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- The great superintendent slim down
- No. 1 tip for fall armyworm detection
- Got salt? Experts share fertilization needs

A **NORTH COAST MEDIA** PUBLICATION **VOL. 78 // NO. 8**

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- The great superintendent slim down
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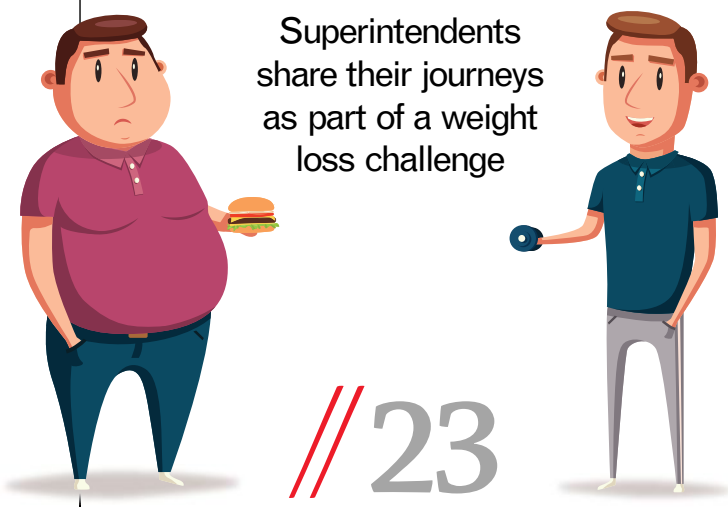

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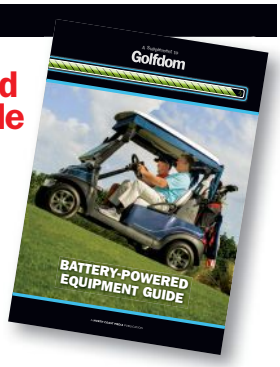

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"LIV Golf and college conference realignment have sent two of my favorite sports spheres into a tailspin."

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

An ever-evolving sports world

Greetings from an evening at the Hall of Justice, my detached garage where I sneak away and watch sports on mute while listening to music on my jukebox. I'm spinning a mix of '90s alternative rock while my kids and their neighbor friends sit on the broad side of the barn watching a movie. I've got 2019's *Shazam!* on the projector. No one has said anything about the bat that swoops by on occasion.

Yeah, no sports on the TV right now. It's Major League Baseball's All-Star break, always a low time in sports watching. Probably a good thing …

My sports world has been tumultuous lately, between professional golf and college sports. LIV Golf and college conference realignment have sent two of my favorite sports spheres into a tailspin. I don't like it, but maybe my advancing age is keeping me somewhat levelheaded this go-around.

Me and getting worked up about sports I have *zero effect on* goes back a few decades. It started as a kid when my family, season ticket holders for Wichita Wings indoor soccer, found ourselves at our first "Save the Wings" banquet. Who knows how much my dad forked out for those seats at the table? I'm guessing it wasn't in the family budget. It was so important to me, and he knew it.

After about the third straight season of attending a "Save the Wings" banquet my dad asked aloud, "How many times do we need to save these guys?"

A few years later, I freaked out when the Big 8 was on the verge of collapse. As an avid Kansas basketball fan, it was important to me that — Kansas played Colorado every season?

Today I realize it should have been obvious the Wings were going to close shop. I'm old enough now to recognize the foolishness of thinking the Big 8 would be around forever.

And yet here I am again, watching closely as the PGA Tour and LIV Golf duke it out. I haven't been through this one before, but I feel like I should know better than to care. It was when Dustin Johnson went to LIV Golf that I felt that old sting again, of the Wings going out of business or maybe more appropriate, of a conference going through a major change. DJ has been a golfer I've enjoyed following over the years and interviewing a few times. Seeing him apparently walk away from the PGA Tour shouldn't have had any effect on me, but it did.

There's no telling how many more 'big names' will join LIV Golf in the next days and weeks. This roller coaster is just picking up speed, it seems. Last month I thought it might become old news soon. Now, I'm worried this story isn't going away for a long, long time.

Money. That's what it's all about. With age, we keep getting reminders that sports teams and leagues are a business with an underbelly. My daughter asked me if I've seen the Netflix series *Bad Sport* yet. I told her I was aware of it, but no thanks — I already know too many of those stories.

Shazam! is coming to a close next door. The premise is lighthearted: a troubled boy can suddenly transform into an adult superhero by uttering a single word. The kids must like the fantasy of being able to instantly become a grown-up. When you're little, you want to be grown-up.

