SINCE 1927—The Resource for Superintendents // Golfdom.com

Golfdom

06.18

PLUS
Fungicide Resistance
Pressure washing greens
Foliar fertilizers and soil nutrients

GOLF'S CAPITOL INVESTMENT

The We Are Golf coalition takes golf's best interests to Washington, D.C.

A NORTH COAST MEDIA PUBLICATION
VOL. 74 // NO. 6

The Experts Put Fairway Rolling to the Test

To better understand the benefits of rolling fairways and to build rollers which are more effective, Smithco has been working with the College of Agriculture at Michigan State University and Stockbridge School of Agriculture at the University of Massachusetts . There are still more tests to run and the results to date are preliminary. But very encouraging. To find out more call your Smithco dealer and set up a demonstration. We think rolling fairways could become as normal as rolling greens.

SPECIAL FINANCING ON ALL SMITHCO PRODUCTS
Visit our website at Smithco.com or talk to your local Smithco Dealer.
Discover special financing opportunities tailored to your needs.

“What is most exciting is the data indicates longer ball roll will result from fairway rolling which will make golfers happy...

and that rolling fairways can lead to less fairway mowing which costs more than rolling.”

–Thomas A. Nikolai, Ph.D., College of Agriculture Michigan State University

Although the study is preliminary and far from complete, there are significant indications that:

- Mowing height may be increased, resulting in healthier grass plants
- Soil firmness is likely to be increased resulting in longer ball roll
- Moisture retention is maintained
- Less mowing is required which would result in labor savings and less wear on expensive equipment

“Third year of testing indicates up to 65% reduction in dollar spot.”

– Geunhwa Jung and Jay Popko; Stockbridge School of Agriculture

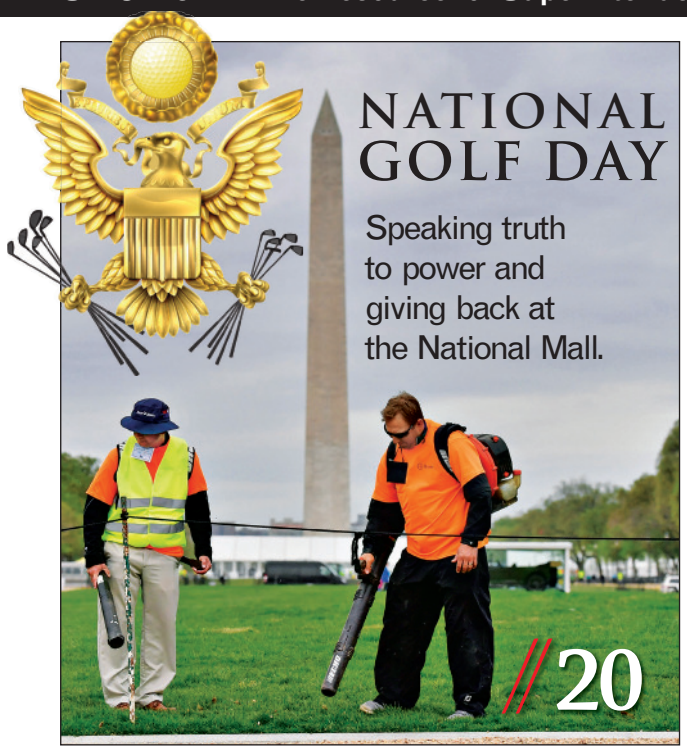
- 40-65% reduction in dollar spot
- 8 out of 9 rolling studies reduced dollar spot in 2017!
- Increased rolling frequency increased dollar spot control
- Threshold-based programs can reduce dollar spot apps with rolling (2-3 apps vs 5 apps)
- Rolling = better spring green-up/turf quality
- Does not provide complete control, but can extend fungicide-control intervals at golf courses with difficult-to-control dollar spot

Smithco.com

Golfdom//06.18

VOL. 74 // NO. 6

SINCE 1927—The Resource for Superintendents // Golfdom.com



NATIONAL GOLF DAY

Speaking truth to power and giving back at the National Mall.

// 20

Under Pressure

The crew at East Lake Golf Club adopts an unorthodox approach to combat algae on the course's greens.

// 26

COLUMNS

DEPARTMENTS

SUPER SCIENCE

// 48

FOCUS ON FUNGICIDES

COVER PHOTO BY: KEVIN DIETSCH

AERATE THAT POND!

...with PondHawk®

The solar-powered aeration system

Nearly all ponds need management to help keep the habitat, water quality and clarity in a healthy balance. Far too often though, ponds are neglected or treated with chemicals and dyes, which can easily damage the delicate pond ecosystem.

PondHawk is the patented solar-powered aeration system that works without batteries. It is designed for use 365 days a year and requires minimal maintenance.

And because PondHawk is not connected to the electric grid, its operating costs are very low. The innovative design installs quickly, doesn't require a special license and can be situated away from the pond and easily secluded if necessary.

PondHawk is quiet, doesn't require a lot of space and needs no batteries, making it the most ecologically-friendly solution on the market.

Find out about the new PondHawk Lease Program – call 888-755-1950 or visit www.LINNEindustries.com

PondHawk® by LINNE INDUSTRIES

Newark, DE 19714 · Phone: 302.454.1439

Golfdom

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

EDITORIAL

EDITOR-IN-CHIEF & ASSOCIATE PUBLISHER Seth Jones
785-690-7047 / sjones@northcoastmedia.net

MANAGING EDITOR Abby Hart
216-706-3756 / ahart@northcoastmedia.net

EDITOR-AT-LARGE Ed Hiscock
ehiscock@northcoastmedia.net

DIGITAL EDITOR Kelly Limpert
216-363-7933 / klimpert@northcoastmedia.net

ART DIRECTOR Pete Seltzer
216-706-3737 / pseltzer@northcoastmedia.net

ASBPE American Society of Business Publication Editors 2016 National PRINT Award Winner Revenue of $5 million or under

ASBPE American Society of Business Publication Editors 2016 National DESIGN Award Winner Revenue of $5 million or under

CONTRIBUTING EDITORS
Karl Danneberger (*Science*), Joe Gulotti, Matt Neff, Jared Nemitz, Clark Throssell (*Research*), Sean Tully, John Walsh, Mark Woodward, Steven Wright

BUSINESS

CLEVELAND HEADQUARTERS
1360 EAST 9TH ST, SUITE 1070, CLEVELAND, OH 44114

GROUP PUBLISHER Bill Roddy
216-706-3758 / broddy@northcoastmedia.net

PUBLISHER Craig MacGregor
216-706-3787 / cmacgregor@northcoastmedia.net

WESTERN REGIONAL SALES MANAGER Jake Goodman
216-363-7923 / jgoodman@northcoastmedia.net

EASTERN REGIONAL SALES MANAGER Dan Hannan
216-363-7937 / dhannan@northcoastmedia.net

ACCOUNT MANAGER Chloe Scoular
216-363-7929 / cscoular@northcoastmedia.net

EXECUTIVE SALES ASSISTANT Petra Turko
216-706-3768 / pturko@northcoastmedia.net

SR. MARKETING & EVENT MANAGER Michelle Mitchell
216-363-7922 / mmitchell@northcoastmedia.net

MARKETING & EVENT MANAGER Angela Gibian
216-363-7936 / agibian@northcoastmedia.net

SR. MGR., PRODUCTION SERVICES Rhonda Sande
216-978-9778 / rsande@northcoastmedia.net

DIR. OF AUDIENCE ENGAGEMENT Bethany Chambers
216-706-3771 / bchambers@northcoastmedia.net

SR. AUDIENCE DEVELOPMENT MANAGER
Antoinette Sanchez-Perkins
216-706-3750 / asanchez-perkins@northcoastmedia.net

MARKETING/MAGAZINE SERVICES

REPRINTS & PERMISSIONS Brett Petillo
877-652-5295 / bpetillo@wrightsmedia.com

SUBSCRIBER, CUSTOMER SERVICE
847-513-6030 / golfdom@omeda.com

LIST RENTAL Brahm Schenkman
800-529-9020 / bschenkman@inforefinery.com

CORPORATE

PRESIDENT & CEO Kevin Stoltman

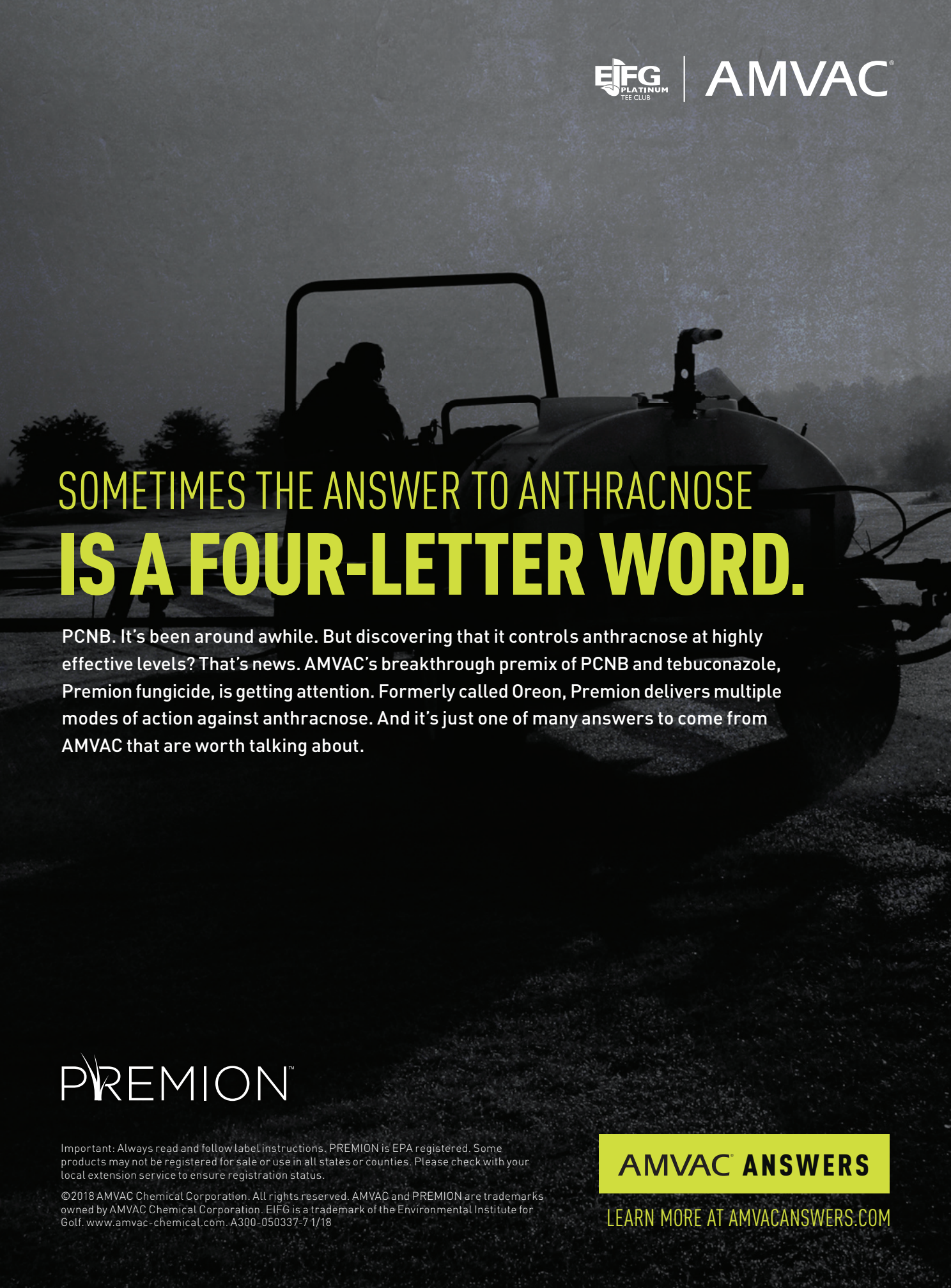
VP OF FINANCE & OPERATIONS Steve Galperin

VP OF GRAPHIC DESIGN & PRODUCTION Pete Seltzer

EDITORIAL DIRECTORS Marty Whitford, Marisa Palmieri

GOLFDOM (ISSN 1526-4270) is published monthly by North Coast Media LLC, IMG Center, 1360 East 9th Street, 10th Floor, Cleveland, OH 44114. **Subscription rates:** For US, Canada and Mexico, 1 year $58.95 print and digital; two years $88.95 print and digital. All other countries, 1 year print and digital $109.95, 2 years $169.95. For air-expedited service, include an additional $75 per order annually. Single copies (prepaid only) $10 plus postage and handling. For current single copy or back issues, call 847-513-6030. **Periodicals postage paid at** Cleveland OH 44101-9603 and additional mailing offices.

POSTMASTER: Please send address change to *GOLFDOM*, PO Box 2090, Skokie, IL 60076. Printed in the U.S.A.


EIFG PLATINUM TEE CLUB
AMVAC®
SOMETIMES THE ANSWER TO ANTHRACNOSE
IS A FOUR-LETTER WORD.
PCNB. It's been around awhile. But discovering that it controls anthracnose at highly effective levels? That's news. AMVAC's breakthrough premix of PCNB and tebuconazole, Premion fungicide, is getting attention. Formerly called Oreon, Premion delivers multiple modes of action against anthracnose. And it's just one of many answers to come from AMVAC that are worth talking about.
PREMION™
Important: Always read and follow label instructions. PREMION is EPA registered. Some products may not be registered for sale or use in all states or counties. Please check with your local extension service to ensure registration status.
©2018 AMVAC Chemical Corporation. All rights reserved. AMVAC and PREMION are trademarks owned by AMVAC Chemical Corporation. EIFG is a trademark of the Environmental Institute for Golf. www.amvac-chemical.com. A300-050337-7 1/18
AMVAC® ANSWERS
LEARN MORE AT AMVACANSWERS.COM

"I got so good at it that I was named the 1976 Olympic Gold medalist in weed-wacking," Gaughan says. "The GM noticed this kid who kept coming back to edge bunkers and do various other jobs, and he asked me if I'd like to be superintendent someday."

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

Gaughan decides it's time to be gone

Since 1975, Chris Gaughan, CGCS, has been working at Eugene (Ore.) Country Club, emerging as a legend of Oregon golf along the way.

That 43-year run comes to an end this month, when Gaughan retires and hands the keys to the maintenance shop to Tim Cloninger, previously superintendent at Shadow Creek Golf Club in Las Vegas.

Gaughan (pronounced *Gone*) will retire two weeks shy of a 44-year career at Eugene CC. He wants his streak to end at 43 years in reverence to World War II veteran Wendell Wood, who holds the record for working at ECC — 44 years as the club pro.

"I began weed-wacking all day long in 1975 at the age of 16," he recalls. "I got so good at it that I was named the 1976 Olympic Gold medalist in weed-wacking. The GM noticed this kid who kept coming back to edge bunkers and do various other jobs, and he asked me if I'd like to be superintendent someday. Back then, you could walk on the ponds, they had so much aquatic vegetation..."

The walk-on-water days are long past Eugene CC today, as it is now perennially among *Golf Digest's* Top 100 courses. Eugene CC is in the regular rotation to host the Pacific Coast Amateur Championship and hosted the 2016 NCAA Championship, won by the Oregon Ducks. (The course hosts the USGA Senior Amateur in August, but as Gaughan says, "that's Tim's problem.")

Early in his career, Gaughan spent time on the LPGA Tour, caddying for his sister Cathy Mant, now head women's golf coach at Georgia State in Atlanta. It was this time, visiting a new city each week, that taught him how to socialize and gave him his sense of sarcasm.

"I remember once Betsy King's caddie asked me if I was tired of hanging out with all those clowns," Gaughan says. "We used to mess with the local caddies. We'd set the bags on top of sprinklers so they couldn't find yardage markers. We'd tie up the flags so they couldn't read the wind direction."

When Gaughan was ready to take his turf career to the next level, he sought the advice of John Zoller, who was a superintendent as well as his godfather. Zoller told him to either go work at the best course possible or for the best superintendent he could find. He went with both options and spent a year with John's son Bob Zoller at Monterey Peninsula CC in Pebble Beach, Calif., and a year with Dick Fluter at Oswego Lake CC in Lake Oswego, Ore. Add in a year at Oregon State University's turf program studying under Tom Cook, and Gaughan was set to succeed.

Gaughan credits his success to his ability to socialize, his game (he's a 2-handicap) and being a good listener. He also says he's in one of the top three places on the planet to grow *Poa annua* greens.

"New Zealand, Australia and the Pacific Northwest," Gaughan says. "Getting them smooth, firm and fast is not a challenge."

His favorite thing about the job is also his least favorite thing about the job: people.

"Employees have changed. They used to stay for decades, now they stay for a month," he says. "You take the time to educate them and then they pull out to work for a landscaping company. Dealing with Millennials, everyone thinks they deserve a trophy, while I'm still waiting for that Olympic gold for weed-wacking."

