SDS development.

The differential response of SDS pathogens to fertilization practices and preventive fungicide applications highlights the importance of pathogen identification in developing integrated management programs.

More research is needed to determine the underlying mechanisms responsible for the suppression of SDS with N sources and the potential role of manganese and calcium in disease development. ©

Adapted from Tredway LP, Soika MD, Butler EL, Kerns JP. Impact of nitrogen source, fall fertilizers, and preventive fungicides on spring dead spot caused by *Ophiosphaerella korrae* and *O. herpotricha*. *Crop Science*. 2021;61:3187-3196. <https://doi.org/10.1002/csc2.20306>



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

NEWS UPDATES

ALBAUGH TO LAUNCH NEW DMI FUNGICIDE IN LATE '24

Albaugh Specialty Products recently announced the EPA registration of Prothioconazole 4L Select, a DMI fungicide that delivers preventive and curative control of many cool- and warm-season turf diseases.

In addition to control of dollar spot, fairy ring, brown patch, anthracnose, gray leaf spot, snow mold and other turf diseases, Prothioconazole 4L Select is labeled for use on greens, tees, fairways and roughs with reduced risk of turfgrass growth regulation commonly associated with other DMI fungicides.

"With Prothioconazole 4L Select, superintendents get a complete fungicide package with low use rates and broad-spectrum disease prevention," Russ Mitchell, director of Albaugh Specialty Products, said. "Prothioconazole 4L Select is also the first prothioconazole alternative that offers the same 4 pounds-per-gallon active ingredient concentration found in Densicor, delivering low-cost efficacy and high-value disease control on courses."

Prothioconazole 4L Select is a complementary addition to the full product portfolio and will be available this spring exclusively through the Albaugh Specialty Products distribution network.

UNDERSTANDING HOW WATER AVAILABILITY INFLUENCES CREEPING BENTGRASS TISSUE NITROGEN CONTENT IS NECESSARY FOR PRECISE MANAGEMENT."

Qiyu Zhou, Ph.D., and Douglas J. Soldat, Ph.D.
(see story on page 24)

// CREEPING INTO FOCUS

A look at factors impacting tissue N content in creeping bentgrass

By Qiyu Zhou, Ph.D., and Douglas J. Soldat, Ph.D.

This study aimed to quantify how different nitrogen (N) application rates, foot traffic intensities, soil volumetric water content (VWC) and weather factors influence the tissue N content of Focus creeping bentgrass (*Agrostis stolonifera* L.).

Tissue N content indicates N removal in clippings from putting greens. We wanted to understand the factors controlling turfgrass tissue N content to help superintendents determine the average tissue N content.

Often, superintendents apply a moderate N rate to limit the turfgrass growth rate which keeps turfgrass in a state of N deficiency. Most superintendents make N application decisions based on their subjective assessment and usually do not quantify turfgrass growth. However, the use of area-normalized fresh clipping volume to quantify turfgrass growth has become

popular with some in recent years.

Fresh clipping volume and tissue N content can approximate N uptake and removal. However, daily mowing of greens makes tissue N content from each mowing impractical. Instead, the manager may wish to submit a few samples during the year to average the results or assume a tissue N content without sending in a sample.

Studies have documented how weather, traffic and water influence turfgrass growth (2 and 5), but little research has been done on how these factors influence tissue N content.

Foot traffic on putting greens is a major stress on turfgrass and usually harms turfgrass performance (3). Excessive traffic stress can significantly damage turf and reduce turf quality and clipping yield (1,10 and 11). However, there is limited information on if or how foot traffic affects tissue N content.

Water availability is another critical factor for plant growth. Water deficiency can sometimes be the primary growth-limiting factor (7 and 12). On the other hand, excessive irrigation also harms creeping bentgrass growth and visual quality (4). Excessive irrigation can result in increased vulnerability to traffic and disease stress.

Understanding how water availability influences creeping bentgrass tissue N content is necessary for precise N management. Tissue N content is essential for accurately estimating plant N uptake. As data-driven N management continues to grow, there is a need to understand thoroughly the factors affecting turfgrass N status. Therefore, our research investigates the significance of weather, traffic and management factors on tissue N content in creeping bentgrass.

FIGURE 1



Nitrogen is the main factor controlling tissue nitrogen content in creeping bentgrass compared to weather, irrigation and foot traffic.

PHOTO BY: QIYU ZHOU AND DOUGLAS J. SOLDAT

TABLE 1

Statistical analysis of the effects of nitrogen and foot traffic intensities on the tissue N content, normalized difference red edge (NDRE), and turf visual quality of Focus creeping bentgrass collected from June 7 to July 31 2018 on two research greens; means of two research greens are presented.