Conversely, I wouldn't want to be young again. I would like to have a magic word that came with a lightning strike, suddenly making sports we enjoy uncomplicated and simply the game itself. All the business, the contracts, the endorsements, we could no longer see. We could watch the sports through the eyes of a young person.

There's a fantasy.

Email Jones at: sjones@northcoastmedia.net.

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NEWS, NOTES AND QUOTES

//GREAT RUN AT DEERE RUN

Alex Stuedemann, CGCS (far left), and Jonathan Graham (middle) check out green speeds at the 2022 John Deere Classic. Graham is the incoming superintendent at TPC Deere Run.

STUEDEMANN SAYS GOODBYE TO JD CLASSIC

Longtime TPC Deere Run superintendent becomes director of agronomy

By Christina Herrick // *Editor*

Alex Stuedemann, CGCS and director of golf course maintenance for TPC Deere Run, is in good spirits. It's the day before the first tee-off of the John Deere Classic's pro-am contest and the weather — for once — is just about ideal.

"We've had a very weird weather pattern over the last few weeks — very hot with some rain, heavy winds and doing that all in amongst tournament prep can be very challenging for our crew," he said. "Fortunately, we had a little front move through on Saturday morning and our tournament prep out here at TPC Deere Run has moved into full charge and it's warm but dry."

Stuedemann took *Golfdom* around for an afternoon ride-along before the tournament kicked off.

This year's tournament is essentially Stuedemann's swan song as he's moving on to become director of TPC agronomy for the PGA Tour in September.

Stuedemann said he's looking forward to helping other superintendents at TPC courses grow into roles as others helped him get to this point in his career. The move also is an opportunity to let Jonathan Graham, a former assistant superintendent and intern of his, have a chance to run the course.

Graham, currently the senior assistant superintendent at TPC San Antonio, was in town for the tournament prep, riding around with Stuedemann to learn the ins and outs of running this PGA Tour stop.

"Hopefully we don't scare him away from coming back," Stuedemann joked to the crew and volunteers before evening maintenance.

Stuedemann is quick to share the credit with his crew of 22 and 38 tournament maintenance volunteers for getting the course and grounds ready.

"Our 22 staff and 38 volunteers are knocking it out of the park and getting the golf course prepared for the first day of competition," he said.

//DAN'S THE MAN

PBI-GORDON WELCOMES DAN DUMLER

PBI-Gordon announces Dan Dumler as its new Western regional sales manager. Dumler is responsible for leading the PBI-Gordon sales team in the Western half of the United States — which includes Wisconsin and states west of the Mississippi River.

Dumler's duties include coaching the Western regional sales team, identifying new sales opportunities and strengthening the company's product portfolio with key customers in the golf course maintenance and professional lawn care segments.

Prior to joining PBI-Gordon, Dumler was a regional sales manager at Simplot Turf and Horticulture. Before that, he held various sales positions for Bayer Environmental Science. Dumler has a bachelor's degree in agricultural business management from Oregon State University.

"Dan brings more than 27 years of turf industry and sales leadership experience to this role with PBI-Gordon," Tim Demerath, vice president of sales for PBI-Gordon Corporation, said. "We are excited to have Dan on board. Our customers and sales team will benefit greatly from his deep knowledge of this industry."

//COME JOIN US

APPLICATIONS FOR *GOLFDOM* SUMMIT OPEN

The Golfdom Summit, one of the most exclusive events in the business of golf, is currently accepting applications.

Now in its 11th year, the event gives superintendents the opportunity to develop and strengthen industry relationships in an upscale-yet-casual environment. One-on-one meetings with suppliers allow superintendents to talk directly with the companies that supply the products they use every day.

The event will be held Nov. 16-18 at Reunion Resort near Orlando. The event is limited to 50 superintendent attendees. To apply visit GolfdomSummit.com.

PHOTO BY: GOLFDOM STAFF; GETTY IMAGES / ISTOCK-GETTY IMAGES PLUS / WELLGLAD (GOLFBALL); ANASTASIA_NEW (HAND)

//INDUSTRY LEADERS WELCOME CHANGE

GCSAA applauds passage of Florida law for golf course BMP program

The Golf Course Superintendents Association of America (GCSAA) commended the signing of Florida H.B. 967 into law by Gov. Ron DeSantis, which recognizes Florida's Golf Course Best Management Practices (BMP) Certification program. The bill, signed on June 20, went into effect on July 1.

"With Governor DeSantis' signature, the new law recognizes the significant role that the golf industry has in Florida, and it also acknowledges the long record of environmental stewardship that Florida golf superintendents have embraced," J. Bryan Unruh, Ph.D., professor at the University of Florida and associate director of the West Florida Research and Education Center, said.