What awaits Gaughan in retirement? He hints that he won't be able to sit still for long. His wife, two daughters and three grandchildren will see him more. But don't be surprised if the lure of the golf course is too much for Gaughan to stay gone.

"I'm Type-A, I'll be bored in two days," Gaughan says. "I like doing the same thing every night. I like walking greens and hitting putts to see how the greens are. I'll miss those times."

Email Jones at: sjones@northcoastmedia.net.

SHIFT YOUR APPROACH.

Cover more ground with the TR Series.

Built to tackle hard-to-reach areas, the TR Series pairs superior slope capabilities and maneuverability with the unique ability to cut every blade of grass before driving over it. The TR330's AdaptiShift™ technology allows operators to effortlessly shift all three cutting reels to either side of the machine, creating up to 18-inches of offset and the option to create varying tire track patterns. The TR Series' versatility enables you to cover more ground while maximizing Jacobsen's legendary quality of cut.

Get more details at www.jacobsen.com
or call 1.888.922.TURF

JACOBSEN®
Every Blade Counts.

TEXTRONGOLF

Starter

NEWS, NOTES AND QUOTES

//GOLF 20/20 REPORT

NGCOA CEO Jay Karen listens as WGF's Steve Mona announces golf's big news.

GOLF'S BEST YEAR EVER?

By Seth Jones // *Editor-in-Chief*

WASHINGTON, D.C. — 1962 was a special year, the year a young Jack Nicklaus defeated Arnold Palmer at Oakmont to win the U.S. Open. And 2000 was a pretty good year, too, when Tiger Woods won the U.S. Open, the Open Championship and the PGA Championship.

But the folks at We Are Golf are declaring 2016 as the best year ever, based on the whopping $84 billion in economic activity the game generated across the United States.

The 2016 U.S. Golf Economy Report recently released by Golf 20/20 and TEConomy Partners reveals 2016 as golf's biggest financial year ever measured. The group conducted the study in 2000, 2005, 2011 and now 2016. The report shows that golf grew by 22 percent since 2011, when the game generated $68 billion. Despite a net decline of 737 golf facilities since 2011, average revenue for 15,104 U.S. golf facilities grew in 2016, generating $33 billion and marking a solid recovery from the major economic downturn of the last decade.

"(This report) is like a check-up of our health," Jay Karen, CEO of the National Golf Course Owners Association, said of the announcement. "It's not just the health of our industry, but also the impact we have on others, the healthy impact we have on communities and the American economy. Revenue is up, and spending is also up, so it's a healthy business."

To view the full report, visit **wearegolf.org/economy/impact**.

//THE CGCS IS NOW A COO

RANDQUIST NAMED GCSAA COO

Robert M. Randquist, CGCS, has been named chief operating officer of the Golf Course Superintendents Association of America (GCSAA).

Randquist comes to GCSAA after 20 years as director of golf course and grounds at Boca Rio Golf Club in Boca Raton, Fla., where in the last year he oversaw the renovation of its Robert von Hagge-designed course. The leadership at Boca Rio always has been highly supportive of Randquist's involvement with GCSAA, as well as his new opportunity.

Prior to Boca Rio, he spent two decades as superintendent at Southern Hills Country Club in Tulsa, Okla., where he hosted the 1982 and 1994 PGA Championships and helped secure the 2001 U.S. Open.

No stranger to GCSAA and its members, Randquist served as the association's president in 2011. He has been a GCSAA member for 41 years and became a certified golf course superintendent in 1985.

//HOMETOWN HERO

BLUME ELECTED ASGCA PREZ

Jeff Blume, ASGCA, was elected president of the American Society of Golf Course Architects (ASGCA) at the organization's recent 72nd Annual Meeting in his hometown of Houston.

Jeff Blume

Blume is a Landscape Architecture graduate of Texas A&M University. He first joined the firm of ASGCA Past President Jeff Brauer, GolfScapes, where he rose to the position of project architect. Blume then moved to the firm of Robert von Hagge, serving as project architect for assignments in the United States, Japan, Mexico and the Caribbean.

After five years with von Hagge, Blume formed his own design firm, Jeffrey D. Blume, Ltd. Blume and his company have, among numerous projects, designed the Grand Pines Golf Club at Bentwater, in Montgomery, Texas, and led renovation projects at several courses, including *Golf Digest* Best New courses recipients The Golf Club at Texas A&M in College Station, Texas, and Boiling Springs Golf Club in Woodward, Okla.

PHOTO BY: KEVIN DIETSCH / ISTOCK.COM (WELLGLAD)

The Plastic Pick-Up retrieved 21,000 golf balls from the area around Pebble Beach Golf Links.

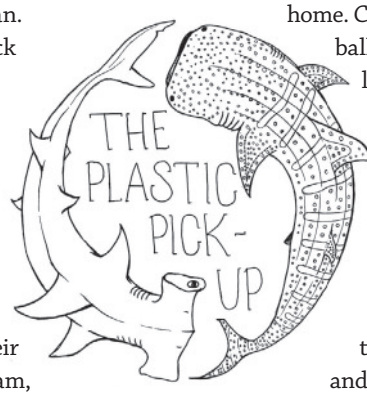
PHOTO COURTESY OF THE GLORIA BARRON PRIZE FOR YOUNG HEROES

//IN THE DRINK

What is that, a Titleist?

Kramer once famously asked George Costanza that line in an episode of "Seinfeld" after smashing golf balls into the ocean. Now two California youths have been awarded the Gloria Barron Prize for Young Heroes for retrieving those Titleists from the ocean.

Alex Weber and Jack Johnston, age 17, of Carmel, Calif., co-founded The Plastic Pick-Up, a non-profit committed to keeping plastics pollution — especially golf balls — out of the ocean. With their Fore the Ocean program, they have removed more than 21,000 golf balls in the past year — equivalent in weight to 147,000 plastic grocery bags — from the sea floor below Pebble Beach Golf Links. They are partnering with The Pebble Beach Co., the Monterey Bay Aquarium and the Monterey Bay National Marine Sanctuary to implement monthly underwater golf ball clean-ups and weekly beach clean-ups.



The two began their work after discovering thousands of golf balls while freediving in Carmel Bay near their home. Concerned about the balls' impact on marine life, they learned that after a ball's outer plastic layer breaks down, its rubber band core unravels into what looks like dried seagrass, which may be mistakenly eaten by birds and sea life. Further, golf balls with a solid core contain zinc acrylate, known to be highly toxic to aquatic organisms.

So, consider that extra inspiration to keep your golf ball dry, over the one-stroke penalty and the loss of $5.

//A TERRIFIC 10

AWARDS SEASON

Congratulations are in order to Kelly Limpert, *Golfdom* digital editor, for being named by the American Society of Business Publication Editors (ASBPE) as one of the top industry editors under the age of 30. We're both proud of Kelly and jealous — Kelly, what's it like to be under 30? We can barely remember...

Also, *Golfdom* took home 10 Turf and Ornamental Communicators Association Awards at the recent annual meeting in Cincinnati. The magazine earned four first-place awards and six merits:

Best single photo, stock art (first)
Turf Rx, Pete Seltzer
Best single photo (first)
Magic kingdom, Seth Jones
Best print magazine cover (first)
Historic hurricanes, Chris Ortmeier and Pete Seltzer
General Feature writing (first)
The Shadow (Creek) superintendent knows, Seth Jones
Business management writing (merit)
The Shadow (Creek) superintendent knows, Seth Jones
Best print magazine cover (merit)
Magic kingdom, Pete Seltzer
Single page design (merit)
Appreciating the forest for the trees, Pete Seltzer
Best single photo (merit)
A golf course waiting to happen, Dave Richards
Special publishing project (merit)
2017 Early order program guide for early birds
Writing for enewsletter (merit)
Golfdom Insider, Seth Jones, Kelly Limpert, Grant Gannon

Golfdom Gallery

1 We saw the president in D.C.! No, not President Donald Trump, but GCSAA President Darren Davis, CGCS, superintendent at Olde Florida GC, Naples, Fla.

2 How's my tie? Doug Myslinski, Wadsworth Golf Construction Co., Plainfield, Ill., straightens his tie in the U.S. Capitol while GCBAA Executive Director Justin Apel (center) and Pat Karnick, Wadsworth Golf (right) look on.

3 Men at work Tony Kalina, Kalina Turf Consulting, Chicago (left), and Mark Jordan, CGCS, Westfield Group CC, Westfield Center, Ohio, were on the sod squad during the beautification project at the National Mall.

4 Your host superintendent *Golfdom* EIC Seth Jones met Ron Freking, superintendent at Devou Park GC, Covington, Ky., before the Turf and Ornamental Communicators Association golf tournament.

5 Which way to the men's room? We saw all these guys at Augusta National... then we ran into (left to right) Scott Ramsay, CGCS, the Course at Yale, New Haven, Conn.; Marc Weston, CGCS, Indian Hill CC, Wethersfield, Conn., and Ryan Swilley, Gulf Stream GC, Delray Beach, Fla., again at National Golf Day.

6 1.4 million reasons to smile Golf social media celebrity Paige Spiranac (she has 1.4 million followers on Instagram and is a *Sports Illustrated* swimsuit model) was cool enough to take a photo with *Golfdom* Publisher Craig MacGregor, who still refuses to expand his social media reach beyond Facebook.

7 Agreeing on Augusta and Austin Since hanging out at Augusta National, Floratine's R.J. "Stretch" Strautman (left) and Jones have come to a decision: The Golf Industry Show should be held in Austin, Texas, if only for the live music scene.

PHOTOS BY: SETH JONES (1-3, 5); CRAIG MACGREGOR (4); KEVIN DIETSCH (6); LANE FERGUSON (7)

SIMPLY THE BEST

QUALI-PRO BRINGS TOGETHER THE BEST IN CHEMISTRY AND CUSTOMER SERVICE

Turf & Ornamental Products

From Control Solutions, Inc.

Make It Simple. Make It QUALI-PRO

Herbicides

Fungicides

Insecticides

PGRs

QUALI-PRO

Innovation you can apply.
Call 800-242-5562
quali-pro.com
@quali_pro @qualipro

In all things, simplicity

Communication, easy-to-understand programs are keys to business success

By **NICHOLAS STRAIN** Business Director for Quali-Pro Products

From my first job at a golf course in 1996 at the age of 16, to my experience working at Blackhawk Country Club in Wisconsin during college, John Deere Landscapes and Barenbrug Seed to where I am today with Quali-Pro, there is one thing that has always been important to me: the customer.

The Quali-Pro brand started in the early 2000s with one post-patent active ingredient, Chlorothalonil, and now has grown to lead the industry with access to more than 120 active ingredients. Our motto, "Simply. Grow. Together," is born out of our experience as a small company that grew into the Control Solutions Inc. family and is backed internationally by Adama and ChemChina.

As the new business director for Quali-Pro, we are going to continue to develop new, innovative, proprietary chemistries like our nematicide, Nimitz, and to work with existing active ingredients in the industry by developing products like Enclave, our fungicide that combines four modes of action from chlorothalonil, iprodione, tebuconazole and thiophanate-methyl all in one easy-to-use jug. We're also working with existing single active ingredients to simply make them better, like one of our newest herbicides, dithiopyr, which comes in water soluble bags and a liquid formulation.

So, let me ask you: What do you need to make your day-to-day interactions with Quali-Pro and our products simple and convenient?

One thing I've seen is the need to expand our outreach. We are doubling our sales force in the field from four area managers that cover the U.S. to eight area managers and one key account manager. This will allow us to support golf course superintendents like you, providing education out in the field and being more actively involved in local associations. We will maintain our focus on making our industry programs and the new products we're developing simple to understand.

Our current Quali-Pro area managers have more than 100 years of combined experience in the industry. We also have an in-house research and development department led by Marie Knox, who has a masters in nematology and turf. Our technical services manager, Gary Custis, with his 40 years of experience, works closely with universities to develop new combinations.

With mergers over the years, the Quali-Pro brand is still based in the U.S., in Pasadena, Texas, and operated by the founder of Control Solutions, Mark Boyd.

Strain was previously Midwest Area Sales Manager. He's based out of McFarland, Wis., where he lives with his wife Lära and their two children, Ellie and Breck. He can be reached at nstrain@controlsolutionsinc.com.

He and Control Solutions Executive Vice President Curtis Clark play a major role in our day-to-day operations and maintain the focus of the company on making all things simple.

Quali-Pro programs are simple. That's echoed throughout the corporate culture here, as you'll hear from Mark and Curtis on the coming pages. Simplicity to us is about understanding your needs and having straightforward programs and products to meet those demands. Let us help you simplify your business with Quali-Pro products.

QUALITY SOLUTIONS

Quali-Pro teams up with superintendents to improve course conditions.

By **CHRIS LEWIS**

Every superintendent, regardless of experience, location or facility, has two main questions every morning: How will I improve my course's condition today? And how will I increase our bottom line?

Answers to these questions can vary considerably. Superintendents are constantly experimenting with cost controls, mowers, grasses and staff sizes. But one common factor for success is certain: Correct fungicides for a course help superintendents provide the best possible playing conditions for guests. And, having guests consistently visiting the course improves the bottom line.

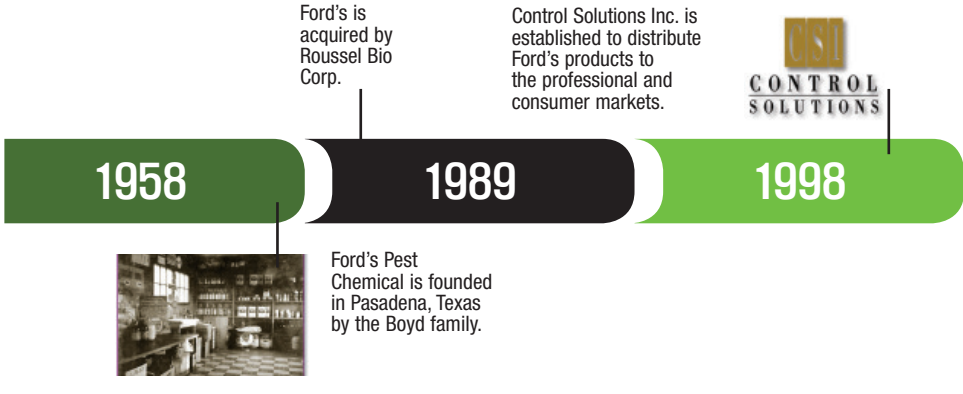
With this in mind, Quali-Pro works with superintendents to provide fungicides that offer quality results for cost-effective rates. One of the ways Quali-Pro is able to offer such a variety of products to golf course managers is by being a division of Control Solutions Inc. (CSI), which is a subsidiary of Adama Solutions, the world's fifth largest agricultural chemical provider.

Mark Boyd, president of CSI, says he anticipates more growth and an increase in product offerings from the company. "CSI has just now started changing the perspective of who we are in the industry," he says. "My vision is that we will launch products in the next 5 years that will change the industry."

Golfdom recently spoke to three course maintenance professionals to see how their courses have benefitted from testing and applying Quali-Pro products.

History of CSI

Control Solutions Inc., the Texas-based manufacturer of the Quali-Pro brand, is a subsidiary of Adama Agricultural Solutions and ChemChina, which also recently acquired Syngenta.



A putting green at Bryan Park Champions Course in Greensboro, North Carolina, treated with Quali-Pro's Nimitz product.

Substantial Savings for Dollar Spot and Snow Mold Treatment

Gary Custis, technical services manager for Quali-Pro, and his team are always working on new products for the industry. "The products we bring to market work. And, the more somebody understands about the products, the better it's going to work."

Tim Peterson

Understanding the right combination of products to use for dollar spot and snow mold is what helped Tim Peterson have success last year. Using a broadcast sprayer, Peterson consistently applied three Quali-Pro products throughout his golf course, Aldeen Golf Club, an 18-hole municipality golf course based in Rockford, Ill.

Quali-Pro's Chlorothalonil 720 SFT, Tebuconazole 3.6F and T-Nex were applied to 4.5 acres of greens, six acres of tees, 24 acres of fairways and the club's 26-acre practice center.

"The products have definitely improved conditions, as they've helped control dollar spot in tees and fairways," he says. "I also came out of winter with absolutely no snow mold damage."

Peterson says he discovered Quali-Pro products by searching for an alternative that had the same quality and results but would be more cost effective. He has now been using the Quali-Pro products on his course for six years.

"Quali-Pro products are the exact same as products that are more expensive. To me, it was a no-brainer to go that route," he says. "My maintenance budget this year is $51,000, so I intend to use the same products that I did in 2017."

Nimitz Pro G Significantly Reduces Nematodes

The in-house product development team at CSI is a staff of six people that Curtis Clark, executive vice

2004

Contol Solutions Inc. is acquired by Makhteshim Agan (which is now known as Adama).