N rate every two weeks		Clipping N content		NDRE	Turf quality ^a
		Jun-18	Jul-18	June-July 2018	June-July 2018
lbs./1000 sq.ft.	kg ha ⁻¹	percent			
0	0	3.58 c ^b	3.65 c	0.2017 c	4.7 c
0.2	10	3.83 b	3.86 b	0.2220 b	5.6 b
0.4	20	4.14 a	4.18 a	0.2431 a	6.1 a
Traffic rate (rounds per week)					
0		3.83	3.85	0.2443 a	6.3 a
1,800		3.80	3.90	0.2177 b	5.4 b
3,600		3.91	3.94	0.2049 c	4.7 c
Summary of ANOVA effects					
Nitrogen		***	***	***	***
Traffic		ns	ns	ns	***
Nitrogen × traffic		ns	ns	***	***

^a Visual quality was scaled from 1 to 9, where 1 represents completely dead turf, 6 represents the minimally acceptable quality, and 9 represents perfect or ideal turfgrass quality.

^b Values in the same column followed by the same letter or not followed by any letter are not significantly different at $P = .05$ (Tukey's post-hoc test).

*** Significant at the .001 probability level, and ns, not significant.

MATERIALS AND METHODS

During 2018 and 2019, we conducted two field experiments at the University of Wisconsin-Madison O.J. Noer Turfgrass Research and Education Facility in Verona, Wis. The research area was on two Focus creeping bentgrass putting greens on sand root zones constructed following USGA recommendations for putting green construction (13).

We managed the putting greens in the following manner:

- Mowed five days per week at a height of cut at 0.125 inches (3.2 mm)
- Irrigated daily to replace evapotranspiration (ET) estimated by an on-site weather station (except when irrigation was a treatment.)
- Fertilized with 10 applications of 0.2 lbs. per 1,000 ft² (10 kg ha⁻¹) of N as urea (except when N fertilizer was a treatment.)
- Topdressed with 0.3 yards³ per acre (0.6 m³ ha⁻¹) of sand approximately every three weeks during the growing season.
- Hollow-tine cultivation once a year at the end of the growing season and filled holes with topdressing sand.

- Controlled diseases and other pests as needed.

The first of two field experiments evaluated the combined effects of foot traffic and nitrogen fertilizer on tissue N content on two greens with 0.6 and 0.9 percent soil organic matter (SOM). We applied N fertilizer at 0, 0.2 or 0.4 lbs. per 1000 ft² (0, 10 or 20 kg N ha⁻¹) every two weeks and maintained foot traffic intensity at three rates: 0, 1,800 and 3,600 rounds per week from May 16 to Aug. 28, 2018 (6). Five researchers wearing golf shoes walked on the plots to simulate traffic.

We collected clippings from each plot in the morning three times a week from June 7 to July 31, 2018 (weather permitting). The effective clipping collection area for each plot was 1.0 m². We brushed clippings from the mower bucket into paper bags and then placed them in a 50 C oven for at least 48 hours. The water method removed sand and debris from dried clipping samples (8). The clippings were then ground into fine powder to determine the total N content in a combustion analyzer with thermal conductivity detection.

Visual turfgrass quality for each plot was evaluated every two weeks from June 7 to July 31, 2018, on a one to nine scale, where one represents completely dead turf, six represents minimally acceptable quality and nine represents perfect or ideal turfgrass quality (9). We recorded the normalized difference red edge (NDRE) for each plot on the same dates.

In the second field experiment, we examined the combined effects of volumetric water content (VWC) and traffic on tissue N content on a green with 0.9 percent SOM. Volumetric water content was maintained at low (12 to 15 percent), medium (17 to 22 percent) and high (25 to 29 percent) levels by hand-watering. We used a FieldScout TDR 350 Soil Moisture Meter with 3-inch rods before each clipping collection event to help maintain the different VWC. Foot traffic intensities were 0, 700 and 1,400 weekly rounds from May 31 to Oct. 4, 2019. We collected clippings and N tissue analysis, as mentioned above.

The tissue N content ranged from

Continued on page 26

TABLE 2

Statistical analysis of the effects of soil volumetric water content (VWC) and traffic intensity on the tissue N content and normalized difference red edge (NDRE) of Focus creeping bentgrass collected from Aug. 1 to Sept. 18, 2019.

	Clipping N content		NDRE
	Aug. 2019	Sept. 2019	Aug.-Sept. 2018
Volumetric Water Content	percent		
Low (12–15 percent)	4.17	N/A	0.2840 aba
Medium (17–22 percent)	4.26	3.93	0.2811 b
High (25–29 percent)	4.09	3.91	0.2967 a
Traffic rate (rounds per week–1)			
0	4.24	3.92	0.2971 a
700	4.10	3.87	0.2875 ab
1,400	4.27	3.95	0.2772 b
Summary of ANOVA effects			
VWC	ns	ns	*
Traffic	ns	ns	*
VWC × traffic	ns	ns	ns

* Values in the same column followed by the same letter or not followed by any letter are not significantly different at $P = .05$ (Tukey's post-hoc test).