GCSAA said Florida BMPs are one of the earliest success stories of its BMP initiative, which spearheaded the development of golf course BMP guidelines in all 50 states. The Florida Golf Course BMP Certification Program launched in 2012. This voluntary program, now memorialized in state statute, affords BMP-certified golf course superintendents exemption from certain local training and ordinances relating to water and fertilizer use.

The certification program does not exempt superintendents from complying with the rules and requirements for golf courses located in an area within a basin management action plan, a scientifically based program designed to allocate pollution loads to non-point and point sources.

"The passing of Bill 967 is a testament to the dedication superintendents and others in the turf industry have to maintain golf courses through environmental best practices," Rhett Evans, GCSAA CEO, said. "Florida was one of the earliest adopters of state golf course BMPs, so it is not surprising that industry leaders in the state were committed to seeing them recognized by law. We congratulate everyone in Florida for their hard work and success."

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Greg Nickerson
@ganick23
Superintendent
Erie Shores GC,
Madison, Ohio

A little short-handed today, so brought the boy in for cup changing training. #familytime

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//A FIRST TIME FOR EVERYTHING

FAIRWAYS FOUNDATION HOSTS INAUGURAL SUMMIT AT FIRESTONE

More than 80 people attended the inaugural FairWays Foundation summit at Firestone CC in Akron, Ohio. The recent event aimed to raise awareness of the foundation's work. Attendees included industry influencers as well as previous and potential grant recipients.

Matt Foster, FairWays Foundation president, encouraged the group to spread the word about the foundation, particularly its ability to help fund small and large conservation-based projects for those in the industry.

"We understand making a difference in your community takes a tremendous grit from a local champion," he said. "It might be a greenkeeper, park manager or program volunteer. Regardless, without their will, these projects would never move forward. Our message to those individuals out there with the wish of a healthier environment is that the FairWays Foundation can help provide a way to make it happen."

The foundation granted nearly $300,000 in funds to date. The organization said it hopes to see the 2022 cycle raise to $500,000. To learn more visit **TheFairwaysFoundation.com**.

//A FRESH POINT OF VIEW

LANDSCAPES GOLF MANAGEMENT GROWS PORTFOLIO

Lincoln Hills Golf Club in Ludington, Mich., and Scotts Bluff Country Club in Scottsbluff, Neb., selected Landscapes Golf Management (LGM) to provide advisory services. LGM's select disciplines involve golf operations, agronomy, marketing, sales, food and beverage, financial management and accounting and vertical and horizontal construction.

"The behind-the-scenes guidance Landscapes Golf Management affords Lincoln Hills and Scotts Bluff is invaluable," Tom Everett, president of Landscapes Golf Management, said. "It's always productive when fresh, professional, outside perspectives help elevate all the clubs represent to their respective communities."

Lincoln Hills is a semi-private club on the shores of Lake Michigan.

Scotts Bluff Country Club is in the panhandle of Nebraska, three hours to metro Denver and 90 miles to Cheyenne, Wyo. The layout is set amongst mature trees, scenic lakes, sand bunkers and picturesque homes.

Legends Initiative

Shawn Emerson

Consultant

Ethos Club and Leisure, Mooresville, N.C.

By Seth Jones

Started by Anuvia, the Legends Initiative celebrates superintendents who have gone above and beyond in their careers — not just in maintaining tremendous golf courses, but also in their contributions to the industry, creative problem solving and mentorship. *Golfdom* sat down with Anuvia Legend Shawn Emerson, now involved in executive searches with Ethos Club and Leisure, about moving up in the golf maintenance world.

What advice do you have for assistant superintendents looking to break through and land a superintendent position?

If I'm an assistant looking to enhance my career, I would do a couple things: 1) stay relevant by paying attention to what issues are going on, whether that's reading the internet or magazines. And try to narrow your focus. If you like fertility, learn as much as you can. If you're in the southwest, maybe focus on irrigation. Become specific instead of broad. 2) ask your current superintendent if you can go to other courses and meet with other assistants or maybe even other superintendents. Don't just keep doing the day-to-day grind at your own facility.

What do you tell superintendents who are looking to move up in the world? I'm in the recruitment business — the executive search world — now. There are three things that make this decision today. No. 1 is economics, more money. No. 2 is prestige, to go to a higher club. Sometimes the best clubs are not the top name clubs. If you want to learn more, you may need to do it at a mid-level club. No. 3 is the lifestyle. How do you want to live? We're losing too many assistants from age 33 to 40 because they're raising their families. They have kids and little league games to go to. When I left Desert Mountain, I didn't realize how much I was giving up in life. I worked 40 out of 52 Saturdays every year. You have to understand what the reasons are for you leaving. Are you leaving for economics, prestige or a lifestyle? And it can change all the time, it's never a straight line.