QUALI-PRO

2011

The Quali-Pro brand is integrated into the Control Solutions family.

2017

CHEMCHINA

ChemChina completes purchase of Adama.

Control Solutions Inc. celebrates its 20th anniversary with the establishment of a new aerosol and microencapsulation production facility.

2018

president, says work full time on researching and creating new products. "The fact that we have so many people thinking about new revolutionary products has built a huge pipeline of products we will be developing and introducing in the next decade."

Those new product developments are what helped Wes Crompton solve a nematode problem at Bryan Park Golf and Conference Center's Champions Course.

The course's greens were converted from L-93 bentgrass to MiniVerde Bermudagrass in 2013. Two years later, the 125-acre course, which is one of two 18-hole courses owned by the city of Greensboro, N.C., began to experience symptoms of nematode activity.

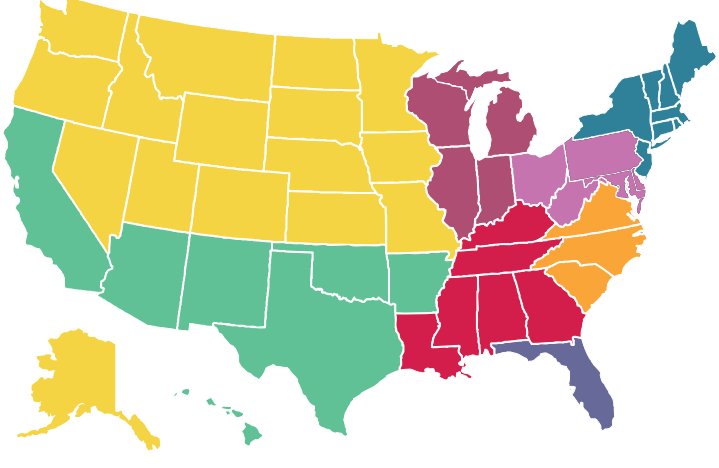
At the time, very few products were available to treat nematodes. Crompton, Bryan Park's director of golf course maintenance, decided to use Quali-Pro's Nimitz Pro and noticed a reduction in the course's nematode population with one 80-pound application in spring of 2016. Increasing to three 80-pound applications for 30-day intervals for a trial in 2017, nematode numbers declined considerably and turf conditions improved, as hot spots were reduced in size and number.

Wes Crompton

"In 2016, there were times we were limited to what we could do culturally, in fear that nematodes would delay recovery," Crompton says. "But last year, we didn't have any issues with recovery from aerifications and vertical mowing."

Crompton and his team, which have a $132,000 yearly chemical/fertility budget, will continue applying Nimitz Pro G on the course's greens again this season.

"Like last year, we began our applications in mid-spring and will finish them in mid-summer," he says. "New research is suggesting fall applications may be better, though. So we may apply Nimitz Pro G in the fall next year, as we prepare to further reduce our nematode population and provide our guests the best golfing experience possible."



Mike Daugherty – Northwest (618) 513-5001
michael.daugherty@controlsolutionsinc.com

Todd Deitz – Mid-West
Please contact Business Director for more information.

Jeremy Moore – Southeast/Key Accounts Manager
(919) 279-0510 jtmoore@controlsolutionsinc.com

Jake Wylie – Mid-South (940) 249-6239
jwylie@controlsolutionsinc.com

Paul Blodorn – Northeast (802) 236-8863
paul.blodorn@controlsolutionsinc.com

Paul Fox – Florida (727) 423-9280
paul.fox@controlsolutionsinc.com

John Haguewood – Gulf Coast
Please contact Business Director for more information.

Shannon Slevin – Mid-Atlantic
Please contact Business Director for more information.

For the most up-to-date contact info, visit https://bit.ly/2HWfBMx

For sales in the Mid-Atlantic states, please contact Business Director for more information.

Gary Custis – Technical Svc. Mgr.
(816) 679-1563 gcustis@controlsolutionsinc.com

Nicholas Strain – Business Director
(608) 301-6407 nstrain@controlsolutionsinc.com

Q&A

With former superintendent Paul Blodorn, now of Quali-Pro

Paul Blodorn is now Quali-Pro's Northeast Area Manager. Blodorn is one of two members of the Quali-Pro sales team who previously worked as a superintendent.

What got you started in the golf industry?
I've been interested in golf since I was a kid. In high school, I wanted to get a job and play some golf so I started working in the pro shop at South Hampton Golf Club. I did that for a couple years, and then I met the superintendent at Atlantic Golf Club. He offered me a job and took me under his wing. I worked for him for the next 4-5 years throughout college and in the summers. I liked being outside, working around golf and being able to play as much as I could.

How does your experience as a superintendent inform the work you do today with your customers?
It's important to have the hands-on experience and know what superintendents are thinking, how they approach their problems and what they expect when they use products. Just to know their mentality and know the decision-making process that they are going through is helpful. Superintendents need to be comfortable with the products — and I understand that. I understand what the risks are if they misapply or don't use a product properly.

Burnout is a serious issue. Did you experience that in your time as a superintendent? What management strategies did you use?
You don't realize how much of a toll the work takes on your body mentally and physically. Looking back now, being almost 4 years removed from that end of the business, there were certainly times I was burned out by mid-season.

As far as dealing with it, you try to take time and get away when you feel like you're at the end of the rope. It wasn't always easy. You get into July/August and your time is pretty tight. You're always thinking about the golf course at that time of year, no matter where you go or what you do to get away.

Burnout is definitely something I sense when I talk to superintendents now. Mid-summer, they seem burned out and lot of them just like to vent and talk about their season and the good and bad of it. They just want to have somebody to listen to them at that time of year when they're feeling the stress. I think that is more important than diving into the nitty gritty of products. It's important to talk to them about whatever is on their mind.

What are the main issues affecting superintendents today?
The job market in general is fairly tight. Upward movement might not be as rapid as when I was in the business in the early 2000s, when they were building golf courses at a pretty high rate. It's also challenging trying to educate people who don't know golf, or about what superintendents do for a living and on a daily basis. Superintendents have a broad set of skills.

How do you think Quali-Pro can make superintendents' lives easier?
The nice thing with Quali-Pro is we have such a diverse portfolio of products. We cover all the bases of a superintendent's potential problems. If they're looking for a solution to a certain issue, chances are, we have it. It's all in one place.

How do you overcome common misconceptions about Quali-Pro?
I try to educate on the size of our company, what we do and how we do it. Walking the superintendent through a presentation with our production facilities helps show them what our capabilities are. One of our big focuses as a company is the ability to create a wide variety and range of products. We have access to more actives than any other manufacturer.

If there's one Quali-Pro product that your customers aren't currently using but should be, what is it?
Enclave. It is a unique fungicide product we offer. It's been known as a great snow mold product but we're trying to get more in-season use. It has a list of great benefits as far as resistance, range of diseases controlled and being an economical value to superintendents. It is a four-way combination product that offers four different chemistries/modes of action. It's a safer product as far as a surfactant package, compared to if they were to mix those four actives by themselves.

Where is Quali-Pro going in the future?
As we progress forward, we're trying to focus on some unique combination products that aren't in the marketplace at the moment, as well as some of our own proprietary products. It's exciting to see what opportunities we may have in the next year to three years as far as differentiating products that we hope to release. That's an exciting outlook for us as a company — and our customers.

THE NEXT GENERATION BASIC.

Adding value and versatility with the broadest portfolio of actives in the industry

Innovative Products

Unique Formulations

Fungicides

Contact & Systemic

Herbicides

Pre- and Post-Emergent

PGRs

Insecticides

Liquids and Granules

Find out more about these and our other solutions at quali-pro.com

Innovation you can apply.
Call 800-242-5562
quali-pro.com
@quali_pro @qualipro

QUALI-PRO

"It seems there have been more instances of turf guy-on-turf guy Twitter violence over the last year or so than I've seen... And there's simply no reason for it."

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

Anti-social media

I am not a huge fan of social media. I have a Twitter account, but aside from a few friends and some miscellaneous sports accounts, my feed is almost entirely turf related. At the risk of sounding like the guy who "only reads *Playboy* for the articles," I'm basically only on Twitter for the turf information.

While there admittedly are some benefits to social media, it also can be argued that it is the single greatest contributor to the staggering level of societal discord and personal unhappiness currently present in this country. It's amazing how disrespectful people can be while hiding behind the cloak of a screen name and an IP address.

Social media is the main catalyst for the ridiculous "outrage culture" we now live in. The only thing that many people love more than being offended is spewing their indignation all over the internet in an orgy of virtue signaling that, in the not too distant past, would've disgusted even the most self-righteous grandstanders.

Lest anyone think this is intended as a partisan statement, it's not. There are people on all sides of any issue that seemingly live to do this.

But turf social media was unfailingly different. Along with being a great resource for information, the thing I've appreciated about turf social media is the civility of the discussions. Even when people in this business disagreed, they tended to do so respectfully and genuinely were interested in hearing the other side's reasoning.

Unfortunately, this doesn't always seem to be the case anymore. Respectful discussions are still the norm, so to paraphrase a great man, I guess we got that going for us... which is nice. But it seems there have been more instances of turf guy-on-turf guy Twitter violence over the last year or so than I've seen since I started my account five years ago. And there's simply no reason for it.

The last person who should be second guessing or flat out criticizing a superintendent or assistant's agronomic and management programs, opinions or ideas in a public forum is a fellow superintendent or assistant. What right does anyone have to do that? If you disagree with what someone else is doing, don't implement it at your course. If you think someone's an idiot, quit reading their posts. There's nothing wrong with respectful questioning, but being overtly critical — or even hostile — does no one any favors.

If someone feels compelled to right the catastrophic wrong that an outside-the-box management practice would unleash on the profession if not for their heroic intervention, they can send an e-mail or a DM and save everyone the annoyance and embarrassment of publicly "correcting" a fellow industry professional.

People in this business use social media to communicate not just with industry peers, but also with their superiors, members/golfers and co-workers. It's not a huge reach to think that a superintendent could end up in tough spot because of a critical response from others in the industry. I wouldn't be surprised if this has already occurred, and that's obviously a less-than-desirable outcome.

It doesn't take a genius to see the allure social media has in a business like golf course maintenance. A well-known superintendent who also has a huge Twitter following once called it "the water cooler of our industry." Because we're isolated on our own courses we don't have the opportunity to talk shop around the proverbial office water cooler. Social media gives us the chance to do so.

The opportunity to network and share information with other turf professionals worldwide is awesome and can only benefit the industry and the game of golf. I hope we'll avoid the Thunderdome mentality that seems to be all too common on social media so that the exchange of information and ideas will continue uninhibited.

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

NATIONAL GOLF DAY

Golf's day on the Hill

Background check passed, voice recorder packed, our editor-in-chief made the trip to Washington, D.C. to attend his first National Golf Day. This is what he saw.

BY SETH JONES

"The importance of you all collectively making your voices heard in the halls of Washington cannot be overstated."

CONGRESSMAN MARK SANFORD (R), SOUTH CAROLINA

My *Golfdom* press pass just took me somewhere I never imagined I'd go: as a journalist working in D.C., going as far as the National Press Building, the Rayburn House Office Building and a reception at the U.S. Capitol.

It's hard for me to believe it was so easy to attend National Golf Day with such an impressive group of industry people. Being among the group going to Washington, D.C. gave me a Wayne's World "I'm not worthy!" feeling. But all I had to do was pass a background check (hope you're not surprised I passed) attend a one-hour webinar (I nervously paid attention) and book a flight and room (finding a hotel room was the only hard part) and I was in.

Reporting on Washington, D.C. never interested me. Being in the press room at the White House shouting, "Mr. President!" while waving my hands furiously? No thanks.

But now that I've had a taste of working in Washington, D.C., I'm most definitely going back.

I joined some 275 golf industry professionals for two days of politicking at the recent National Golf Day, organized by the folks at the We Are Golf coalition (**wearegolf.org**). While I spent most of my time holding a pen, a voice recorder and a camera, most of the group went to various meetings, talking to government officials, and also took the time to help beautify the National Mall.

I hope this report on the meetings inspires some of you to join us there in D.C. for National Golf Day 2019, because now that I've attended one, I will be back.

A day that's really two

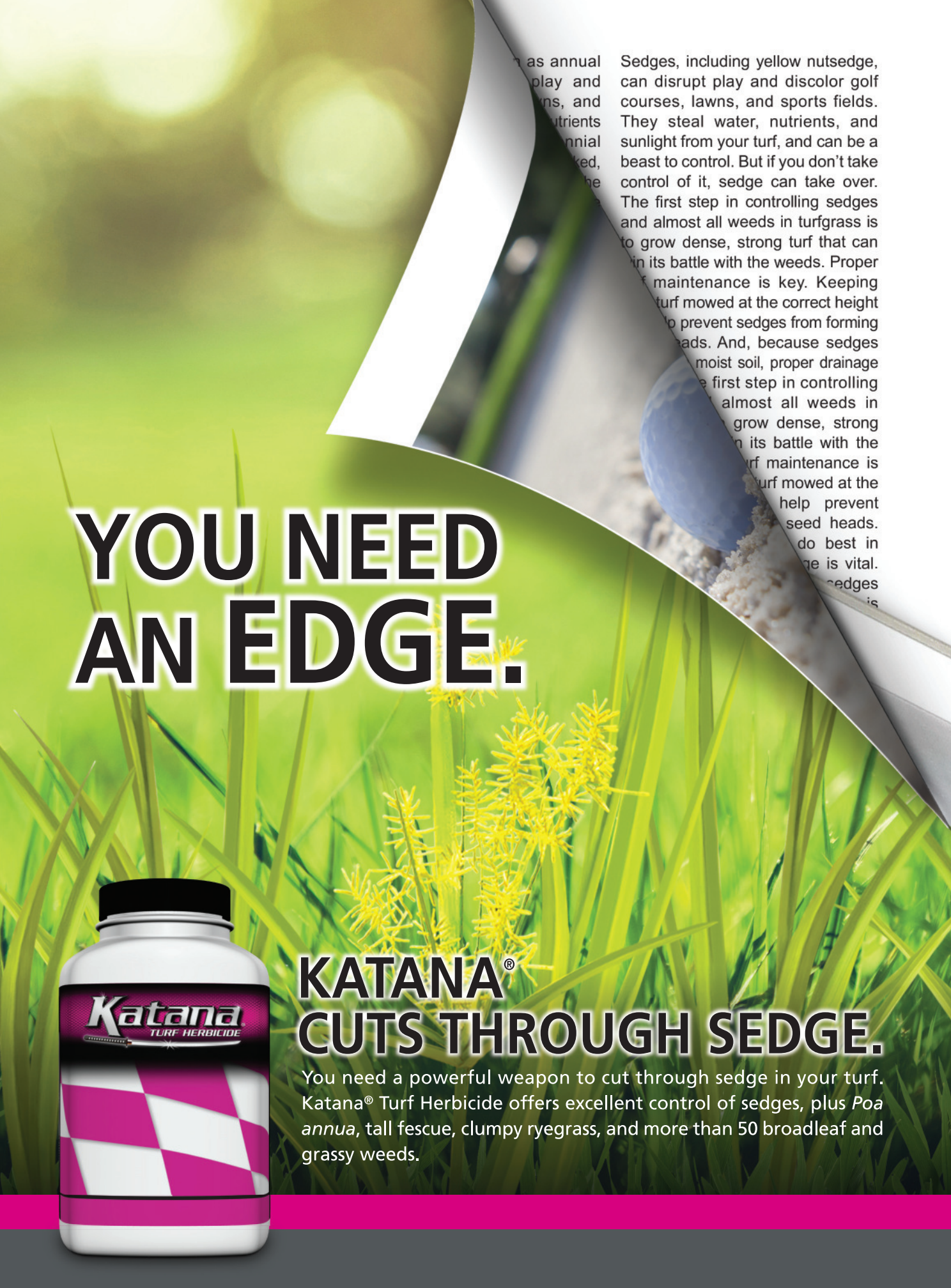
"Thank you for doing what you do. There are a lot of people on the Hill who are avid golfers but also understand the value of golf to the economy and society. You have a lot of allies here."

CONGRESSMAN JOHN YARMUTH (R), KENTUCKY

National Golf Day really was two days, and it kicked off with a project in which the many superintendent attendees could put their talents to work: beautifying the National Mall.

The National Mall needed the help. Surprisingly for such a famous piece of land, it looked a little ragged.