* Significant at the 0.05 probability level, and ns, not significant.

Continued from page 25

2.5 to 5.0 percent (average: 3.9 percent). The N fertilizer rate was the main factor controlling the tissue N content, but foot traffic and VWC had no impact. Temperature, relative humidity and evapotranspiration on the tissue N content also had minimal or non-existent impacts.

RESULTS AND DISCUSSION

The N fertilizer treatments caused small but significant differences in the tissue N content in clippings collected on two greens in June and July 2018 (Table 1). The SOM caused no significant difference in the tissue N content (data not shown). This might be because the difference in SOM between the two research greens was small. Future studies with a wide range of SOM would be needed to investigate the effect of SOM on turfgrass tissue N content.

In this study, on both research greens, doubling the fertilization 0.2 to 0.4 lbs. per 1000 ft² (from 10 to 20 kg ha⁻¹) every two weeks increased the tissue N content by 8 percent, whereas

increasing the fertilization from 0 to 0.2 lbs. per 1000 ft² (0 to 10 kg ha⁻¹) resulted in an increase of 6 to 7 percent in plant tissue N content. There was a relatively strong relationship between tissue N content and N fertilization rate ($R^2 = 0.34$), and N fertilization inherently improved the turfgrass visual quality ratings and NDRE values.

Foot traffic did not impact the tissue N content (Table 1) in the 2018 field study, despite ranging from no to high traffic (3,600 rounds per week). Increasing the traffic intensity decreased NDRE and turfgrass visual quality (Table 1).

In 2019, traffic intensities maintained

at 0, 700 and 1,400 rounds per week also had no statistical influence on the tissue N content (Table 2), and increasing the traffic intensity decreased the NDRE values. These results demonstrated that NDRE might not be an accurate tool for predicting tissue N content, especially across areas that are affected differently by traffic stress. The VWC also did not impact the tissue N content (Table 2).

Overall, weather factors in this study, including the average air temperature, ET and relative humidity, played a small role in controlling the tissue N content collected in 2018 and 2019 (Figure 1). In Wisconsin, the summer range of weather parameters was limited.

Daily average temperatures spanned from 12 to 28 C, mean relative humidity ranged from 57 to 98 percent and ET ranged from 0.2 to 0.7 cm. Over this period, there was a relatively wide range in tissue N content from the individual plots, and the majority of samples fell between 2.5 and 5 percent, with a mean value of 3.9 percent.

CONCLUSION

Nitrogen fertilization was strongly related to tissue N content in Focus creeping bentgrass. Foot traffic, VWC and several weather factors, including temperature, relative humidity and ET, all had slight to no correlations with the tissue N content. The average tissue N content was 3.9 percent under our field experiments various management conditions and weather.