There is so much going on in the golf world today, what is the latest hot topic in your mind?

You have to plan way ahead. Irrigation parts, manufacturing, it's all behind. Contractors are scheduling (for 2023) right now and probably looking at '24. You have to be really proactive and look further down the chain. It used to be you could call today to get fertilizer delivered tomorrow. That's not happening now. You have to project what's coming. The best way to project is to write a good plan. You can always change the plan, but really think to the future. Don't just think about today.

//OPEN FOR BUSINESS

NGF: GOLF COURSE CLOSURES DOWN IN 2022

A downward trend in golf course closures continued into 2022, according to the National Golf Foundation (NGF). In the first half of the year, the NGF found less than 50 18-hole equivalents closed.

The NGF identifies closures through an outreach process, in which the foundation then confirms whether or not a course is open for business through email, website reviews, online searches, satellite images and phone calls. Through June, the NGF estimates half of the country's 16,000-plus golf courses have been verified.

Through its research, the NGF found that more than 90 percent of closures are daily-fee public courses where over half of the closures were nine-hole courses and 75 percent had a peak greens fee under $40.

"While the total number of 2022 closures is subject to change based on the results of second-half verifications, we currently project it at 95 18-hole equivalents. That would represent a 66 percent drop from the peak in closures that occurred in 2019," said Joseph Beditz, president and CEO of the NGF.

To read the NGF's full report, visit **NGF.org/Mid-Year-Update-Golf-Course-Closures/**.

GO FIGURE

$4,000,000

Amount Branden Grace of South Africa earned after winning the LIV Golf Invitational Portland at Pumpkin Ridge

$1,455,000

Amount Cam Smith of Australia earned after winning the Open Championship at the Old Course at St. Andrews

Source: CBSSports.com, LIVGolf.com

"Admittedly, a lot of things can make us question what something is, even something we have seen before, as there are so many variables in what we do, so I understand looking for the easy answer."

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

The easy way isn't always the best way in turf issue diagnosis

Every month as the trade publications come in, there is one page that I always jump to — right after I'm done reading the latest issue of *Golfdom* from cover to cover, *obviously*.

It's the Mascaro quiz in *Golf Course Management*. I love the sometimes-obvious issues, the totally obscure (I'll admit the asteroid one got me) or the just plain interesting ones (I learned something today).

I might be a bit liberal in my rating of my answers, but I'm proud of my 95 percent success rate. I technically got the asteroid one correct as I knew something like a rock struck the surface. I quickly got the two 10-foot parallel lines on fine turf (helicopter on a green).

Maybe it's because I have been around for a while, like the Farmers Insurance commercial "we know a thing or two because we've seen a thing or two," or it simply means I've been (un)fortunate to be around a lot of potential disasters.

Crowdsourcing

This makes me curious about how others do on the quiz, especially when I see problems posted on social media. I'm often curious what someone expects when they post a picture or two of an issue with some limited text and open it up to the interwebs experts.

Of course, being one of those experts, coupled with my ridiculously inquisitive nature that loves trying to solve a problem, I take a look. Usually, I come up with a quick solution and am satisfied that I'm right, and I move on, as there is no way to check the correct answer.

But occasionally, when I have time, I'll bite and ask for some more info. Sometimes I get more information, sometimes not, which is very upsetting as I get absolutely no closure for my minimal effort. The one thing I really wonder is if someone thinks, "oh, here's a problem, I have no idea, so I'll just post it online and see what the consensus is," without making any effort to solve it themselves.

Admittedly, a lot of things can make us question what something is, even something we have seen before, as there are so many variables in what we do, so I understand looking for the easy answer.

More harm than good

What motivated this column was a simple picture of some dead turf at the edge of a green along with some text about bentgrass coming out of dormancy. The temps were cool and "it wasn't moisture-related as there had been a lot of rain recently."

The answers ranged from winter kill and damage to root rot, wilt (including reasons for wilt) and desiccation. Based on the evidence given, none of those were necessarily wrong, but where does the poster start now? There are 1,000 answers; none are wrong without pertinent information. Without all the correct information, formulating a solution based on what could essentially be a wild guess can do more damage than good.

A picture tells a thousand words but not the whole story. In-person, you have even more data available. Although, we need to know what it is telling us to make proper use of the data.

In this case, there were fertilizer streaks on the turf. Mr. Farmers here knows a thing or two about that, having recently tried using a topdresser to spread old fertilizer and streaking the rough on a hill. At least it was facing the clubhouse so everyone could see it. And I now know topdressers don't make good fertilizer spreaders, which, incidentally, I added to my arsenal for the next quiz.