Continued on page 23


as annual
play and
ns, and
trients
nnial
ked,
he
Sedges, including yellow nutsedge, can disrupt play and discolor golf courses, lawns, and sports fields. They steal water, nutrients, and sunlight from your turf, and can be a beast to control. But if you don't take control of it, sedge can take over. The first step in controlling sedges and almost all weeds in turfgrass is to grow dense, strong turf that can in its battle with the weeds. Proper maintenance is key. Keeping turf mowed at the correct height to prevent sedges from forming ads. And, because sedges moist soil, proper drainage first step in controlling almost all weeds in grow dense, strong its battle with the rf maintenance is urf mowed at the help prevent seed heads. do best in e is vital. edges is
YOU NEED AN EDGE.
Katana
TURF HERBICIDE
KATANA®
CUTS THROUGH SEDGE.
You need a powerful weapon to cut through sedge in your turf. Katana® Turf Herbicide offers excellent control of sedges, plus *Poa annua*, tall fescue, clumpy ryegrass, and more than 50 broadleaf and grassy weeds.

NATIONAL GOLF DAY

Continued from page 21

The group got to work armed with mowers, rakes, fertilizers, blowers and sod. People I'm used to seeing in suits — GCSAA CEO Rhett Evans, Yamaha Golf-Car President Tom McDonald, Bayer CropScience's Frank Wong — were in work clothes showing the mall some love. It was only the second time for this charitable project, and it was cool seeing Darren Davis, CGCS, current president of GCSAA, mowing grass with the nation's capitol as one backdrop, the Washington Monument as the other (that's Davis on the far right on this month's cover).

World Golf Foundation CEO Steve Mona thanks the volunteers at the National Mall.

ALL PHOTOS BY: KEVIN DIETSCH

The volunteer effort lasted all morning, but I could stay for only a short time because I had been invited to the National Press Club for a press conference (if I had a dollar for every time I've said that, I'd have exactly one dollar). Steve Mona, CEO of the World Golf Foundation, and Jay Karen, CEO of the National Golf Course Owners Association, had a special announcement to share with the world in honor of the 11th annual National Golf Day.

Turns out 2016 was golf's best year ever (see Starter, page 8). According to the new U.S. Golf Economy Report, golf generated $84 billion (yes, billion with a B) in 2016. This figure comes from anything golf touches — real estate, sticks and balls, greens fees — and is an increase of 22 percent from the figures in the 2011

Continued on page 24

NATIONAL GOLF DAY

Continued from page 23

report, in which the figure was $68 billion.

"In the 16 years we've been measuring the economic impact of golf, no year was more profitable in terms of what golf did for the U.S. economy," Mona stated to a handful of reporters. (To view a PDF of the complete 30-page report, visit **wearegolf.org**.)

Spreading golf's message

"Supporting superintendents for advocacy efforts is critical. In the realm of advocacy and bringing issues and solutions up for the golf industry, GCSAA leads the charge on this."

FRANK WONG, BAYER CROPSCIENCE

Day two of National Golf Day kicked off at the Rayburn House Office Building in the heart of Washington, D.C. The group slowly filed in through metal detectors, then prepared for the most vital part of the event — breaking off into groups by state and meeting with each state's elected officials.

To me this was the most intimidating moment of the event. Attendees were prepared via a mandatory webinar, but speaking about Waters of the U.S. or immigration to an elected politician? Seems daunting.

Erin Stevens, CGCS, MG, Emerald Dunes Club, Palm Beach Gardens, Fla., considers himself a fan of politics and likes to stay up on the issues. But he admitted that his first time walking into a congressional office made him sweat a little.

"I wouldn't call it intimidation, but you're nervous going in there," Stevens told me. "You get grouped up with a team of guys and you all know what the issues are, everybody hits their points, everyone has their sweet spot. You pick your topic, you present

No suit necessary this day — GCSAA CEO Rhett Evans operates equipment during the National Mall volunteer project.

it, and it goes a whole lot better than you'd think. You walk out of there and you're like, 'Great, we got our message across.'"

Scott Ramsay, CGCS at the Course at Yale, New Haven, Conn., was attending his fourth National Golf Day. He and his group were there to meet with every congressional official from Connecticut. Pesticide restrictions were top of mind for Ramsay, but he said no single issue was as important as the idea of presenting himself and his group as experts on what happens on a golf course.

"We pretty much just ask to be left alone," Ramsay told me. "Our goal is to come in and say, we're the experts, we're your constituents and we simply want to explain the impact of the business in Connecticut and around the country."

A way to give back

"I feel like it's important for me to give back to the industry. The industry has been very good to me for many years, and I feel like for us to continue to promote our business and what we do, it's important for us to be here."

ALFRED STEPPICH, SUPERINTENDENT, ROCK MANOR GC, WILMINGTON, DEL.

It was not easy for Alfred Steppich, superintendent at Rock Manor GC, Wilmington, Del., to attend National Golf Day. He recently injured his knee in a fall and had to undergo surgery, but here he was in a walking cast, the sole representative of the state of Delaware.

"It's a tough time (getting around)," Steppich told me, "But this year it's just me, so I'm glad I sucked it up and got here. Last year was my first year, it went pretty well. We presented our case. Who knows what they did with it after we left? But looking at the legislation now, some of the things we proposed last year — the PHIT Act, H-2B reform — all three of our Delaware senators are

on board with that. They're not quite on board with WOTUS yet, and they probably won't be, but we're trying to get them there."

A common theme among attendees at National Golf Day was that it was a way to give back to the industry. Joe Gardner, superintendent at Fresh Meadow CC, Lake Success, N.Y., told me he finds this trip so important that he's been back each of the last three years.

"Coming and seeing all the work being done behind the scenes that we don't get to see every day, it's a special thing that I can be a part of," he said. "And it's something I can take home with me to the guys on Long Island, and hopefully we can mimic what we're doing here back home.

"We talk about the impact we have globally, and we talk about how we're working to make the environment better, not worse," Gardner continued. "To come here and network with people who have handled these issues is important. Golf is important to so many communities. We just need to spread that word."

Something that is worthy of mention is the fact that a majority of the attendees at National Golf Day are superintendents and GCSAA members. While other industry partners were there, they were not nearly as in force as the superintendent attendees.

"It's important for superintendents, that's why you see an overwhelming amount of superintendents here," Ramsay said. "This is a way we can advance our profession within the industry and with our industry partners. (National Golf Day) is one thing we have willingly accepted. We're willing to practice and we're willing to make an effect on the game of golf."

Superintendents overcome uphill battles everyday. It only makes sense that they wouldn't shy away from taking on battles on golf's biggest hill.

"As far as advocacy at the federal level, how much higher can you go?" says Frank Wong, Bayer.

UNDER PRESSURE

The crew at East Lake Golf Club adopts an unorthodox approach to combat algae on the course's greens.

BY KELLY LIMPERT

It's a safe bet that many superintendents would not feel comfortable using a high-pressure hose to clean away build-up on their greens.

But when an uncharacteristic winter blasted the Southeast, the team at Atlanta's East Lake Golf Club turned to pressure washing to rid the greens of algae.

And the unconventional move paid off.

Out-of-control algae

Located roughly five miles outside of Atlanta, East Lake Golf Club is the permanent home of the Tour Championship — the culminating event of the PGA Tour playoffs for the FedEx Cup. (Ralph Kepple, CGCS, is the director of agronomy.)

Unlike the mild winters the Peach State normally experiences, this past winter was consistently cold and extremely wet. December and January brought stretches of bitter cold, and when February and March rolled around, the excitement of warmer temperatures was squashed by an onslaught of rain and overcast skies.

With the horrible growing conditions, algae on the course became a significant problem.

So much so that instead of the usual algae problem areas on a couple of holes, this past year algae grew on at least part of every green.

"We've seen algae problems in the past — on one green in particular — but nothing to the extent we had this previous year," says Charles Aubry, superintendent at East Lake Golf Club.

At the first sight of algae, the club typically would bust out the hoses and spray constantly to push algae off the greens. Which works, of course, but is messy and sloppy from the

Continued on page 28

PHOTOS BY: CHARLES AUBRY

The turf is the real athlete.

Like training a successful athlete, you condition turf to perform and recover quickly. A season-long regimen with Heritage® Action™ fungicide delivers exactly that. Two active ingredients work together to deliver enhanced disease control, and prepare your turf to perform and recover from abiotic stressors like maintenance, traffic and drought – especially in the heat of summer.

For more information on how Heritage Action produces winning turf, go to ConditionPerformRecover.com

Condition. Perform. Recover.

Heritage® Action™ Fungicide

syngenta®

@SyngentaTurf #Time4HeritageAction

MW 1LGG8009-Turf-AGP1 05/18

Continued from page 26

amount of water used to remove the troublesome growth.

However, this year they found there is a more efficient way to remove the layer of algae: pressure washing.

An idea straight from the ballpark

The idea of pressure washing greens was the brainchild of Davis Watts, second assistant at East Lake.

Watts' brother is a high school baseball coach, and whenever Watts goes home to Greenville, Ala., he helps his brother with baseball field maintenance.

After dragging the infield, clay sometimes brushes over the edge of the grass, creating a false lip — not ideal for ground balls, and certainly not great for drainage.

As is common practice in the sports turf industry, the crew would then turn to pressure washers to clean out the buildup, evening out the dirt of the infield and the grass of the outfield.

After seeing the similarities in both situations, Watts shared his experience on the baseball field and suggested it be implemented at East Lake.

"I've never done it on greens or seen it done on greens before, but with the extent of algae we had, it was worth a shot," Watts explains. "It worked so well for baseball fields, it had no choice but to work on greens too."

The nitty gritty

Some superintendents might be thinking, "That's a lot of force on the greens; wouldn't there be damage?"

Damage? No. Exposure of the green itself? Yes.

"What we found with the pressure washing was that you get to use so much less water," says Aubry. "It was able to remove the algae out of the profile and it would just kind of gather up at the end of your spray path; it would kind of sit there. So we would have guys available with shovels to scoop it up as it was accumulating."

Here's how it worked.

The crews started out holding the sprayer about a foot away from the green, but soon discovered this wasn't aggressive enough. To be most effective, the crew moved to within 4 to 6 inches of the surface of the greens, spraying in an area roughly 4 feet by 4 feet.

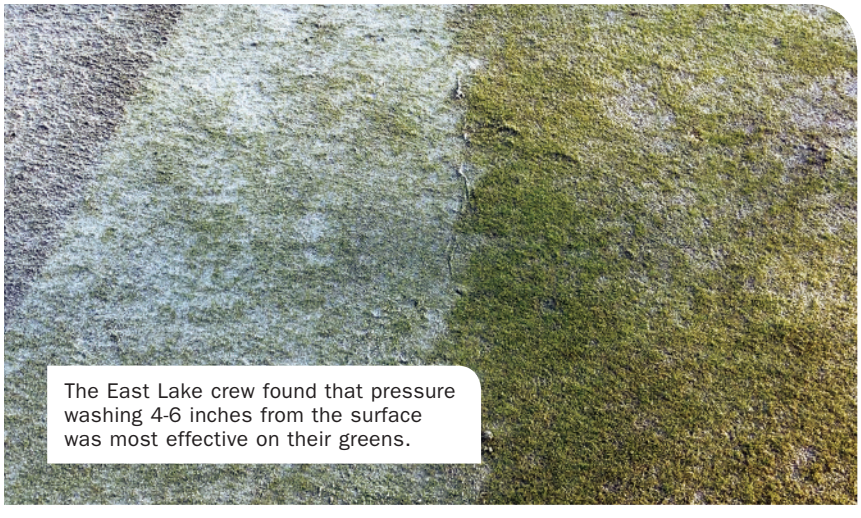
"It worked well," says Watts. "It's interesting how aggressive you can be with it and not tear the green up."

Using a pressure washer at full blast — roughly 2,700 psi — certainly cut down on the slop of previous methods because at the end of the spray path the algae would almost bubble up away from the turf.

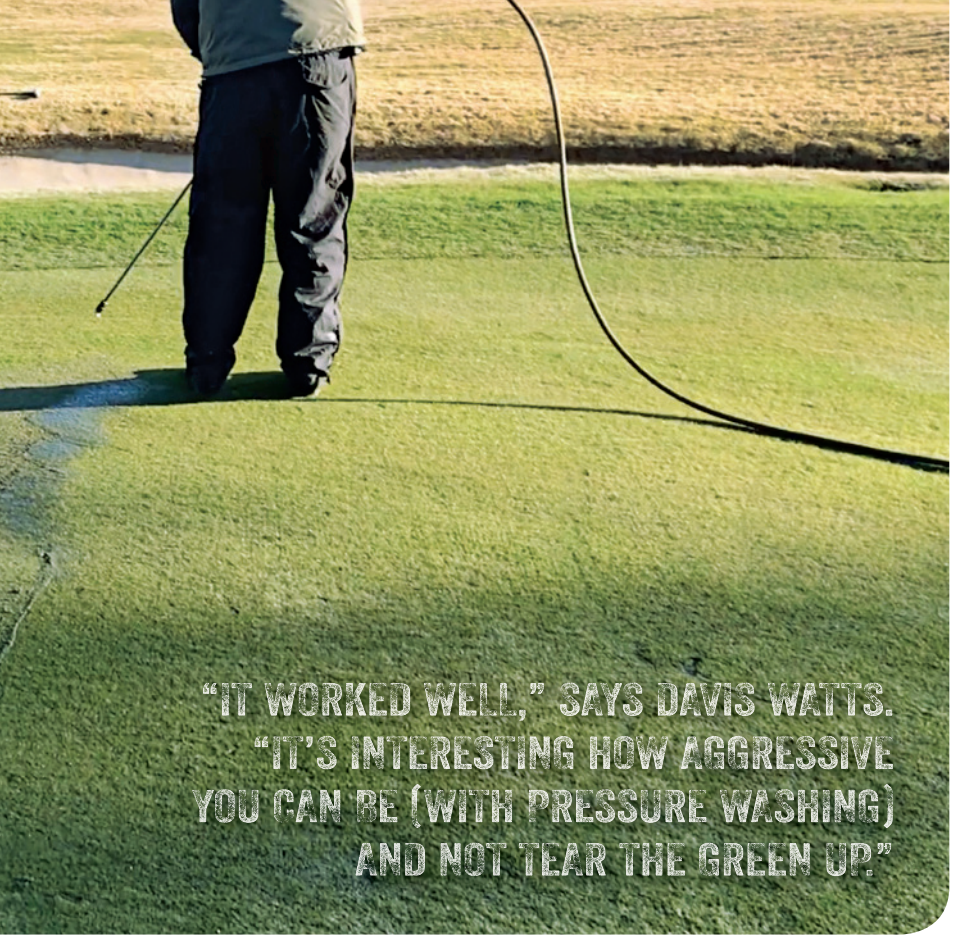
Unlike with hoses, the team could turn off the water after every swipe, saving a decent amount of water and avoiding unnecessary pooling on the greens.

After pushing the residue into consolidated piles with the stream from the pressure washer, crew members used shovels to remove the algae.

"I don't ever wish this on anybody, but if you do get in this situation you can learn



The East Lake crew found that pressure washing 4-6 inches from the surface was most effective on their greens.



a lot about your greens because it exposes stolons," says Watts.

The team had one pressure washer on hand and borrowed one from the neighboring course, Druid Hills Golf Club. Team members also used regular hoses for certain areas during the process.

Clearing the algae away took roughly two weeks, with the crew working normal hours and the course remaining open.

"Davis came up with a great idea to get rid of it," Aubry says. "We tested it out on the back edge of our No. 9 green — the one we were having the most problems with. When we saw the results we were getting, we contacted the president of the club about it, and he obviously approved."

The green is exposed. Now what?

Once pressure washed, the greens were not in a playable condition, says Aubry.

Continued on page 30

Continued from page 29

The healthy stolons and rhizomes that remained created a soft surface and if mowed directly afterward would scalp severely.

To reduce any chance of the remaining stolons becoming a thatch layer, the crew heavily topdressed the pressure-washed areas. This diluted and filled the voids left between the stolons and smoothed the surface of the green.

The East Lake team then used a dried, bagged sand blended with Earthworks 3-3-3 fertilizer at 30 lbs./M, and Renovate Plus at 3 percent of the total product rate.

In addition to making sure the areas had adequate moisture, the crew mostly kept mowers off affected areas, only mowing as needed to smooth out footprints. The crew applied additional fertility at low rates foliarly when soil and air temperatures were conducive for growth.

The brown areas on the greens shown here after pressure washing are healthy stolons, not dirt or sand.

Aubry suggests that superintendents considering pressure washing on their courses move forward with caution because every course is different.