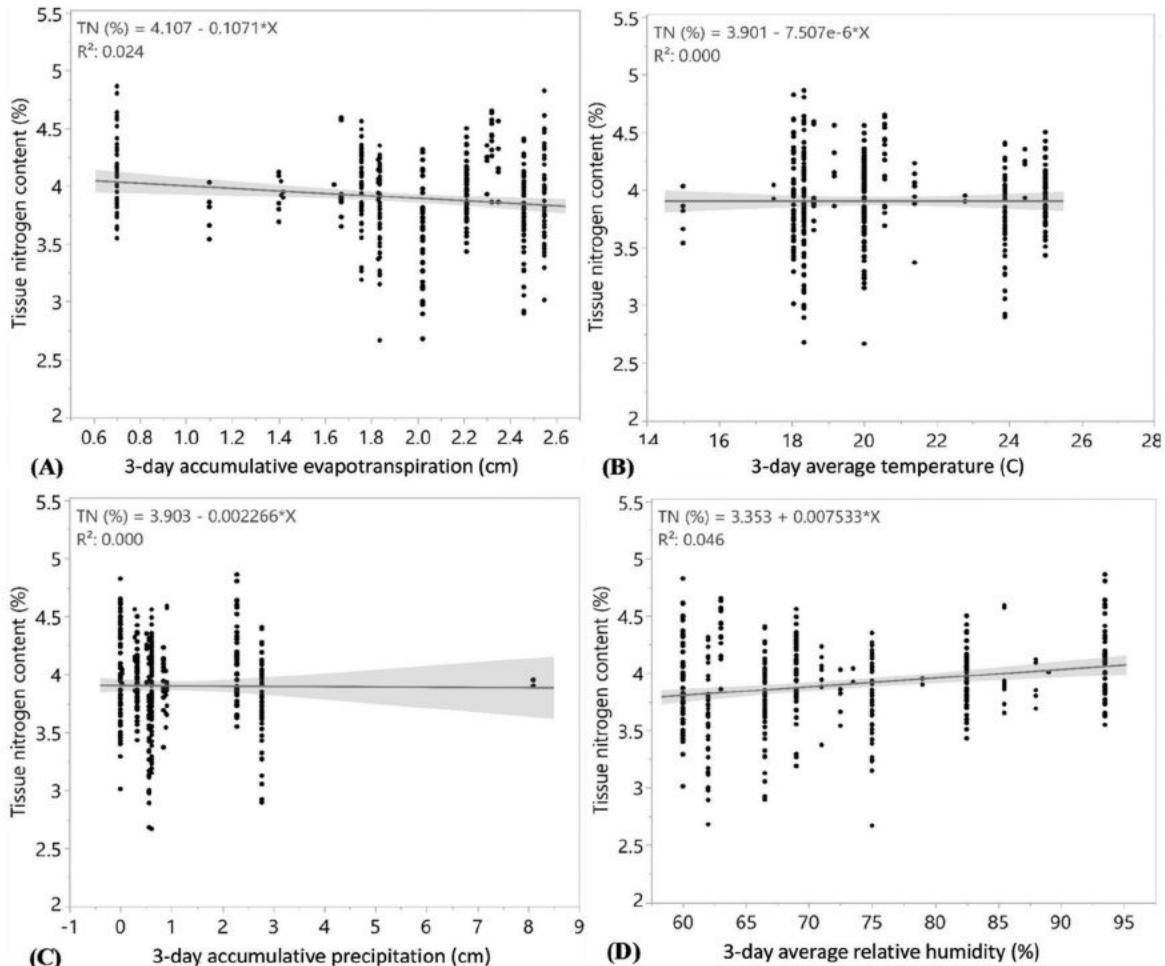
When the N fertilization rate increased from 0 to 0.4 lbs. per 1000 ft² (0 to 20 kg N ha⁻¹) every two weeks, the average tissue N content only increased from 3.6 to 4.1 percent. Our results show that the tissue N content of typically managed creeping bentgrass putting green turf is about 4 percent, and irrigation practices, foot traffic or weather factors do not strongly influence it. Turfgrass managers may be able to determine a robust average tissue N content for their creeping bentgrass putting greens by periodically

Research Takeaways

- Nitrogen (N) is the main factor controlling tissue nitrogen content in creeping bentgrass.
- Weather, irrigation and foot traffic have little impact on tissue N in creeping bentgrass.
- The average tissue nitrogen of creeping bentgrass is about 3.9 percent over a growing season.

FIGURE 2

Relationship between weather factors and creeping bentgrass tissue nitrogen content.



(randomly) collecting samples and averaging them. ©

Adapted from Zhou, Q. & Soldat, D J. Influence of foot traffic, irrigation, nitrogen fertilization and weather factors on tissue N content in creeping bentgrass 'Focus'. *Int Turfgrass Soc Res J.* 2022;14: 560–564. <https://doi.org/10.1002/its2.88>

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The USGA hopes its new testing method will bring consistency to putting green surfaces across the country.

A new standard for measuring organic matter

USGA Director of Agronomy Chris Hartwiger shares an update on the association's development of standardized testing for organic matter on putting greens

By Rob DiFranco

Managing organic matter is crucial to ensuring the best putting green a golf course can offer. Until recently, however, there was no real way to accurately measure the right amount of any given green needs.

Enter the United States Golf Association (USGA), which released its new standard for measuring organic matter on putting greens.

"It's another metric that will help (superintendents)

"THIS IS GOING TO BRING THE INDUSTRY TOGETHER, WHERE WE'LL ALL BE WORKING OFF OF ONE TEST. IT'S GOING TO BE GOOD FOR RESEARCHERS AND THE SUPERINTENDENTS."

understand their putting greens on a deeper level," says Chris Hartwiger USGA director of agronomy. "This is going to bring the industry together, where we'll all be working off of one test. It's going to be good for researchers and the superintendents."

The next step for the research team is to create an American Society of Testing Materials standard by which all labs will utilize the same procedure for surface organic matter determination.

"If you're going to manage something, it's better to have an assigned value," Hartwiger says. "You can actively manage and see the progress you're making. If we can't measure something like organic matter, how do you know if your cultural programs are actually successful?"

For more information on the USGA's new testing method, visit [USGA.org](https://www.usga.org).