But I digress. The dead spot looked to be in a low area, so if it wasn't there when the snow melted, then it is probably fertilizer burn from the excessive rain washing it to the low spot. Since I got no more information on this one, I'll never know if I was right. So, I'm counting it as a pass.

The easy way isn't always the best way. Work backward from the problem, pay attention to all the details and the answer will usually come.

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

A Supplement to

Golfdom

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Beyond brochures

What to consider when selecting lithium-ion batteries

BY BETTY SOSNIN

All lithium-ion battery manufacturers claim the products are reliable, long-lasting and safe. In truth, there can be major differences in the quality of these products. These differences depend on the expertise of the manufacturer, the build quality of the battery and the availability of support services.

A young technology

Before selecting lithium-ion batteries, it's important to understand the current state of the industry. Lithium-ion is a relatively new technology that's taken off in the last five to 10 years. The demand for these batteries is high and continues to grow.

As a result, many startups have jumped into the arena. They may lack the engineering expertise and infrastructure needed to manufacture and service the quality products golf courses need.

"Startups generally face stiff learning curves," says Eric Lehmann, director of quality services for Trojan Battery Co. "Further, inflation and supply chain problems are hitting startups especially hard right now. That makes it important to do your due diligence, not only on the batteries but on the manufacturers themselves."

Durability is in the details

The better the build of a battery, the greater the return on investment will be.

"First-rate manufacturers design and engineer their batteries to preempt common problems. As a result, these batteries often deliver superior performance and longer life," Lehmann says.

Ask the manufacturer how they design batteries to handle:

- **Vibrations.** Superintendents are well aware of the rigors golfers put golf carts through. Golfers may drive vehicles on rocky paths, over curbs and into sudden stops, which can damage or destroy the electronics in lithium-ion batteries. Most batteries will claim to be vibration resistant, but standards vary considerably.

For optimum durability, look for batteries rated to the Society of Automotive Engineers (SAE) standard SAE J3060 — the benchmark for batteries used in agricultural and construction environments. It protects the battery's wires and components and increases its life. Many batteries do not meet this high standard.

- **Dust and water ingress.** Dust, rain, snow and sand can also damage batteries. Look for a battery with an ingression progress rating of at least IP67. Batteries not certified to this standard are vulnerable to costly environmental damage.
- **Heat dissipation.** Lithium-ion batteries can generate high heat. Manufacturers must move this heat away from the battery's cells to prevent damage. Most manufacturers do this through inexpensive components called heat sinks because they are easy to make and add on. But if the battery generates high amounts of heat, the cells inside will likely age faster.

Heat sinks should not be the only method of heat management.

"Well-designed batteries reduce the heat generated and allow for natural cooling in the design. This requires more engineering expertise, but it boosts efficiency, improves safety and prolongs battery life," Lehmann says.

Ease of use and safety

- **Make sure the batteries are fully drop-in and scalable.** This allows crews to replace the batteries in existing cars with lithium-ion batteries and add batteries when needed to extend range.
- **Consider the range.** The range

Durability matters when searching for a lithium-ion battery. Ask manufacturers how the batteries handle vibrations, dust, water ingress and heat dissipation.

PHOTO BY: TROJAN BATTERY CO.

of lithium-ion batteries varies considerably from manufacturer to manufacturer. Make sure the batteries provide the longest range possible. Real-world test data and testimonials are the best way to understand the available range of a battery. Manufacturers may base stated capacity on the sum of individual cells within the battery, which is different from usable capacity and does not account for internal losses. Check usable capacity.

- **Ask about UL certifications.** Is the entire pack UL-certified or does the manufacturer rely solely on the cell provider's UL listing?
- **Look for a battery with lithium-iron-phosphate cells,** one of the most stable lithium-ion battery chemistries.

Check the Battery Management System (BMS)

Traditional lead-acid batteries require users to gather information through inefficient shunting or voltage monitoring. But lithium-ion batteries feature smart BMS that function as the battery's brain. They allow the components to communicate with each other to protect the battery from damage, prolong its life and keep it operating within its safety limits.

These systems are not equally effective. To identify a sophisticated, high-performing system, Lehmann suggests you:

- Look for a BMS with several levels

Continued on page BP6

Continued from page BP5

of safety redundancy. "That way, if one level fails, another will step in, catch the issue, and turn the battery off, protecting you and your property," he says.

- Find a BMS that pairs the battery with an in-cab battery charge indicator. This will tell the crew the state of charge for each car, prevent stranding golfers and speed the pace of play.
- Get a battery that can communicate with chargers and/or the vehicle itself via a controller area network. This level of communication maximizes the advantage of the BMS and the efficiency of a lithium-ion battery.