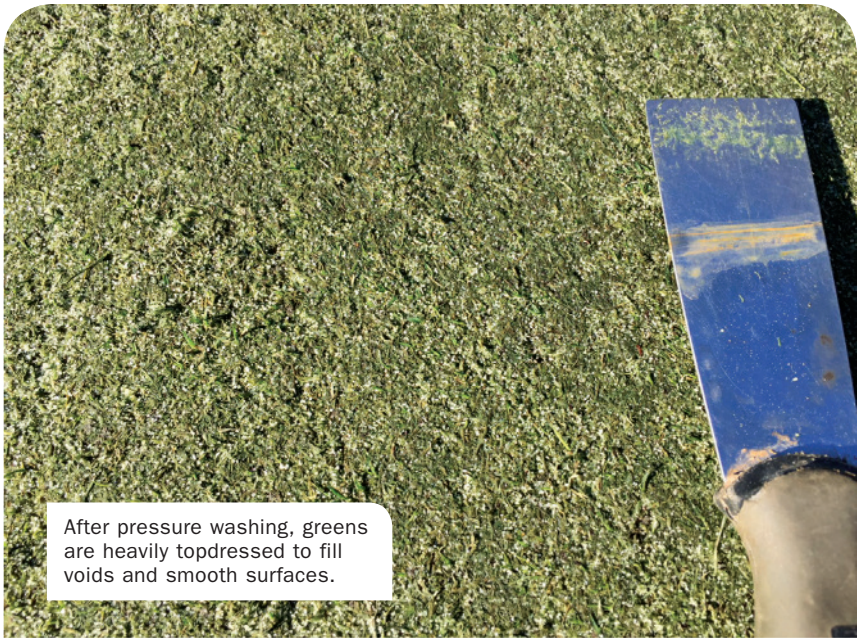
But for East Lake, pressure washing was an efficient way to remove the built-up layer of algae, clippings and old leaves dropped from senescence, exposing healthy stolons and rhizomes to sunlight and air.

"I'm about 100-percent positive that we're in a lot better situation right now than we would have been if we did nothing," he notes.

Despite the continued cold weather, the team has topdressed and fertilized the areas, leaving Aubry positive about the overall outcome.

For those who might be inspired by East Lake's creative thinking, Aubry offers a bit of advice.

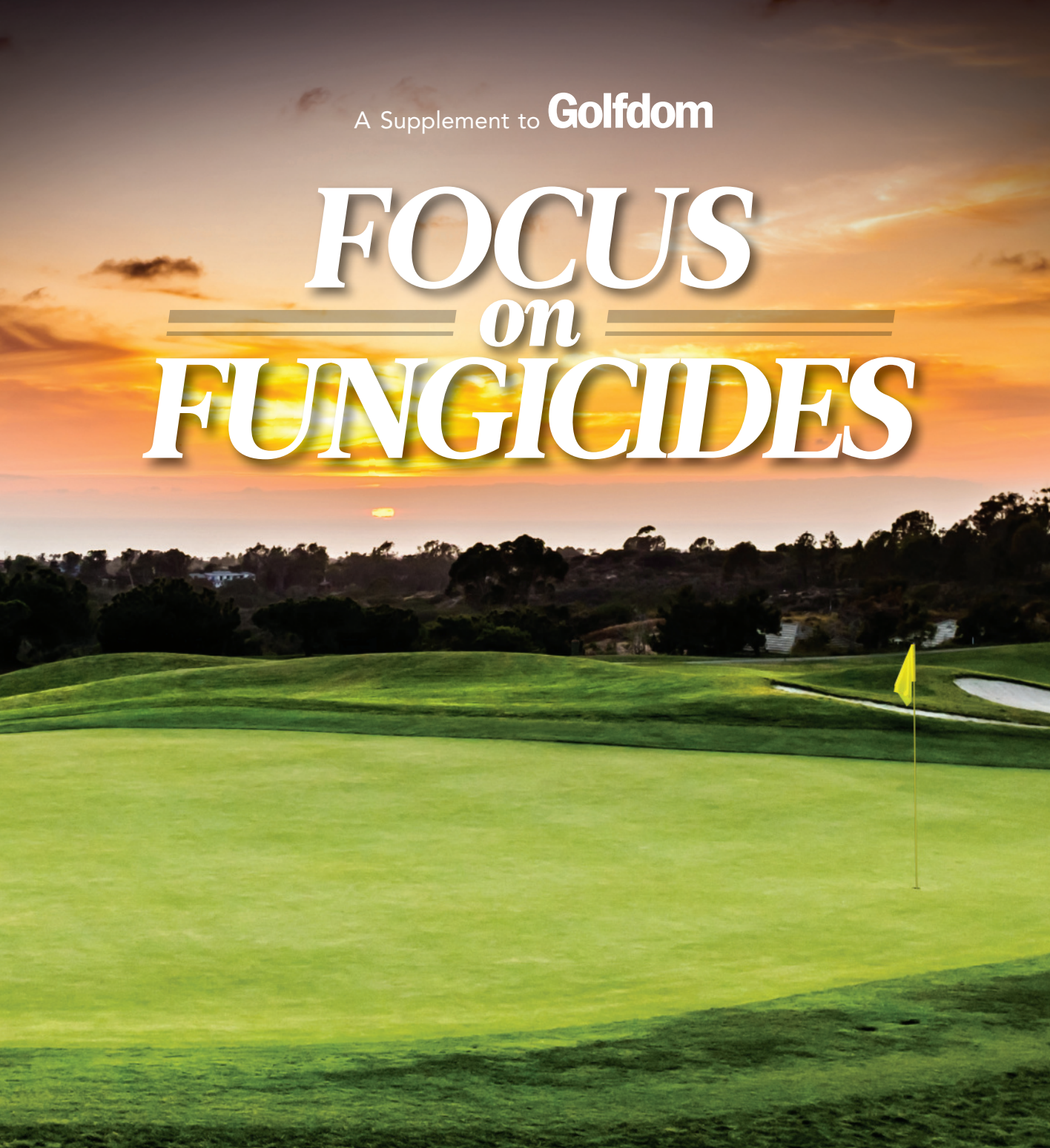
"I won't go full bore on it unless you have some experience with how everything is going to pan out in the end," he says. "Every place is different, obviously, so move forward with caution. But I think it's definitely worth a try to see how your greens recover and take it from there."



After pressure washing, greens are heavily topdressed to fill voids and smooth surfaces.

A Supplement to Golfdom

FOCUS on FUNGICIDES



INSIDE

A **NORTH COAST MEDIA** PUBLICATION

FOR YOU IT'S A MATTER OF PRIDE.

PBI-Gordon helps protect your course and your reputation.

A golfer might brag about a good day on your course, but make no mistake: that's your turf, your mission, and your business card. And PBI-Gordon is dedicated to helping you keep it looking great. For almost 50 years, PBI-Gordon has offered innovative, effective turf solutions for the golf industry, from original Trimec® Turf Herbicide to new Kabuto® Fungicide SC.

▶ For more information, visit GordonsProfessional.com or contact Ray Funkhouser at 804.334.6372.

PBIGordonTurf.com

pbi/gordon corporation
Employee-Owned

A Word from Our Sponsor

THE CHESS GAME THAT IS FUNGICIDE ROTATION

BY BRIAN AYNARDI, PH.D.

As a plant pathologist, I am intrigued by the way pathogens incite diseases in plants, and the way we use fungicides to protect plants from said pathogens to keep golf courses looking like pristine masterpieces. This year, spring has decided to make a late appearance throughout most of the country. At the time I write this article — late April — many are yet to make their first fungicide application, but by the time readers sit down to give it a glance, disease season will be in full swing. Before you jump back on the sprayer with a fresh tank to make your next fungicide application, perhaps we should revisit a common yet critical topic: proper fungicide rotation.

Proper fungicide rotation is just another way of saying fungicide resistance management. Resistance management is imperative for all superintendents, and it's not just those in the academic community that will make that claim — it's those of us in the industry as well. Let's face it, there's not the pipeline of novel modes of action flowing into the market that there was at one time. Furthermore, resistance has developed among nearly all widely used broad-spectrum, site-specific fungicide groups. Examples are aplenty, including *Sclerotinia homoeocarpa* (the pathogen causing dollar spot) resistance to the DMIs, dicarboximides, benzimidazoles, and now SDHIs; *Colletotrichum cereale* (pathogen causing anthracnose) resistance to the DMIs, QoIs, and benzimidazoles; *Magnaporthe oryzae* (the pathogen causing gray leaf spot) resistance to QoIs; and *Pythium aphanidermatum* (the pathogen causing Pythium blight) resistance to phenylamides and QoIs.

So what is proper fungicide rotation and how can you be a steward to the industry by engaging in this practice? Simple: Think of it as a chess game between you and the various fungi that cause turfgrass diseases. Those fungi develop resistance through the continual, repeated use of the same site-specific modes of action. I'm sure you've heard the analogy to using antibiotics or hand-sanitizer too often. The same principles apply with fungicides. Your goal is to keep the fungus guessing by targeting it at different spots in its metabolic pathway each

Brian Aynardi

Continued on page FS4

COVER PHOTO: ISTOCK.COM (MICHAELSVOBODA)

Continued from page FS3

time you defend against it.

For example, let's say you're spraying to protect against the pathogen that causes dollar spot, *Sclerotinia homoeocarpa* (now *Clarireedia sp.*). If your first application is a DMI (FRAC Group 3), you should consider rotating on the next application to another FRAC group such as an SDHI (FRAC Group 7), and on the third application, you should probably rotate to a dicarboxamide (FRAC Group 2) or some other FRAC group. This is a good illustration of proper fungicide rotation.

However, while it is good in practice, it does not guarantee resistance will never develop. It is simply a way of delaying the onset of resistance. We can't always rotate away to another group every single time. So, if using the previous example, you must use a DMI (FRAC Group 3) for a second consecutive application, that's OK, but be sure to rotate to a different FRAC group following two consecutive applications. Also, when making applications using premix products, be mindful to not break the two-consecutive application rule from any FRAC group. I'm not simply making these ideas up, they are recommendations listed on fungicide labels and outlined by the Fungicide Resistance Action Committee (or FRAC) which has developed resistance guidelines and provides very useful information on fungicide resistance at their website **frac.info**.

One of the biggest issues our industry faces is when a new class of chemistry does get introduced to the market and it provides great control of a pathogen. Why? Because we tend to overuse the product and don't properly rotate it into our currently existing program. Take for example the active ingredient cyazofamid, representing FRAC group 21, which came to the market in 2007. It is a QiI fungicide, or quinone inside inhibitor. It works much like the quinone outside inhibitors, or strobilurins, except that it is highly effective against oomycete pathogens, or in the turf world, Pythium diseases. The product is marketed by PBI-Gordon as Segway® Fungicide SC. Segway provides outstanding control of Pythium foliar blight, Pythium root rot and Pythium root dysfunction. It works so well, the first question I ask end-users isn't, "How do you like the results?" but rather, "Are you properly rotating it with other fungicides?" My biggest fear as an employee and a member of the R&D team at PBI-Gordon is to get a call concerning possible resistance of Segway. (Don't worry, there haven't been any yet!)

Let's face it, the days of "use it 'til ya lose it" are over. We all need to be stewards of our industry, and not just for fungicides, but for insecticides and herbicides as well. The financial costs to bring new products to the marketplace are astronomical, and the pipeline for new chemistries currently is not there. Let's all do our part and protect the valuable chemistries we utilize to keep our courses looking pristine. It's not that big of a challenge. Keep an eye out for the FRAC code(s) listed at the top of the label, and try not to apply an active ingredient from the same group on more than two consecutive applications.

Remember, it starts with you, and it's all about rotation.

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

Introducing *Tekken*™ *Broad Spectrum Fungicide*

KNOCK 'EM ALL OUT

With One Punch *And* One Rate.

New **Tekken™ Broad Spectrum Fungicide** from PBI-Gordon uses two modes of action to deliver dependable control of 21 diseases, including anthracnose, dollar spot, and brown patch. The patent-pending formulation increases turf quality while reducing the risk of turf damage compared to stand-alone DMI applications, and Tekken controls listed diseases for up to 28 days with the same rate, eliminating the guesswork.

28 Days | 21 Diseases | 1 Rate

Check to see if this product is registered for sale in your state.

PBIGordonTurf.com

pbi/gordon corporation
Employee-Owned

THE FUTURE OF RESISTANCE MANAGEMENT

The implications of fungicide resistance are clear. Now is the time to respond by using effective resistance management practices.

BY CHRIS LEWIS

Resistance management, arguably, has never been a more important issue for superintendents in every region of the United States. After all, fewer and fewer new fungicide chemistries are now being produced for the turfgrass market, and this trend is expected to continue for years.

Because there simply aren't many rotational partners to choose from, existing chemistries are facing higher resistance pressure. As a result, there also are potential restrictions on current resistance management products, leaving superintendents with no choice but to focus on developing new resistance management strategies for the future.

To help superintendents prepare for the coming age of resistance management, Paul Koch, Ph.D., assistant professor in the plant pathology department at the University of Wisconsin-Madison, presented a GCSAA webinar (available at **http://www.gcsaa.tv/webinars/sponsored/view.php?id=353**.) The webinar focused on the future of resistance management and discussed some surprising aspects of such management, as well as tactics superintendents should consider implementing for long-term success. Here's a rundown on the webinar's focus.

Paul Koch

Overcoming misconceptions and impending obstacles

Despite persisting in the environment for similar amounts of time, fungicides tend to provide different lengths of disease control. Superintendents need to understand why this occurs. If they don't, they won't know the impact of fungicide resistance on disease control.

"For instance, the product Heritage provides 28 days of brown patch control, while Tourney provides 14 days," Koch explains. "However, both products are mostly undetectable in the plant after seven to 10 days, suggesting the length of efficacy is based on a product's impact on the fungal population rather than its persistence."

With this in mind, superintendents shouldn't focus on the 7-day to 10-day phase in which fungicides are no longer present in the environment. Instead, they should emphasize the importance of fungi's recovery periods — the true evidence of efficacy length.

"Always remember that a product like Emerald, which has a recommended reapplication interval of approximately 28 days, may stunt growth of a fungus to the point that it takes 28 days for it to recover and begin to cause disease again," Koch says. "So there is no need to spray the fungus again until it's active, or else it won't absorb the fungicide anyway."

It's also important to understand the influence of fungi's hyphae. All fungicides are absorbed by the hyphae (growing tips), which can extend upward of 40 micrometers each minute. Although fungicides kill most cells, more cells still begin to grow im-

The release of fewer fungicide chemistries and higher resistance pressure on current chemistries have made it clear: The industry needs a new approach to fungicides.

PHOTO: PAUL KOCH

mediately after the fungicides have dissipated from the hyphae. Superintendents must wait until this growth is occurring again, thereby ensuring the process of killing hyphae cells can successfully continue. In doing so, they'll be able to maximize efficacy length and considerably improve the quality of their turfgrass.

Aside from the possible misconception of efficacy length, two types of fungicide resistance potentially lead to long-term fungus issues: receptor-mediated and non-receptor-mediated resistance. Receptor-mediated resistance — in which a mutation in a fungicide's binding site leads to inactivity — has been studied for a long time, leading to a relatively vast understanding of the ways in which it varies from one class of fungicides to the next.

"For example, quinone outside inhibitors (QoI) have a fairly high risk of resistance development, as only one mutation can lead to total resistance, while benzimidazoles have an even higher risk of resistance development," Koch says. "On the other hand, the risk is much lower for demethylation inhibitors (DMI), as multiple genes are involved in resistance, which requires multiple mutations to accumulate over time. This in turn leads to a gradual shift in the overall fungal population toward organisms that are more resistant."

Non-receptor-mediated resistance, however, has been studied for only the past few years. Nonetheless, this newer area of resistance study already is revealing significant information about fungicide efficacy. First, because of this resistance, fungicides can be escorted out of cells, so to speak, by "ABC transporter" molecules. Afterward, the fungicides are completely broken down (by molecules known as CYP450 monooxygenases) before they ever reach hyphae cells.

"All fungal cells have these 'transporter' metabolizing molecules, but the cells involved with non-receptor-mediated resistance have a much higher number," Koch stresses. "So superintendents must react accordingly and focus on a variety of resistance management strategies."

Continued on page FS8

Continued from page FS7

The five strategies

Although it's difficult to stop receptor-mediated and non-receptor-mediated resistance completely, both types of resistance can be slowed considerably, particularly through the following resistance management practices.

MAXIMIZE TURF HEALTH. Superintendents must have accurate mowing heights, optimal drainage mechanisms, healthy soil and facilities they can use long-term (and preferably even expand upon) for equipment and fungicide storage. Without these necessities, superintendents won't be able to maintain healthy turfgrass. The bottom line: The healthier turf is, the less likely superintendents will be reliant on chemicals.

CHOOSE THE RIGHT PRODUCT. Location is, of course, the most significant factor influencing fungicide selection. For example, dollar spot is most prevalent in the Midwest, while anthracnose is more dominant in the Northeast and Northwest. But as superintendents determine which products are most effective for their courses, they should also consider seeking advice from local university Extension specialists, industry representatives like distributors and sales reps, and fellow superintendents, especially as they consider purchasing new products.