PHOTO COURTESY OF: USGA

John Deere

BRAD ALDRIDGE

Golf Reel and Rotary Mowers
Product Manager



Thatch control is important as it helps improve the greens' firmness, smoothness and consistency, which are the playability aspects that golfers value on the course. To help control thatch on greens, a superintendent can develop a regular verticutting and topdressing program. John Deere offers vertical mowing reels for its triplexes, which aid in the removal of thatch from the playing surface. We recommend regular verticutting to get more aggressive with slicing rhizomes and stolons, as this helps to promote new vertical growth and less lateral growth. Another highly encouraged way to contend with thatch is to perform frequent, light topdressing. Many courses are now going once a week to incorporate sand into the canopy in small increments. Additional brushing also helps work it into the course seamlessly. While not performed as often as the rest, but still very important for turf health, aeration is always an important practice to keep thatch off the golf course.

Toro

JEFFREY ISCHE

Senior Product Marketing
Manager for Aeration Products



Thatch control is essential for maintaining the high-quality appearance and playability of a golf course. Similar to a sponge, thatch holds excess water above the soil surface. This results in softer playing conditions and a higher likelihood of disease incidence. When the thatch layer does dry out, it often becomes hydrophobic, leading to problematic localized dry spots that are difficult to rewet. Additionally, mowing areas with excess thatch can lead to a scalped look and an overall poor after-cut appearance. Depending on the aggressiveness one wants to take, there are multiple ways to manage thatch accumulation or remove it. If the current amount of thatch is acceptable, additional accumulation can be limited by managing fertility inputs and incorporating a sand topdressing program to help dilute what is there. If removal is necessary, this can be accomplished in small amounts with hollow-tine aeration, more aggressively with a tractor-powered verticutter, or complete removal with a fraise mower.

Turfco

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Executive Vice President



What superintendents traditionally do is topdress and sometimes aerate. What you're doing with the topdressing is helping it integrate to maintain and control that organic matter. Doing aeration or linear aeration and frequent top dressing can help you control thatch so that you don't get over four percent in organic matter, which might start impacting play.

There are a lot of interesting discussions about the right rates of topdressing applications for thatch management. Now that (the USGA) is coming up with more of a standardized way to calculate your applications or calculate the amount of organic matter, superintendents can start getting more specific with managing organic matter without doing more than needed and disrupting play. There are a lot of different ways to manage it, and I think what people are trying to figure out is, what's the right amount for my course? Because each course is different.

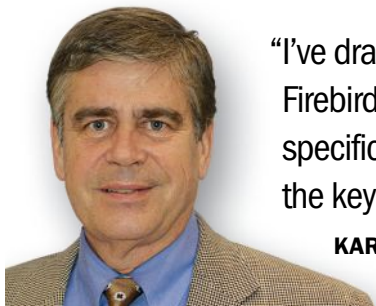
USGA

CHRIS HARTWIGER

Director of Agronomy



Historically, in this industry, a lot of things are done by feel or intuition. We know intuitively that top dressing will dilute organic matter because it's mixed in with it. And we know that when we pull out an aeration core, we've taken some organic matter out. The question then comes, if we've got excellent greens, how much sand do we need to apply over the next year so that we can come back at the same time and have the same conditions? How much, if at all, do we need to aerate? How much nitrogen do we need to add so that we provide the grass with some fuel to recover from traffic and stress, but not so much that it builds up organic matter more than we want? We do a lot of these things by feel, by tradition or by general recommendations. Yes, you should lightly top dress your putting greens every seven to 10 days or you should aerate once or twice a year. But we don't have a level of specificity that I think anybody would desire. So, step one is we need to be able to assign a number to this organic matter level.



"I've drawn some similarities from my Firebird to golf course fertility programs, specifically nitrogen programs. Nitrogen is the key to any turfgrass fertility program."

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

Slow and steady wins the race with nitrogen

Tinkering with my 1960 Pontiac Firebird is a hobby of mine. Over the years, I've made gradual improvements to the car. Now, I'm pretty happy with where it's at. The important thing is it gets me to where I want to go and back with few issues.

I've received outside suggestions for improvement and "stepping up" my engine power. The current engine in the Firebird is the original 350 cubic inch (5.7L) V8 that generates 265 horsepower. Sometimes, I'm tempted to put the Firebird on a dynamometer, but I figure actually knowing the actual horsepower, given the age of the engine, could be depressing.

I've looked at installing a new engine with more horsepower but, for me, it's too expensive. I've thought of installing straight pipes for the exhaust system or replacing it entirely to get a louder sound, which might mask horsepower deficiencies. But that doesn't deal with the core problem.