Chose a partner, not just a supplier

Lehmann suggests beginning a search for batteries by looking for an experienced manufacturer who has supplied batteries to major golf car OEMs.

"These companies won't be playing catch up. They know the problems golf courses face and the issues that can damage batteries and shorten their lifespans," Lehmann says.

Ask the manufacturers these questions:

- "How long have you been making batteries for the golf industry?" Knowledge of the golf industry and the golf cart's use is a must.
- "How long have you been working with lithium-ion technology?" If the answer is just a year or two, the company probably has a lot to learn.
- "What kind of customer support do you provide?" Make sure the company has a customer service line staffed by real people who can answer questions and help technicians troubleshoot issues. Ask if support is available 24 hours a day and if the staff includes representatives dedicated to lithium-ion products. Many newcomers to the market simply don't have the infrastructure to provide this level of service.
- "How do you sell your batteries?" Look for a company with an extensive distributor network that sells its products locally. Make sure distributors understand how to operate and troubleshoot the company's batteries.

With due diligence, superintendents can avoid buyer's remorse and properly identify high-performing, long-lasting batteries.

Betty Sosnin is a freelance writer based in Augusta, Ga.

A strong partnership with a battery manufacturer is crucial, according to Eric Lehmann, director of quality services for Trojan Battery Co.

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QUALI-PRO

TRUST THE RESEARCH FOR AN ABW-FREE COURSE

Superintendents share why they rely on Suprado to tackle even the most difficult annual bluegrass weevil problems

For many golf course superintendents, annual bluegrass weevil (ABW) presents an interesting challenge. As ABW larvae feed on annual bluegrass, large areas of turf turn yellow and die, which is an eyesore on greens and fairways.

The team at Quali-Pro recognized the challenges superintendents faced and jumped into action, creating Suprado Insecticide, powered by active ingredient Novaluron. Novaluron works as a chitin synthesis inhibitor, interfering with the insect's ability to create chitin, an important part of the exoskeleton, and causing abortive molting, killing the larvae.

Superintendents Chris Navin, Nick Baskette and Glen MacDonald all battle annual bluegrass weevil on their courses. Thanks to Quali-Pro and Suprado, all three superintendents say they now have healthier courses and happier members.

THE PROOF IS IN THE TEST PLOTS

Originally a teacher, Navin started his career in the golf course industry in 2000 at courses during summer breaks. In 2012, Navin officially left teaching and worked full-time in the industry while attending the Rutgers Professional Golf Turf Management program. After graduation, he took a job as assistant superintendent at Bulle Rock Golf Course in Havre De Grace, Md. Navin left Bulle Rock at the end of 2015 and became superintendent at The Club at P.B. Dye in Ijamsville, Md., where he is in his seventh season.

Since opening in 1999, The Club at P.B. Dye has had a reputation for difficult greens, rolling hills

PHOTO: CHRIS NAVIN, THE CLUB AT PB DYE

QUALI-PRO®

and beautiful views. Ownership committed to restoring and renovating the golf course as Navin started. This included developing an ABW management program. Navin battled the pest for the next six years with mixed results.

Chris Navin

"After first hearing about Suprado during the 2021 season, I started doing some research on the product and was impressed with the initial observations and data, enough so that I felt it would be a very beneficial product to purchase for our 31 acres of fairways," Navin explains. "At a few of the seminars I attended during the fall and winter months, the discussion over this product was very exciting and left me with a pretty good handle on how and when this product would work best."

Navin started using Suprado this spring on his 31 acres of bentgrass and *poa* fairways. He decided to leave a test plot in an area that historically has seen heavy ABW infestation. He was able to compare the efficacy of the product from the test plot to the rest of the treated fairways.

"After the application, we had a check plot area in one of our worst areas on the course when it comes to ABW populations and damage," says Navin. "When we first started seeing damage to turf in this area, we continued to scout the rest of the property for any other ABW damage. After about 10 days, this was the only damage on the entire 31 acres of fairways. We pulled plug samples from our other known hot spot areas for ABW populations and found zero larvae or pupa in these areas. We then returned to the damaged turf and found several larvae and pupae in each plug taken from that area, but as soon as we moved to treated turf a few feet away, populations dropped to zero."

Following the drop in ABW population, Navin says members and guests noticed the changes, mentioning the course is in fantastic shape, even following a few particularly dry months this summer.

"In the past, we noticed that after stretches of dry weather with the peak sun angle of May and June, areas of *Poa annua* would begin to show signs of stress due to ABW damage combined with current weather conditions," explains Navin. "The difference has been amazing."