SPRAY ONLY WHEN NECESSARY. "Remember, a fungus will only absorb a fungicide when it's active — when the fungal tip is growing," Koch states. "The more often fungicides are applied, the higher the level of resistance. Only spray when the fungicide is no longer effective and the fungus has begun to grow again."

OPTIMIZE THE FUNGICIDE APPLICATION. To ensure that fungicide efficacy endures as long as possible, it's important to confirm that water volume levels are accurate and fungicide coverage is precise. As Koch stresses, if fungicide coverage is optimal, the control of fungicide resistance will be optimal as well.

ROTATE/TANK-MIX PRODUCTS. "If superintendents rotate chemistries or tank mix multiple chemistries, individual fungal strains will likely be less resistant to multiple fungicide classes," he says. "Rotating and tank mixing also ensures that no single resistant strain of the fungus will dominate the rest of the population."

To combat diseases such as fairway dollar spot, superintendents should follow a clear set of resistance management strategies.

Looking ahead

As superintendents prepare to implement each of these resistance management strategies, Koch believes that technology — including GPS equipment and portable weather sensors — will drastically change the way they spray, ensuring they treat only areas of their courses experiencing high disease pressure. These spray changes will not only improve superintendents' bottom lines, they'll also help them minimize resistance consistently and for the long term.

"In particular, GPS technology will fine tune the parts of the courses that need to be sprayed, which reduces overlapping sprays as well as the amount of product that's released into the rough and other areas where it's not needed," he states. "Small, portable weather sensors, meanwhile, will allow for site-specific spraying as well."

Simply put, the value of spraying the correct amount of preventative fungicide at the exact location it's required can't be underestimated. Although this means of cost savings and resistance management is today overlooked by some superintendents, Koch believes that will soon be the case no longer.

"Right now, the common practice is to spray the entire golf course," he says. "But that's about to change as technology continues to advance and enter the market at a steady pace."

Michigan-based writer Chris Lewis is a frequent contributor to *Golfdom*. Along with numerous golf course profiles, he also has written on such topics as fraze mowing and the use of fungicides to maximize plant health on nursery turf.

PHOTO: PAUL KOCH

FINALLY:
A HERO IN THE BATTLE AGAINST DOLLAR SPOT!

KABUTO®:
THE DOLLAR SPOT WARRIOR.

Dollar Spot is persistent, resistant, and costs more to control than any other turf disease in the United States. Kabuto® Fungicide SC is here to end its grip on your turf and your budget.

University research and end-user trials show Kabuto provides both preventative and curative control of Dollar Spot. And Kabuto can be applied up to eight times per year as part of a resistance management program.

PBIGordonTurf.com

pbi/gordon corporation
Employee-Owned

CONTROLLING ULTRADWARF BERMUDAGRASS DISEASES

Keeping these diseases in check is possible, but an accurate diagnosis must come first.

BY ED HISCOCK

Turfgrass diseases, including diseases of the newer ultradwarf bermudagrass varieties, need four conditions for development: a susceptible host (the turf), a pathogen, a conducive environment and time. Golf course superintendents have plenty of these four factors.

What they don't always have is an accurate diagnosis of the disease giving them pounding headaches.

Is the plague of the week Pythium blight? Leaf spot? Root decline? Pythium root rot? Proper diagnosis must be the starting point for treatment, but once the disease is pinpointed, control options abound.

In an April 2018 GCSAA webinar, Maria Tomaso-Peterson, Ph.D., took listeners through the disease cycle and highlighted areas where the cycle may be broken to minimize disease incidence and severity. Tomaso-Peterson is a research professor in plant pathology at Mississippi State University and focuses her research on the novel fungal complex associated with bermudagrass decline on putting greens.

The proper befuddlement

To put webinar listeners in the proper mindset, Tomaso-Peterson quoted astrophysicist Neil deGrasse Tyson. "If a scientist is not befuddled by what they're looking at," Tyson said, "then they're not a research scientist."

Befuddlement can be easily found when superintendents attempt to identify the cause of the diseases they see. The menu is long and confusing: an abiotic disorder, a fungus, a bacterium, nematodes, insects. More than a third of samples from greens examined by labs across the country show abiotic disorders, Tomaso-Peterson noted, but that leaves a lot of room for her specialty, fungal diseases. These diseases include Pythium blight, Pythium root rot and bermudagrass decline/take-all root rot.

The first step for superintendents is to locate a turfgrass diagnostic service within their region, Tomaso-Peterson told *Golfdom* in a separate interview. "Identifying the disease, that's No. 1," she noted. But do superintendents always need a diagnostic lab? "I've worked with several superintendents over the years in diagnostics," she said, "and once we've worked through the diseases on their golf course for three to four years, with the superintendents saying, 'Oh, I think it be might be this,' then sending it in for confirmation, they became very confident in knowing what the diseases were at their golf course."

This confidence, however, is mostly related to foliar diseases like leaf spot, Pythium and Microdochium patch, Tomaso-Peterson said. "But when it comes to root diseases, that's very difficult because all the root diseases

Cottony white mycelium associated with Pythium blight may be observed in the early morning while moisture is present on the leaves.

PHOTO: CORY MESSER

develop symptoms that are similar… but most root diseases don't occur in a nice little patch… They always have to get a diagnosis because we don't know if it's *Pythium* spp. in the roots or fungi or nematodes. So most of the diagnostic questions I've received in the past are root related because the superintendents pretty much pick up the foliar diseases once they go through a season or two."

The loss of Nemacur exacerbated the situation, she said, and caused "ridiculous" nematode pressure, which has been lightened by the labeling of new control products, which "will lessen the number of nematode samples, which act in concert with these root pathogens."

Pythium diseases

Numerous species of *Pythium* are associated with foliar, root and seedling disease. "Each of these diseases are distinct," Tomaso-Peterson said. For example, *Pythium aphanidermatum* and other species are associated with foliar blight, *P. volutum* and others with root diseases, and many species cause seedling rot or damping off.

Pythium spp. "is not a true fungus," she noted, "it's in the kingdom Stramenopila and the phylum Oomycota. But because these organisms are not true fungi in the kingdom Fungi, the fungicides we use to control these Pythium diseases are specific for the Oomycota. And they have aquatic, amphibious and terrestrial habitats and are typically referred to as water molds."

Pythium blight on ultradwarf bermudagrasses, despite nearly 30 years of experience with them, started showing up only about 10 years ago, Tomaso-Peterson said. The times for the disease are late summer, early fall and in some cases, late spring. It thrives in extended wet conditions and in saturated soils and rootzones in temperatures between 65 degrees F and the mid-80s F. In summer renovations from bentgrasses to ultradwarf bermudagrasses, grow-ins with high nitrogen inputs and heavy irrigation can create a "perfect storm" for Pythium blight, she noted.

Superintendents, especially those going from bentgrass to ultradwarf bermuda, need to understand the susceptibility of these grasses to Pythium blight and root rots, Tomaso-Peterson told *Golfdom*. "The thought was, 'I'm going to bermuda, and I'm going to have minimal diseases and Pythium diseases are not going to be on the radar.' But it needs to be on the radar, especially on converted greens that have been no-tilled into old bentgrass greens."

Foliar symptoms of the disease on greens (especially dew-wetted

Continued on page FS12

Continued from page FS11

greens) include greasy, black spots on greens surrounded by a white, cottony mycelium. "In fact," Tomaso-Peterson said, "Pythium blight used to be called 'greasy spot.'" These signs can be joined by prominent black lesions on folded leaves, notably on new growth. Only species of *Pythium* cause this black, water-soaked appearance with black lesions.

Other foliar tipoffs are distinct necrotic spots and patches with a dark border and necrotic streaking on greens. "As mowers move," Tomaso-Peterson noted, "they deposit the pathogen — that's why we see the streaking. And it's as bad on ultras as on bents." Reproduction is both sexual and asexual.

Disease management

Superintendents can take a scientific or non-scientific approach to managing diseases such as Pythium blight. The non-scientific approach is simple. "We can," she said, "pray for sunshine." For some time after the adoption of ultradwarf bermudagrasses this approach may have seemed to work, she noted, because "superintendents didn't expect Pythium diseases on ultradwarf bermudagrass."

Pythium blight on ultradwarf bermuda greens may appear greasy and black due to rapid foliar tissue degradation.

And periods of sunshine after wet, damp weather can halt a Pythium disease outbreak. "It's not that it's not there," she said, "it's just that the sunshine and dry conditions shut it down."

Cultural control practices include avoiding saturated soils and improving drainage, minimizing leaf wetness with wetting agents, thatch management along with topdressing, managing nitrogen, and when Pythium blight is active, mowing when greens are dry.

Developing a chemical management program also is important. Timing, application coverage, following the spray interval and alternating modes of action using the FRAC code as a guide all are critical. And of course, follow all label rates.

Foliar lesions associated with Pythium blight are often black, rapidly expanding across the leaf blade.

The basics

Tomaso-Peterson has some advice for superintendents in all disease situations. "I recommend that superintendents do general nematode analysis to get a baseline count of nematodes on their greens. If they start seeing something off-color, or patches that might look like some kind of a foliar disease, they should go ahead and get a diagnosis so they can start developing their history profile for diseases. Once they do that, they can begin to understand what diseases might occur and at what time of year. They don't want to play catch-up."

Listen to Maria Tomaso-Peterson's entire webinar at **www.gcsaa.tv/webinars/sponsored/view.php?id=356.**

PHOTOS BY: ALAN WINDHAM (TOP); MARIA TOMASO-PETERSON (BOTTOM)

SCOUTING FOR SUCCESS

A chance encounter in the Boy Scouts led Scottie Hines, CGCS, to a life lived on some of golf's best courses.

BY SETH JONES

Scottie Hines was meant to be on a golf course. Fate wouldn't have it any other way.

Hines got his start in golf replacing divots and raking bunkers for his father, grandpa and uncles starting at age 5. A few years later he jumped at the opportunity when his father, Scott, the course accountant for Champion Lakes Golf Club in Ligonier, Pa., told him his help was needed at the club. The self-proclaimed golf rat made his first dollars in the game at age 12 by working the golf shop and as the starter at his hometown club.

As if fate hadn't already provided him an atypical head start in the game, it then sent him a guardian angel disguised in a Boy Scouts uniform. As a 13 year old, Hines' assistant Scout leader was none other than Mark Kuhns, CGCS, then the superintendent at Laurel Valley GC, Ligonier, Pa., today the director of grounds at Baltusrol GC in Springfield, N.J., (as well as the 2009 President of GCSAA and host superintendent of the 2005 and 2016 PGA Championships.)

Scottie Hines

Kuhns hired the 14 year old to work for him on the crew, and Hines stuck with Kuhns for most of the next decade-plus. Together they hosted the 1989 U.S. Senior Open (played at Laurel Valley), the 1992 U.S. Women's Open and the 1994 U.S. Open (both played at Oakmont) and the 2000 U.S. Amateur Championship (played at Baltusrol.)

"There's a lot of history there between Mark and me, we go way back," Hines says. "He's like a second father to me."

Hines fondly recalls the time when, after being on his own for five years at Riverview GC in Elizabeth, Pa., Kuhns asked him to come back to his team after he got the job at Baltusrol.

"They were 10 months from hosting the U.S. Amateur, and Mark tells me they're playing 36 temporary greens and he needed a little help," Hines laughs. "So I jumped ship and took the superintendent position at the Lower Course at Baltusrol and got my certified status while I was there."

Though Hines learned some valuable skills from Kuhns while a Boy Scout, the lessons he picked up from him on the golf course were even more important. Work ethic, attention to detail and team building were all high on the list, but the number one thing, Hines says, was giving back to the industry.

"It's a great living, a great office, you have to give back, I took that from Mark on day one," Hines says. "Whether it's service on the board,

Continued on page FS14

Continued from page FS13

hosting events, volunteering... I've taken that to heart."

Pushing the envelope

For the last 16 years, Hines, now a certified golf course superintendent, has been the director of agronomy at Windsong Farm GC in Independence, Minn. He's been there since before the grand opening in 2004, taking the course from "dirt to grass" and enduring two ownership changes over the years.

"It's been a great run. The current owner, Dave Meyer, has been a great supporter of me and my staff and of golf in general," Hines says. "He's invested money into the golf course. If you're not making changes and advancing the golf course every day, it's a mistake. I believe if you're sitting still you're really backing up."

The course, a John Fought/Tom Lehman design, is known for its huge expanses of fairways and how nicely those fairways nestle into the surrounding landscape. Native grasses dot the rough — little bluestem, big bluestem, prairie dropseed and sideoats are the common grasses, with some fescue mixed in.

The crew at Windsong during the summer ranges from 28 to 35 people, depending on how many part-timers Hines can attract.

"Our biggest challenge is people, that's industry wide right now," Hines says. "Trying to find people to man mowers is a challenge. (The course has) got to be good from the entrance to the 18th green, as good as we can get it. It's a challenge, but it's what I signed up for!"

The course hosts the University of Minnesota's Gopher Invitational every fall. From the tips, Windsong Farm plays 7,600 yards to a par of 71.

"It can test them. We are big fans of firm and fast, it doesn't necessarily have to be green, it just has to be

SCOTTIE'S FABULOUS GOLF JOURNEY

Scottie Hines, CGCS, has been in the golf business since he was 12 years old. His wife, Kristin, played golf for the University of Minnesota and today is a Class A PGA professional teaching at Mendakota CC (she also is an early childhood development specialist in the Twin Cities.) Even his sister married a golf professional.

"I was a golf rat," Hines reflects. "I was always around the golf course, and when I was away, I couldn't wait to get back. The golf roots run deep for me and my family."

Here's a look at Hines' fabulous golf journey:

1973-1980 – Raked bunkers and replaced divots for his dad, uncles and grandpa

1980-1981 – Worked golf shop at Champion Lakes GC, Ligonier, Pa.

1982-1990 – Student assistant superintendent under Mark Kuhns, Laurel Valley GC, Ligonier, Pa.

1986-1993 – Earned B.S. in agronomy at Penn State University

1990-1995 – Assistant superintendent under Mark Kuhns, Oakmont (Pa.) CC

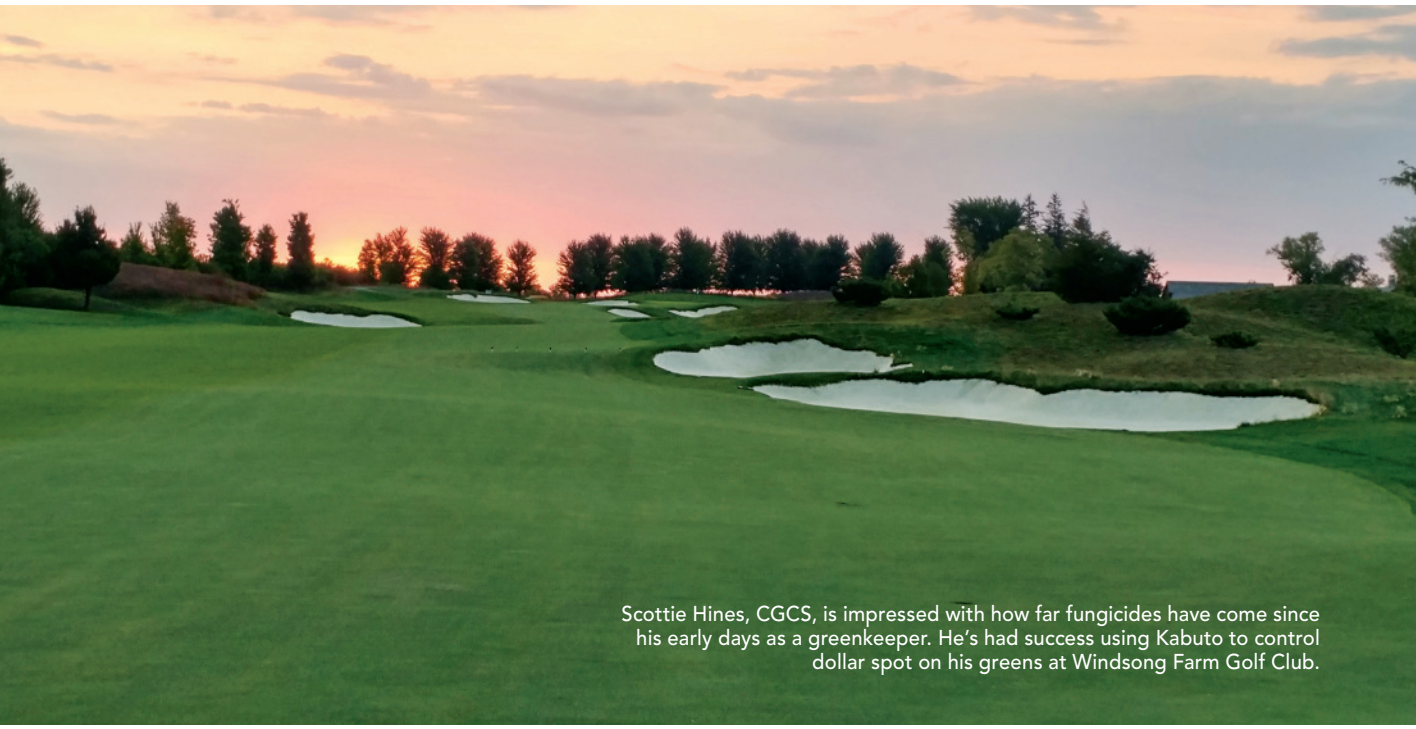
1995-1999 – Superintendent at Riverview GC, Elizabeth, Pa.