My last consideration was installing nitrous oxide, which could potentially increase my engine's horsepower by 200. After checking with a few friends who have experience with installing nitrous, I was told you need to know what you are doing. That was a non-starter

for me doing a home installation.

The main reason I opted against nitrous was that if the fuel-to-nitrous oxide ratio is off, engine performance could suffer. For example, too much fuel leads to black belching smoke, while too much nitrous could melt the engine.

TURF SIMILARITIES

I've drawn some similarities from my Firebird to golf course fertility programs, specifically nitrogen programs. Nitrogen is the key to any turfgrass fertility program. It's one of the three primary elements — in addition to phosphorus and potassium — that superintendents apply regularly.

Nitrogen affects shoot and root growth, density and color. Less obvious benefits include the fact that it is a component of nucleic acids, amino acids, proteins, chlorophyll and coenzymes.

Nitrogen's impact on growth, density and color is often a double-edged

sword. On one hand, growth, color and density are signs of a healthy turf. But, on putting greens these characteristics are often associated with hurting green speed. Reducing or avoiding nitrogen is an attempt to increase ball roll at the expense of the health of the turf — or, in my analogy, doing damage to the engine.

Common symptoms of nitrogen being too low, especially on sand-based greens include algae appearing, increased disease pressure and reduced stress tolerance.

Color can be deceiving in the evaluation of the effectiveness of a nitrogen program. Using my masking example from exhaust systems, the applications of plant growth regulators (PGRs) can provide or enhance the green color of the turf and are used as a replacement for nitrogen applications.

The assumption is that the color response can be achieved without causing any growth. The fallacy in this assumption is that PGRs induce the same effects in the plant as nitrogen. The impact of nitrogen and PGRs have little overlap in plant functions. When devising both PGR and nitrogen programs look upon them as additives instead of substitutions.

Extreme changes in one's nitrogen program to achieve a desired outcome, like increased ball roll, often lead to detrimental turf effects over time. Remain cautious with your changes and look for moderate changes in other practices to achieve the desired result.

Regarding my '69 Firebird, I haven't made any of the changes mentioned to increase the horsepower, but I am pretty pleased with where it's at. **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.

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Stopping plant collapse from anthracnose

Experts share the warning signs of anthracnose

By Brian Love, Associate Editor

Though not specifically a pest, anthracnose has proven to act like one over the years. And as spring and summer get closer and closer, it becomes a disease that superintendents will need to keep their eyes on.

What makes this a challenge is, according to James Kerns, Ph.D., professor and Extension specialist of turfgrass pathology at N.C. State, it can be a difficult disease to diagnose.

"It can be challenging if a superintendent has never seen the disease before, so the best thing to do is to submit a sample for a diagnosis," Kerns says. "If the superintendent has a macro-scope, they might be able to see crowns that are water-soaked with acervuli."

Anthracnose, Kerns says, is a disease of foliage and crowns of both cool- and warm-season grasses. The disease manifests as either a foliar blight or rotting of the crown tissue.

Gerald Lee Miller, Ph.D., assistant professor of turfgrass pathology at Purdue, adds that if the disease is left



Gerald Lee Miller

untreated, the turf will become extremely stressed before total plant collapse and dying in larger areas.

"The disease spreads by spores, meaning it moves very rapidly. So, it's pretty widespread in most areas," he says.

WHERE TO SPOT IT

Anthracnose can be a hard disease to diagnose for golf course superintendents. The first question you might have is when should I start looking for it on my turf?



If left untreated for too long, anthracnose can lead to mass destruction of turf on areas like putting greens.

Seen during the summer and early fall, Miller says the stress disease can be most severe on annual bluegrass and cultivars of creeping bentgrass. He adds that superintendents will often find the disease on putting greens.

Miller continues, adding that there are two types of symptoms.

"One type is foliar blight, which is mostly just a yellow cast over the turf grass," he says. "Normally, that is not too severe. But what happens is, when conditions are extremely stressful, we get into a basal rot condition. And that's when the pathogen dives down to the crown of the plant."

According to Peter Landschoot, Ph.D., professor of turfgrass science at Penn State, while the disease is a big problem in the northeast and upper Midwest, its area of effect has recently begun to expand.

"Anywhere *Poa annua* and bentgrass are growing, you can expect to find it," he says.

HOW TO STOP IT

Landschoot thinks back to the '90s when asked how superintendents can stop this disease. During this time, it was popular to put low rates of nitrogen (N) in putting green to increase its firmness.

"University professors and USGA agronomists did a pretty good job of informing superintendents that if they have an anthracnose problem, they better get their N levels up," says Landschoot.

In addition to raising N levels, Miller recommends fungicides.

"The stronger fungicides are DMIs, which have less growth-regulating effects," he says. "It's important to rotate them because some anthracnose populations can develop a resistance."