For fellow superintendents, Navin has a word of advice — do your homework.

"Do your research to better understand the product and how it works," he says. "If there are any concerns, listen to the anecdotal and testimonial evidence that will be available as the summer progresses. From what I have heard as of July 1, there isn't much — if any — disappointment, and many are very impressed with the efficacy, including myself."

BREAKING THE MOLD FOR ABW CONTROL

Holly Hills Country Club (HHCC) in Ijamsville, Md., was founded in 1977 and designed by Russell Roberts. The course features bentgrass and annual bluegrass greens and bentgrass, ryegrass and annual bluegrass tees and fairways. HHCC hired Nick Baskette as

PHOTO: CHRIS NAVIN, THE CLUB AT PB DYE

superintendent in the fall of 2012, having spent 23 years in the golf course industry.

Over the years at HHCC, Baskette performs the same scouting routine to try to get ahead of the ABW population plaguing the course. Thanks to Suprado, Baskette says the course's ABW population diminished drastically.

"When I arrived at HHCC almost 10 years ago, we were seeing huge numbers of (ABW) adults when scouting using a vacuum in early spring. Later, salt flushes on fairway plugs would sometimes see a dozen or more larvae per sample area," Baskette explains. "Over the years, our control strategy evolved, and we have achieved much better control. This year, scouting for larvae post-Suprado (application), we have only identified one early instar larvae in multiple fairway samples."

The crew at HHCC uses Suprado across all 26 acres of fairways, four acres of greens and three acres of tees. Baskette said the team is pleased with how well the product works.

"Initial reactions from the techs to Suprado have been entirely favorable, the techs are pleased with Suprado both from an ease of use/handling perspective and a pest control perspective," says Baskette. "Last year, when I attended several educational seminars focused on Suprado, I was a bit skeptical of a product claiming near 100 percent control of any golf course pest, but my observed control of ABWs to this point has been exceptional. Our members and players have noted an increase in turf quality during 2022 compared to previous years."

Shannon Slevin, mid-Atlantic territory manager for Quali-Pro, worked closely with the team at HHCC during the initial product rollout to give Baskette's club the best results possible. Slevin even worked with the team at HHCC to devise a strategy to best apply Suprado with different water volumes and timings of post-application irrigation, giving Baskette a hand up over ABWs.

Nick Baskette

Baskette's advice to supers considering adding Suprado is simple: "Introduce it into your spray program on a limited acreage area such as tees and evaluate control there to see if it would be a good fit into your overall ABW management strategy. Basically, just give it a try."

SIMPLIFY THE SEASON WITH SUPRADO

When Glen MacDonald began at Cripple Creek Golf and Country Club in Dagsboro, Del., as superintendent 17 years ago, he brought along an illustrious career in the industry, having worked in more than four states to acquire his wealth of knowledge. For years, Cripple Creek suffered annual bluegrass weevil damage to fairways and greens, causing the technicians to stress and the members to notice the large dead patches of grass across the otherwise beautiful course. When MacDonald approached his Quali-Pro rep with this problem, there was a sure-fire solution: Suprado.

"I've done two applications of Suprado this year, and I'm very pleased," MacDonald says. "We had a lot of resistance, like a lot of guys are having with other insecticides, and within the first application saw great results. If you use it right after peak adult migration, you're going to maximize your control."

As the team at Cripple Creek began using Suprado across the fairways, MacDonald and his crew noticed how quickly Suprado worked and how quickly the team got the pest under control. This allowed the techs, MacDonald and the members to rest a little easier.

"It's amazing how such little insects can be catastrophic in a sense," explains MacDonald. "In years past, I would video tape the ABWs moving to show my members what was causing the damage. This year I won't be able to make that video after using

SUPRADO

Suprado. It's been a game changer for us."

Even though MacDonald is in his first year working with Suprado, he says he has already seen great improvements on the course and anticipates club members will highly regard this product change.


Glen MacDonald

"I'll take our members out every once in a while so they can see the soap flush to better understand what we are going through," MacDonald says. "This is our first year using Suprado but it's going to become a staple, right now, there is no resistance to it. I'm excited to see what the members notice when there isn't any ABW damage to the course."

MacDonald knows that it isn't just the members who will notice a difference. He said his technicians told him how pleased they are not only with the results they're getting but also with the ease of use. With how safe Suprado is to apply, MacDonald said PPE and respirators are not necessary, which allows the technicians to apply the product and continue working on the course. This, according to MacDonald, has made it very easy to deploy the product where needed throughout the fairways.