1999-2002 – Superintendent, Lower Course, Baltusrol GC, Springfield, N.J.

2002-present – Director of Agronomy, Windsong Farm GC, Independence, Minn.

Tournaments hosted: 1989 U.S. Senior Open, 1992 U.S. Women's Open, 1994 U.S. Open, 2000 U.S. Amateur, 2009 Big 10 Men's Championship

The Hines family (from left, Kristin, Olivia, Leighton and Scottie) enjoys Friday evenings at the curling rink.



Scottie Hines, CGCS, is impressed with how far fungicides have come since his early days as a greenkeeper. He's had success using Kabuto to control dollar spot on his greens at Windsong Farm Golf Club.

alive," Hines says. "We have a great staff, I have a superintendent under me and two assistants who are all world-class. We have a great irrigation system. We push the envelope every now and then and have a little fun with it."

A great way to work

The Pennsylvania native loves growing grass in Minnesota. Winters can be rough, but Hines enjoys making adjustments once the snow has melted. Insect pressure is minor — cutworms here and there, he says.

His biggest challenge outside labor is dollar spot, he says. But even that is under control.

"We use a bunch of products (to control dollar spot.) We started experimenting with Kabuto from PBI-Gordon and that is showing some good success for us," he says. "The nice thing about dollar spot is it's easily managed, and we know where to monitor to get ahead of it and stay ahead of it. This is my 17th year here; after a while you figure it out."

Hines is impressed with how far fungicides have come since the days he was slinging Calochlor early in his career.

"To see where we are now with the advancement of chemistries is fantastic," he says. "Much lower use rates, much more environmentally friendly, much more user friendly. The chemical companies are making mixing so much easier. Everybody is talking sustainability — lower use rates, more environmentally friendly, longer residual, longer intervals between spraying. All that is vitally important to the environment. Let's face it, if you're running a golf course and you're not an environmentalist, you're in the wrong business."

Hines and his wife, Kristin, have two children, son Leighton, age 8 and daughter Olivia, age 6. Kristin is an accomplished golfer, having played collegiately for the University of Minnesota. She has a handful of state match play and mixed play championships to her name, and works as a Class A PGA professional teaching at Mendakota CC in Mendota Heights, Minn.

"Kristin is a great supporter of me, and this is obviously a difficult job at times," Hines says. "With a compressed summer season here in Minnesota, if the sun is shining, I'm here. It's nice to have someone in the golf industry who understands the business."

Hines reflects on his years in the business and how his kids are now taking a shine to the game and being on the golf course. He calls his job and the state of Minnesota "fabulous."

"The people here are fantastic. The staff is great. It's beautiful here," he says. "I love being on the golf course, I love bringing my family, I love bringing my two dogs to work with me every day and I love playing. What a great office. What a great way to come to work every day."

PHOTOS BY: SCOTTIE HINES

FOR YOU IT'S A MATTER OF PRIDE.

PBI-Gordon helps protect your course and your reputation.

A golfer might brag about a good day on your course, but make no mistake: that's your turf, your mission, and your business card. And PBI-Gordon is dedicated to helping you keep it looking great. For almost 50 years, PBI-Gordon has offered innovative, effective turf solutions for the golf industry, from original Trimec® Turf Herbicide to new Kabuto® Fungicide SC.

▶ For more information, visit GordonsProfessional.com or contact Ray Funkhouser at 804.334.6372.

PBIGordonTurf.com

pbi/gordon corporation
Employee-Owned

Hosted by Clark Throssell, Ph.D. | *clarkthrossell@bresnan.net*

Super Science

Primo applied every 100 GDD at 5 fl. oz./A resulted in early-season injury (left), while Primo every 200 GDD at 2.5 fl. oz./A did not (right).

PHOTOS BY: AUSTIN BROWN

// LOOK TO THE GDDS

PRIMO MAXX: TO REAPPLY OR NOT?

By Austin Brown, Jim Harris and Scott McElroy, Ph.D.

Making the decision to apply a plant growth regulator like Primo Maxx (Syngenta, trinexapac-ethyl) on ultradwarf bermudagrass (*Cynodon dactylon* x *C. transvaalensis*) is easy. In addition to growth suppression, Primo can provide enhanced color, increased density and more consistent green speed. Unfortunately, as trinexapac-ethyl is degraded, a period of accelerated growth (rebound) may occur, resulting in decreased quality. To maintain constant growth suppression and prevent rebound, sequential applications must occur at the maximum suppression point, where growth is maximally suppressed by the prior application.

Predicting this point is difficult because trinexapac-ethyl degradation rate increases as temperature increases. Basing sequential applications on heat accumulation approximated by growing degree days (GDD) proved to be a solution to this problem on creeping bentgrass putting greens.

Two field trials at Auburn University investigated GDD-based reapplication schedules for ultradwarf bermudagrass putting greens. The first trial evaluated growth following a single application of Primo (5 fl. oz./A) at eight different dates. Results indicate the maximum suppression point occurred 14 days after treatment during the cool weather of May but only after 10 days in the heat of July. Importantly, the GDD accumulation at the maximum suppression point essentially was equivalent for May and July. This indicates that GDD predict the maximum suppression point more accurately than calendar days.

The second trial tested four GDD reapplication schedules (every 100, 200, 400 and 600 GDD) and two Primo rates (2.5 and 5 fl. oz./A). The 100-GDD and 200-GDD intervals at both rates provided suppressed growth all season, but the 100 GDD at 5 fl. oz./A adversely affected quality early in the season.

Both trials indicate applying Primo every 200 GDD at 2.5 fl. oz./A will provide suppressed growth and enhanced quality all season.

*Find GDD information and a GDD tracker at **auburnturf.com.**

Austin Brown, Jim Harris and Scott McElroy, Ph.D., are at Auburn University. You may reach Brown at austinbrown@auburn.edu for more information.

NEWS UPDATES

BIOSAFE SYSTEMS RELEASES NEW BIOFUNGICIDE

BioSafe Systems has released its PVent biofungicide. This development was spearheaded through a strategic partnership between two family-owned businesses, BioSafe Systems and Lallemand Plant Care.

PVent's active ingredient — *Gliocladium catenulatum* Strain J1446 — was originally isolated from natural Finnish soils, providing adaptation traits like an enhanced ability to thrive and reproduce across broad temperature and humidity ranges.

PVent is a highly concentrated EPA-registered fungicide and is powered by three modes of action: it is biologically programmed to rapidly colonize its host environment to defend against attack, it will destroy even the most resilient plant pathogens, and it has prolonged effectiveness and defense against future pathogens for up to four weeks after treatment.

PVent controls soilborne plant pathogens, foliar pathogens and is labeled for use on greenhouse/nursery crops and agricultural crops grown indoors. PVent can be applied by soil substrate or hydroponic solution incorporation, drench or foliar spray. When partnered with BioSafe Systems' PAA+ line of products, PVent provides broad-spectrum control of economically destructive plant diseases, the company said.

PVent is a WG formula that will be available in 0.5-, 1- and 2-pound packaging.

"WE WANTED TO ANSWER THE QUESTION OF WHETHER FOLIAR FERTILIZATION ALONE WOULD DECREASE SOIL NUTRIENTS OVER TIME."

Miyuan Xiao

(see story on page 48)

//A DECREASE OVER TIME?

Foliar fertilizers and soil nutrient levels

By Miyuan Xiao, Kevin W. Frank, Ph.D., and Thomas A. Nikolai, Ph.D.

Foliar fertilization is the application of a dilute solution of plant nutrients to foliage with the objective of nutrient uptake by leaves. Initial interest in foliar fertilization began in the 1990s over concern about picking up granular fertilizers during mowing of putting greens, and the practice has become commonplace.

Some of the perceived advantages of foliar fertilizers compared to granular fertilizers are increased efficacy, accuracy and bypassing dysfunctional root systems during stress periods.

Past research on foliar fertilizers primarily has focused on nutrient uptake efficiency and turfgrass responses such as quality, clipping yield and root biomass. The effect of foliar fertilization on soil nutrient levels has not been researched. We wanted to determine the effects of foliar and granular fertilizers alone and in combination on creeping bentgrass performance and on soil nutrient levels. Specifically, we wanted to answer the question of whether foliar fertilization alone would decrease soil nutrients over time.

THE EXPERIMENT SETUP

We conducted research on a Penn A4 creeping bentgrass (*Agrostis stolonifera L.*) putting green at the Hancock Turfgrass Research Center at Michigan State University (Figure 1). There were two root zone mixes, an 80:20 (sand:peat, v/v) constructed to USGA guidelines, and a sandy clay loam (58 percent sand, 20.5 percent silt and 21.5 percent clay).

We initiated fertilizer treatments in June 2009. There were six fertilizer treatments, including three granular fertilizers applied approximately every 30 days; a foliar fertilizer applied at two rates approximately every 15 days; and a granular and foliar combination (we applied the granular approximately every 30 days and the foliar approximately every 15 days) (Table 1).

FIGURE 1

The experimental site in spring.

We collected soil samples to a 4-inch depth in October 2009 and June and October in 2010 and 2011. We measured soil P using Olsen extractant (0.5 M $NaHCO_3$) as soil pH was greater than 7.4, measured soil K using 1M ammonium acetate and measured soil nitrate N using 1 M KCl. We visually rated turfgrass quality every two weeks on a scale of 1 to 9, with 1 equaling poor, 6 equaling acceptable and 9 equaling excellent.

Following granular fertilizer application, we applied 0.25 inch of water to move fertilizers into the canopy. We didn't collect clippings for two days following granular fertilizer application to avoid picking up granular fertilizers. We irrigated the evening following foliar fertilizer applications and mowed plots, with clippings collected the following morning. Throughout the research we irrigated every other day, accounting for natural precipitation, to return 75 percent of reference potential evapotranspiration (ET_p).

RESULTS

Soil Nutrients

There were no trends in soil nutrients increasing or decreasing over the three years of our research (Table 2). Foliar fertilizer applications did not deplete soil NO_3-N, P, and K after three years of fertilizer application. With respect to P the foliar and foliar 2X treatments were applied at 0.25 and 0.5 lb. P/1,000 sq. ft. per year, respectively. It previously was

PHOTO BY: KEVIN FRANK

TABLE 1

Treatment list

	Nitrogen Rate (lb. N/1,000 sq. ft.)			P Rate (lb. P/1,000 sq. ft.)		K Rate (lb. K/1,000 sq. ft.)	
Treatment	Per application	Per month	Annual total	Per Application	Annual total	Per Application	Annual total
Untreated control	NA†	NA	NA	NA	NA	NA	NA
Organic‡	0.5	0.5	3.0	0.1	0.6	0.2	1.2
Methylene urea§	0.5	0.5	3.0	NA	NA	NA	NA
Urea¶	0.5	0.5	3.0	NA	NA	NA	NA
Foliar#	0.125	0.25	1.5	0.02	0.25	0.03	0.3
Foliar 2X††	0.25	0.50	3.0	0.04	0.5	0.05	0.6
Combination‡‡	0.5	0.5	3.0	0.07	0.8	0.09	1.1

† No fertilizer application.

‡ Grigg Brothers All Natural Organic (10N-2P-4K), Grigg Brothers P.O. Box 128, Albion, ID 83311.

§ Methylene urea (40N-0P-0K), The Andersons, P.O. Box 119., Maumee, OH 43537.

¶ Urea (46-0-0), The Andersons, P.O. Box 119, Maumee, OH 43537.

Grigg Brothers Gary's Green (18N-3P-4K) applied twice per month, Grigg Brothers P.O. Box 128, Albion, ID 83311.

†† Grigg Brothers Gary's Green (18N-3P-4K) applied twice per month, Grigg Brothers P.O. Box 128, Albion, ID 83311.

‡‡ Grigg Brothers Turf Rally (16N-4P-8K) and Grigg Brothers Gary's Green at 0.125 lb. N/1,000 ft.2 rate was used for the granular and foliar combination. Turf Rally was applied at 0.25 lb. N/1,000 ft.2/month and Gary's Green was applied twice per month.

seen that applying 3 lbs. N/1,000 sq. ft. per year to a creeping bentgrass fairway with clippings removed decreased soil test P values by 3 ppm. However, applying 0.24 lbs. P/1,000 sq. ft. per year would maintain soil test P values. Our results for the foliar and foliar 2X treatments agree with the previous findings in that the applied P maintained soil test P levels. The granular treatments that applied only N also did not deplete soil nutrients over time, but this may be because of the timeframe over which the research was conducted. If the research were to continue for additional years, soil nutrient depletion may occur.

There were differences in soil nutrient levels (NO_3-N, P and K) between the native soil and USGA root zone (Table 2). As expected, the native soil — which contains silt and clay fractions — had higher soil NO_3-N, P and K levels than the USGA root zone across all sampling dates.

Although soil NO_3-N is highly variable, the highest NO_3-N level for either root zone was for the October 2011 sampling, when the USGA and native soil root zones had NO_3-N of 2.3 and 4.3 ppm, respectively. Soil P for both root zones varied over time within a narrow range. The range in soil P for the USGA root zone was 14.5 to 19.6 ppm and 51.3 to 57.5 ppm for the native soil. There were no significant differences in soil K in the USGA root zone between the first sampling in October 2009 and the last sampling in October 2011. The native soil in the

Continued on page 50

TABLE 2

Mean soil nitrate nitrogen (NO_3-N), P and K for the USGA and native soil root zone.

	2009 Oct.	2010 June	2010 Oct.	2011 June	2011 Oct.
Rootzone	Soil nitrate-N (ppm)				
USGA Native	0.6 b†C‡ 1.8 aB	1.3 bB 1.4 aB	0.4 bC 1.0 aB	0.5 bC 1.2 aB	2.3 bA 4.3 aA
USGA Native	Soil P (ppm)				
	19.6 bA 55.5 aA	17.1 bAB 51.3 aB	14.7 bB 51.9 aB	16.0 bAB 57.5 aA	14.5 bB 54.3 aA
USGA Native	Soil K (ppm)				
	16.4 bAB 82.8 aB	17.8 bA 75.1 aC	19.3 bA 76.9 aC	18.3 bA 88.9 aA	13.2 bB 75.3 aC

†Lowercase letters indicate significant differences at the 0.05 probability level within columns for months in the same year for each nutrient.

‡Capital letters indicate significant differences at the 0.05 probability level within rows in the same year for each root zone.

TABLE 3

Mean creeping bentgrass quality for the different fertilizer treatments in 2010 and 2011.

Fertilizer treatment	Quality†						
	April	May	June	July	August	Sept.	Oct.
	2010						
Untreated control	5.9 c‡B§	5.8 dB	6.3 bA	6.3 dA	6.2 cA	6.1 cAB	5.8 cB
Organic	6.7 abC	7.9 aA	7.5 aB	7.4 bB	7.4 bB	7.5 aB	7.4 abB
Methylene urea	5.9 c‡B§	5.8 dB	6.3 bA	6.3 dA	6.2 cA	6.1 cAB	5.8 cB
Urea	7.2 aA	7.2 abA	7.3 aA	6.8 cB	7.3 bA	7.3 abA	7.2 bA
Foliar	6.2 bD	6.6 cC	6.8 abC	7.7 abA	7.3 bB	6.9 bBC	7.3 bB
Combination	6.6 abC	7.3 abB	7.5 aB	8.2 aA	7.8 aAB	7.6 aB	7.9 aA
Foliar 2X	6.6 abD	6.9 bcD	7.2 aC	8.3 aA	7.8 aB	7.6 aB	7.7 aB
	2011						
Untreated control	4.0 cD	4.8 cB	4.5 cC	5.1 cA	5.3 cA	4.9 cAB	5.0 bAB
Organic	6.2 aC	7.0 bB	6.9 abB	7.6 aA	7.6 abA	7.0 abB	7.3 aAB
Methylene urea	5.7 abD	7.0 bB	6.5 bC	7.6 aA	7.6 abA	6.8 bB	7.6 abA
Urea	5.3 bD	6.9 bC	6.7 bC	7.3 aB	7.7 abA	6.9 abC	7.8 aA
Foliar	4.7 cD	6.8 bB	6.5 bBC	6.4 bC	7.3 bA	6.7 bB	7.5 bA
Combination	5.7 abD	7.6 aB	7.4 aB	6.9 abC	8.1 aA	7.5 aB	7.8 aA
Foliar 2X	5.3 bC	7.5 aB	7.6 aB	7.4 aB	7.7 abA	7.4 aB	7.9 aA

† Quality was rated from 1 to 9, with 1 = poor, 6 = acceptable, and 9 = excellent.