Finally, Miller recommends raising mowing heights, especially if you know the disease is present.

"I imagine superintendents are tired of hearing to raise mowing heights and add more N, but anthracnose tends to follow stress patterns," Miller says. ©

PHOTOS BY: JAMES KERNS



"Collectively, these studies offer valuable insights into optimizing fertilization practices. The emergence of the SLAN test as a potential rapid soil analysis tool further enhances our ability to guide (nitrogen) fertilization precisely."

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

Important insights from soil nitrogen testing

Turfgrass management, particularly for nitrogen fertilization, has been intensely scrutinized due to environmental concerns. Researchers have explored methods to reduce fertilizer inputs without compromising turfgrass quality. The USGA Mike Davis Program for Advancing Golf Course Management provided funding for studies that shed light on the spatial variation of nitrogen in the soil, the potential correlations between soil tests and turfgrass responses and the effectiveness of new soil tests.

First, let me briefly explain why this research was needed. The research on nutrient fate from several university projects in the '90s and early 2000s was very positive regarding nitrogen (N) leaching from fairway soils. However, the results were surprising when we returned to Michigan State University to evaluate N leaching more than ten years after the experiments.

We saw more nitrogen moving downward to the bottom of the 3-foot-deep lysimeters. Kevin Frank, Ph.D., found an increase in nitrate N (NO_3^-), suggesting that the mineralization of organic-N fractions exceeded the immobilization of fertilizer-N.

In other words, soil N mineralization is a biological process in which organic nitrogen compounds are converted into inorganic forms, primarily ammonium (NH_4^+) and nitrate (NO_3^-), making nitrogen available for plant uptake. This process is crucial for the nitrogen cycle

and impacts soil fertility.

When Frank reduced N-fertilization rates, turfgrass quality had no adverse effect and N leaching diminished. We then asked soil scientists if there was a way to measure the organic N tied up in the soil and encourage the mineralization into plant-available forms.

MORE TESTS

From 2006 to 2007, David Gardner, Ph.D., used the Illinois Soil Nitrogen Test (ISNT) to study nitrogen variation in fairways and address the need for reliable nitrogen tests. Developed by Richard Mulvaney, Ph.D., the ISNT measures stable amino sugar N fractions in soil, predicting season-long N fertility better.

Despite decreasing with depth, Gardner found amino sugar N showed spatial correlation, enabling efficient N assessment through traditional soil sampling. His sampling technique

would permit the identification of fairway areas with higher and lower amino sugar N values and allow for the development of site-specific N application.

From 2002 to 2021, Karl Guillard, Ph.D., took this further to predict turfgrass response to soil organic N. His experiments delved into predicting turfgrass color and growth responses. The research showed promising results using a single spring measurement of ISLT-N and soil permanganate-oxidizable carbon concentrations. He observed positive linear responses, suggesting a single spring measurement could indicate the likelihood of N-fertilization response.

Guillard continued his interest in the potential mineralization of soil nitrogen. He explored the potential of the Solvita Soil Labile Amino-Nitrogen (SLAN) test in turfgrass. His experiments correlated SLAN concentrations with turfgrass responses. While correlations were moderate, specific SLAN concentrations showed a high probability of responses equal to or exceeding benchmark urea rates. His results indicate the SLAN test's promise as a soil test for guiding fertilization.

WORTH THE WAIT

Guillard also investigated the correlation between the ISNT and the Solvita SLAN test. Both tests responded linearly to the fertilizer rate, with ISNT showing a greater rate of change.

Collectively, these studies offer valuable insights into optimizing fertilization practices. The emergence of the SLAN test as a potential rapid soil analysis tool further enhances our ability to guide N fertilization precisely.

By integrating these findings into turfgrass management strategies, we can balance maintaining turf quality and mitigate the environmental impacts of excessive N fertilization. **©**

Mike Kenna, Ph.D., retired director of research, USGA Green Section. Contact him at mpkenna@gmail.com.

The Shop

// MUST-HAVE NEW PRODUCTS

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1 SP-110 Wireless Multi Sensor

The SP-110 Wireless Multi Sensor from **SPIIO** offers four data points and is built to last 20-plus years in the ground. Spiio is a subscription-based agronomy system from Syngenta that provides soil data. Superintendents can view data through mobile or desktop devices and can set environmental thresholds and monitor conditions. The four sensors it offers include soil moisture, temperature, salinity and light. Its connectivity is cellular, delivering these data points through cellphone towers. Spiio.GreenCastOnline.com