‡ Lowercase letters represent significant differences at the 0.05 probability level within columns for month in the same year.

§ Capital letters indicate significant differences at the 0.05 probability level within rows for fertilizer treatment in the same year.

Continued from page 49

June 2011 sampling had the highest soil K while the June and October 2010 and October 2011 samplings had the lowest soil K. The range in soil K for the USGA root zone was 13.2 to 19.3 ppm, and the native soil was 75.1 to 88.9 ppm.

Soil P and K for the USGA root zone was below the MSU soil testing lab optimum guidelines of 20 to 30 ppm for P and 50 to 75 ppm for K, however, turfgrass quality (rating greater than 6) was acceptable for all fertilizer treatments. Recommended soil P and K sufficiency levels for turfgrass growth differ according to region, and laboratory and soil-testing extractant tend to be conservative to ensure nutrient deficiencies don't occur.

The MSU soil testing lab uses the Sufficiency Level of Available Nutrients (SLAN) soil testing theory. The SLAN theory uses the amount of available nutrient extracted, expressed in ppm, to determine the need for fertilization. An alternative to SLAN guidelines, called the Minimum Level of Sustainable Nutrition (MLSN) has been introduced. MLSN identifies the minimum level of soil nutrients required for good turfgrass performance, and these levels are lower than optimum levels of SLAN.

For example, using MLSN, the highest Olsen soil test P level when P fertilization is recommended is 5.4 ppm, whereas the MSUSPNL guideline is 12. Although our soil test P levels did not decline to the MLSN 5.4-ppm level, our results tend to support that P and K levels below typical SLAN optimum levels can support healthy turfgrass growth.

Turfgrass Quality

The combination and foliar 2X treatments had the highest turfgrass quality ratings throughout 2010 and 2011 (Table 3). Every two-week application of the combination and foliar 2X treatments had significantly higher turfgrass quality than the monthly methylene urea, urea and organic treatments on most dates. We think the difference in turfgrass quality ratings among the two-week applications of the combination and foliar 2X treatments and the monthly applications of granular methylene urea, urea and organic treatments was most likely due to the frequency of application, but our

experiment was not designed to specifically answer that question.

Our results are similar to a 2008 study finding that combining liquid and granular fertilizers resulted in higher turfgrass quality. The foliar treatment with a lower N rate than all other treatments had acceptable quality throughout the research except on the April 2011 sampling date, when all treatments had unacceptable quality because of cool spring temperatures delaying spring green-up.

There were significant differences in turfgrass quality between the two root zones. There was only one date in three years — June 2009 — when turfgrass in the USGA root zone had higher quality than turfgrass in native soil. In 2010, turfgrass in the native soil had higher quality than turfgrass in the USGA root zone on five of seven dates, and there was no difference on two dates. In 2011, there were differences between root zones only for the June rating. Turfgrass in the native soil had higher quality. All quality ratings were above the minimum acceptable level of 6 except for April 2011.

NO DECREASED LEVELS SEEN

None of the fertilizer treatments, including the foliar treatments, decreased soil NO_3-N, P and K levels after three years of application. Every two-week application of the combination and foliar 2X treatments resulted in higher turfgrass quality than the monthly methylene urea, urea and organic treatments. The foliar treatment, applied at one half the N rate of the other fertilizer treatments, maintained acceptable turfgrass quality throughout the research. Golf course superintendents who are using only foliar fertilizers should monitor soil tests to ensure nutrient levels are not declining, but given the timeframe and conditions of our study, there should be minimal concern that foliar fertilizers containing phosphorus and potassium deplete soil nutrients.

Miyuan Xiao is a former graduate student at Michigan State University and current graduate student at University of Guelph. Kevin W. Frank, Ph.D., and Thomas A. Nikolai, Ph.D., are turfgrass scientists at Michigan State University. You may reach Frank at frankk@msu.edu for more information.

References

Beard, J.B., and H.J. Beard. 2005. Beard's turfgrass encyclopedia for golf courses, grounds, lawns, sports fields. Michigan State Univ. Press, East Lansing, MI.

Gaussoin, R., C. Schmid, K. Frank, T. Butler, H. Liu, and J. William III. 2009. Foliar uptake of nutrients applied in solution to creeping bentgrass (Agrostis palustris Huds.), annual bluegrass (Poa annua var. reptans (Hausskn.) Timm) and ultra-dwarf bermudagrass (Cynodon dactylon x C. transvaalensis Burtt-Davy). In: The Proceedings of the International Plant Nutrition Colloquium XVI, Univ. of California-Davis, Davis, CA. 26-30 Aug. 2009. Dept. of Plant Sciences, Univ. of California, Davis, CA. p. 1-10.

Guertal, E.A. 2010. Fertilization of bentgrass with commercial foliar products: greenhouse evaluations. *App. Turf Sci.* doi:10.1094/ATS-2010-0914-01-RS.

Kussow, W.R. 2004. Managing soil phosphorus. *Golf Course News.* Feb. 2004. p. 58.

Stiegler, J.C., M.D. Richardson, and D.E. Karcher. 2011. Foliar nitrogen uptake following urea application to putting green turfgrass species. *Crop Sci.* 51:1253-1260.

Stowell, L., and M. Woods. 2012. Minimum levels for sustainable nutrition (MLSN). *In* The Bouyoucos Conference on the Advances in Research on Soil Biological, Chemical and Physical Properties for Sustainable Constructed Rootzones. p. 21.

Totten, F.W., H. Liu, L.B. McCarty, J.E. Toler, and C.M. Baldwin. 2008. Efficiency of foliar versus granular fertilization: A field study of creeping bentgrass performance. *J. Plant Nutr.* 31:972-982.

Ad Index

Companies featured in this issue

Golfdom

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

Stop the swatting

Timothy Gibb, Ph.D., is an entomologist at Purdue University. He has worked on numerous insect problems throughout his career, including turfgrass pests and insects that affect human health. You may reach Tim at gibb@purdue.edu for more information.

Q What are the concerns about mosquitos to golfers and maintenance staff?

Mosquitos can be a nuisance to golfers and staff. A large mosquito population may keep golfers from playing a specific golf course, which hurts revenue. Several species of mosquitos common on golf courses may carry West Nile virus or similar diseases that when transmitted to a person can cause serious and long-term health problems.

Q What is the general life cycle of mosquitos?

Mosquitos either overwinter as eggs or pass the winter as adults in a hibernation-like state. In either case, they resume activity in spring once enough heat units have accumulated (similar to GDD in plants). A hard freeze or two in fall signals the end of mosquito season.

There can be many generations of mosquitos each year. Adult female mosquitos lay eggs in stagnant or slow-moving water and under ideal conditions (warm water) can develop into adults in 10 to 14 days. In natural settings, the mosquito population is highest in spring and fall when there tends to be more water present, and lower in the summer when conditions are drier.

Adult mosquitos on golf courses tend to congregate in protected and shaded areas, generally not in direct sunlight during the day or where even slight breezes occur. They are more prone to bite in early morning or evening hours.

Q What is the first step in controlling mosquitos on a golf course?

Good sanitation is the first step in controlling mosquitos. The mosquito species typically found on golf courses are container breeders, meaning females lay eggs in water trapped in artificial containers such as discarded tires, buckets, birdbaths, unused machinery, ruts left by machine traffic and in some cases inside irrigation valve boxes where water stands. Low areas where water collects, at least seasonally, are attractive mosquito egg laying sites.

Prevent egg laying by cleaning up all artificial sites that hold water and also consider draining low areas that hold water.

Q What can golfers and maintenance staff personnel do to minimize mosquito bites?

Start off by wearing long-sleeved shirts and long pants. Cover as much exposed skin as possible. Mosquitos are attracted to dark colors, so wear light-colored clothing.

Liberally apply a repellant that contains DEET in a concentration of 20 percent to 30 percent. Avoid shaded areas or areas with dense vegetation where mosquitos congregate, especially during the morning or evening hours, when they are most likely to bite.

Q What cultural practices, beyond good sanitation, can superintendents take to minimize mosquito populations on golf courses?

Encourage a steady flow of water in ponds and develop a natural ecosystem for fish and other organisms that eat mosquito larvae. In areas of occasional flooding, superintendents may add discs or pellets impregnated with Bti (*Bacillus thuringiensis* subspecies *israelensis*) to the water to control mosquito larvae. Bti is a naturally occurring soil bacterium and does not pose a threat to people or water supplies.

Q What about using a fogger to apply an insecticide for mosquito control?

A fogger generates a fine mist or fog of insecticide. The fog of insecticide is only effective on adult mosquitos and only persists for one day. After one day, adults from untreated areas move into the previously treated areas and the mosquito problem is back. A fogger used for mosquito control is most effective when applied the morning before a special event like an outdoor wedding or other social occasion, or the day of an important tournament. Target the fogger on shaded, high-vegetation areas where adult mosquitos are found.

Using long-lasting insecticides to treat mosquito larvae in a pond is sometimes necessary but should be used only as needed and based on frequent larval surveys. Keep in mind that insecticides may upset the ecosystem of the pond. If natural predators are harmed or prevented from consuming mosquito larvae, such treatments can result in a continued reliance upon insecticides in the pond.

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

BECAUSE TURF TOOLS WERE ONLY THE BEGINNING.

Introducing our new line of maintenance-free golf course accessories. They're beautiful, durable, and made completely of recycled plastic. Miltona is known for crafting top-of-the-line turf tools, and we're excited to bring that same expertise to our new line of accessories. We also ship and deliver faster than anybody. See the entire collection at Miltona.com.

MILTONA
TURF TOOLS & ACCESSORIES

The Shop

// MUST-HAVE NEW EQUIPMENT

1

2

3

1 | BB650 landscape edger

The versatile BB650 Landscape Edger from **BLUEBIRD** creates seamless edges for beds in a fraction of the time it would take to do by hand. Optional shields and blades allow an operator to make quick work of tiring tasks such as installing plastic edging, landscape lighting and paver bricks. Each unit features a 5.5-hp Honda GX engine with a heavy-duty chain drive system and centrifugal oil bath clutch for enhanced performance and durability. The removable shield also provides easy access for maintenance and cleaning without tools.

Bluebirdturf.com

2 | Ninja GPS spray control system

FROST'S Ninja GPS spray control system has been proven over the last six years to have the best features and best performance available, according to the company. It's remarkably easy to use, providing guidance, rate control and operating nozzles individually, and two controlling nozzles at each position for faster speeds and variable rate applications. Stepper motor technology at the nozzle provides instant action and incredible reliability. Operators can spray freestyle or from prescribed maps with easy view of jobs done. It can be installed on new and existing sprayers.

Frostserv.com

3 | RB-80 spreader

Featuring a sturdy steel frame and maintenance-free gear casing, the RB-80 large-capacity turf application spreader from **ECHO** is intended for turf applications such as seeds, fertilizers, herbicides and pesticides, but also can be used for other free-flowing materials such as ice melt. The spreader's oversized hopper contains a patented auger to help aid clumps of material to flow. The large blade design pulls material toward the opening and is double fastened onto the gear cases so it doesn't come loose. A 100-lb. version also is available.

Echo-usa.com

CHECK OUT MORE NEW EQUIPMENT ONLINE

To stay up to date on all the latest products and services, visit **golfdom.com/category/products**

4 FairwayiQ management system

FAIRWAYIQ and taskTracker give you real-time information on staff and equipment to increase productivity and lower costs. Sensors are installed in mowers, utility carts, sprayers and bunker rakes. Data is collected in the background on equipment location, usage patterns, routes and task performance. Get the big picture on everything that matters without being a technology expert. It answers the following questions: Are my fairway mowers getting equal usage? Have we cleared the No. 3 green in time? Who is my best performer and who needs training? How can we work more in between play? What is the total cost to maintain hole 13?
Fairwayiq.com

5 PondHawk aeration system

Nearly all ponds need management to help keep the habitat, water quality and clarity in a healthy balance. From **LINNE INDUSTRIES**, the PondHawk is a solar powered subsurface aeration system that works without the need for grid electricity. The construction is durable and reliable, working year round to aerate the water, even under partly cloudy or freezing conditions. Proper aeration minimizes algae and pond scum and reduces or eliminates the need for repeated chemical treatments.
Linneindustries.com

6 Air-o-lator aerator

AQUARIAN aerators are designed to ensure quality water management for ponds and lakes. Without sufficient oxygen levels in your ponds, these bodies of water will become septic, smelly and unsightly, and if used for irrigation could damage greens and fairways. When properly installed and maintained, aerators can ensure proper aeration, thereby keeping water fresh, vibrant and healthy. Good water management means protecting water so that people, as well as the environment, do not suffer. Today's modern surface aerators are energy efficient, highly effective, affordable and easy to install.
Airolator.com

The 19th Hole with...

Greg Rounds

SUPERINTENDENT // Sunset Ridge CC, Northfield, Ill.

What can I get you? Tito's, rocks, two limes and a splash of water.

Tell me about your family. I have a beautiful, loving wife of 10 years, Brenna, and we have two kids, daughter Riley is 8, son Parker is 4 and a half.

Have the kids done anything to surprise you lately? I have cautious kids, which is a good thing. My son, in T-ball, for whatever reason, when it's his turn to go up to bat, he likes to walk backwards up to the plate, while looking at the crowd. I'm like you, I just laughed when I saw it.

What are your sports teams? It all starts with my alma mater, Illinois, the Fighting Illini. After that, everything Chicago: Bears, Cubs, Blackhawks, Bulls.

Tell me about Sunset Ridge. It's a little under the radar. It's a 1923 William Diddel design. Diddel was one of the charter members of the American Society of Golf Course Architects. Sunset Ridge is one of three Chicago designs he did. I came here 15 years ago for a major renovation. We regrassed greens, tees, bunkers. I'm only the fifth superintendent in the club's 95-year history. It's a great place to work. It's a nice family club and it's an active club, too.

How big is your crew? I've got a crew of 23. Well, that's the number I want. I'm at 19 right now and still searching for the other four. It's extremely tough, it just gets harder and harder.

What's your favorite tool in the shop? The job board. We use Google Chrome and Google Sheets to write our job boards, we project it upstairs and have it on a few TVs downstairs. It helps efficiency in getting the message out to the crew.

Look into your crystal ball. What do you think the big story will be in our industry in five, 10 years? Back to what we were just talking about... it's labor, and autonomous equipment. It's expensive, but the cost of minimum wage, health insurance, liability, workers' compensation... it's going to get easier and easier to sell. When I went into my capital budget meeting, one of the first things a board member asked me is, "How long do you think it'll be until we have autonomous equipment?" That shocked me that these guys are aware of it and somewhat expect it. Hopefully it's closer to five years away than 10.

This summer you host the Western Amateur. If a genie granted you one wish during tournament week, what would you wish for? 50-degree nights and no rain.

Is that possible in Chicago? Anything is possible in Chicago.

As interviewed by Seth Jones, May 14, 2018.

MAIN PHOTO BY: ABBY HART / WIKI COMMONS (FIGHTING ILLINI) / MELANIE CUMMINGS (TBALL TEAM)

ENDS JUNE 30

GCSAA Members Only.

Find Your Inner Pro.

Get Exclusive Training "on-the-go."

LAST CHANCE TO FINISH

CSI PRO TRAINING

Visit CSIProTraining.com

START NOW

Watch them all for a $50 Gift Card!

NEGATE® 37WG | STROBE® 50WG | FAHRENHEIT™ | ENCLAVE®
NIMITZ® PRO G | TAURUS® TRIO G | TODAL | SEDGEMASTER | DITHIOPYR 2L

Apply the latest trends in the field.

Watch anytime, anywhere.

Instant $ when completed!

QUALI-PRO IN PARTNERSHIP WITH GCSAA

#CSIPro

Innovation you can apply.
Call 800-242-5562
quali-pro.com
@quali_pro @qualipro

NO ONE CAN PUTT WHILE PYTHED.

Segway® Fungicide SC sinks Pythium disease!

Missing a two-foot putt is maddening, but seeing Pythium destroy healthy turf can drive you over the edge. Stop it with Segway® Fungicide SC.

Segway delivers outstanding protection against Pythium disease, including root dysfunction, blight, damping-off, and root rot. Segway lasts up to 28 days, and has no known cross-resistance with existing fungicides, making it ideal for your rotation program.

We can't help you with your putting, but we can help you stop Pythium: Segway.

PBIGordonTurf.com

pbi/GORDON CORPORATION
Employee-Owned