2



2 Arkon Herbicide Liquid

PBI-GORDON introduces Arkon Herbicide Liquid for use on established cool and warm-season turfgrass, including greens, fairways and roughs. The active ingredient is pyrimisulfan and provides post-emergent control of sedges, kyllinga, dollarweed and other broadleaf weeds. It has a maximum annual use rate of 2.5 fl. oz. per 1,000 sq. ft. PBIGordonTurf.com

3



3 Big Bite turf tire

The new Big Bite turf tire from **OTR ENGINEERED SOLUTIONS** is designed for zero-turn, stand-on and ride-on mowers. It offers low rolling resistance and protection for turf and grass against damage. There is a specialized thread angle to assist in damp conditions and a side corner lug design for stability. Additionally, it is made from a premium ATV rubber compound and has extra-deep lugs for enhanced wear life. OTRWheel.com

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5



4



6



4 | Drum Mulcher DC Pro

The Drum Mulcher DC Pro from **DIAMOND MOWERS** is equipped with a 63 CC, two-speed, bent-axis piston motor, helping with mulching performances for loaders up to 75 horsepower. Additional highlights include a 50-inch cutting width that can slice and mulch trees up to 8 inches in diameter. There is an infeed system that helps provide the desired chip size and reduces the need for back-dragging. DiamondMowers.com

5 | 6700A and 7700A E-Cut Hybrid Fairway Mowers

The 6700A and 7700A E-Cut Hybrid Fairway Mowers from **JOHN DEERE** have an electric-reel drive and can mow, verticut and scalp. The 6700A is a three-wheel stance fairway mower with 7-inch reels. Both models feature a LoadMatch system, an alternator that helps with cut quality during tough conditions.

JohnDeere.com

6 | Prothioconazole 4L Select

ALBAUGH SPECIALTY PRODUCTS DMI fungicide Prothioconazole 4L Select recently received EPA registration. Prothioconazole 4L Select provides preventive and curative control of cool and warm-season turf diseases, like dollar spot, fairy ring, brown patch and snow mold. Additionally, it is labeled for use on greens, tees, fairways and roughs.

AlbaughLLC.com

The 19th Hole with...



Grant Jones

SUPERINTENDENT // Sherrill Park GC, Richardson, Texas



Grant, drinks are on me ... what are you having? A Half-Life Hazy IPA from the Manhattan Project Beer Co. in Dallas. They've got a couple really good beers and I'm an IPA guy.

Tell me about the courses. We're a 36-hole municipal facility here in Richardson. Course 1 opened in 1973. So last year, we celebrated 50 years. And then, in 1976, Course 2 was built. Both of those were Leon Howard-designed golf courses. And then, in the mid-'90s, D.A. Weibring and Steve Wolfard came in and redesigned both of those. We're the only city course in Richardson.

How big is your crew? My department total is 13, including me. I have one assistant, two mechanics and nine equipment operators that manage all 36 holes and our driving range. Staying on schedule is real important out here. Ron Readell, my assistant, has been here for 31 years. It's great to just give the schedule to him and say, 'Hey, here are some of the things let's try to get accomplished this week,' and off he goes. I don't have to worry about what he's doing or how he's scheduling it.

And you have a young family? Yes, my wife Kelli and I have been married for six years. We have an 18-month-old little girl named Reese. Then we've got Palmer, my dog — she's 12 — a little Lab mix who comes with me to the golf course every single day. Kelli brought her cat into the mix as well, Peanut.

// BEST ADVICE

"WE'RE A LARGE PROPERTY WITH A LOT GOING ON AND A SMALL CREW. I ALWAYS TELL PEOPLE, 'DON'T EVER BE AFRAID TO ASK QUESTIONS.'"

Give me a good recommendation — book, movie, TV show, anything.

Lee Child is one of my favorite authors to read. He's the author of the *Jack Reacher* series — the series on Amazon Prime. It's cool to see the character come to life from the book, it's pretty accurate.

What's your favorite golf memory?

I was an assistant at The Woodlands and we had a Champions Tour event come through. My dad came to town for the weekend. He was able to see the course. Then we sat behind the 18th green and watched the tournament together. It was cool to do the prep, the lead-up and then have him come out and see everything.

Who are your teams and do you have a favorite piece of sports memorabilia?

I grew up in this area, so I love all the local teams: I'm a Cowboys fan, a Rangers fan, the Mavericks and the Stars. The Rangers World Series — that was a long time coming. I've got a signed Ivan Rodriguez rookie card. He was my favorite growing up. Now, he's in the Hall of Fame and that card still has a lot of meaning to me.



Fill in the blank: I love all my golfers, but come March 1, I know I'm going to have to _____? I'm going to have to answer the question, 'When do I pre-emerge my lawn?' I have to give lawn advice and, listen, I don't do the best job with my own yard.

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As interviewed by Seth Jones, Feb. 14, 2024.

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