> **"In years past, I would video tape the ABWs moving to show my members what was causing the damage. This year I won't be able to make that video after using Suprado, it's been a game changer for us."**
>
> *– Glen MacDonald*

As the season at Cripple Creek progresses with little to no ABW damage, MacDonald has one main piece of advice for other superintendents looking to use Suprado and other Quali-Pro products: trust the research.

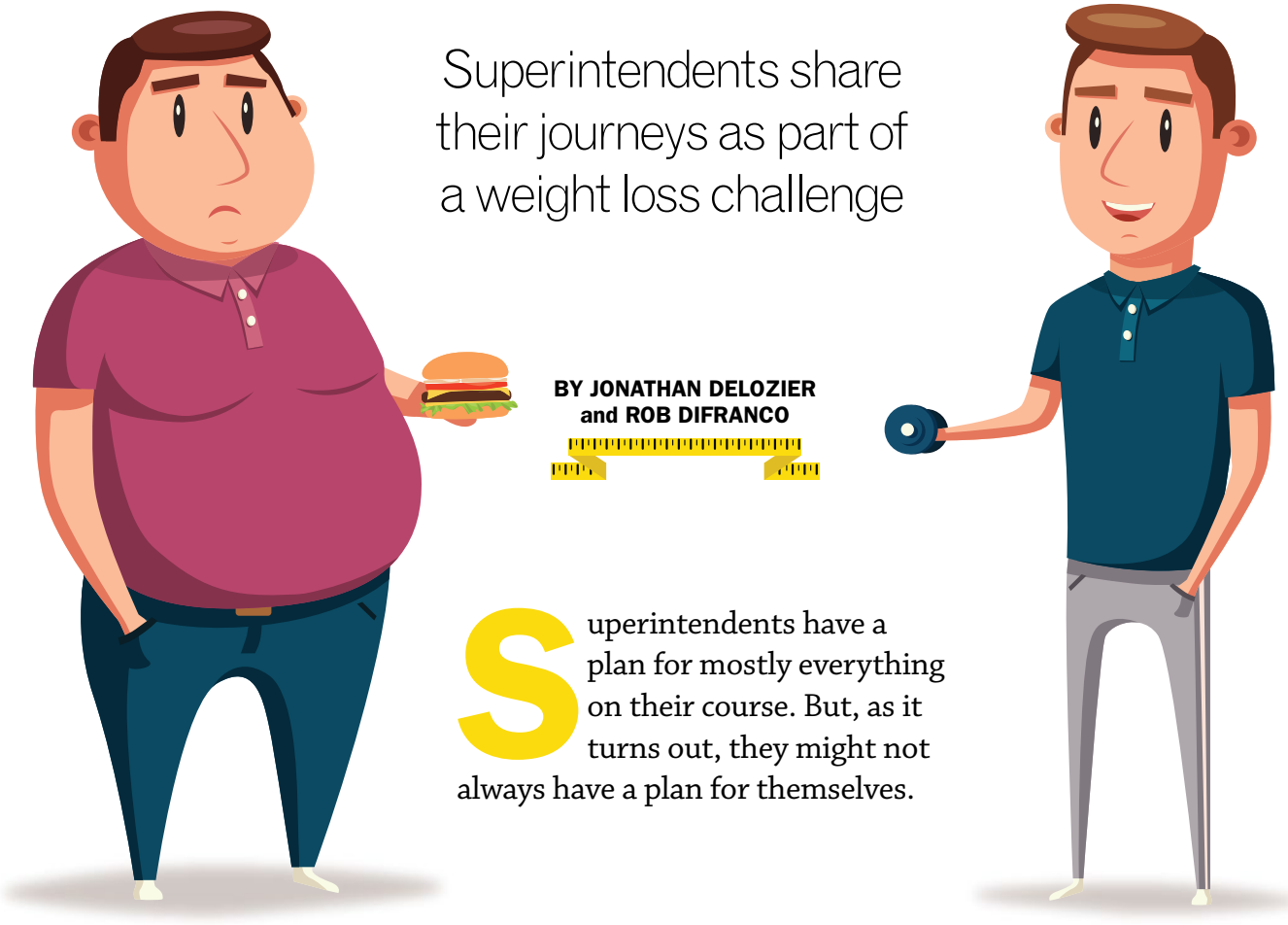
"Penn State, Rutgers and other great universities have done the research to vouch for the product," MacDonald says. "That's always one of the first things I look at with products — does it work, where was the research done and who is using it. Quali-Pro has done a great job providing the research so we have it. With all the data available, it's a no-brainer for the end user."

Interested in trying Suprado for your course? Visit ***Suprado.com*** *for more information.*

PHOTO: CHRIS NAVIN, THE CLUB AT PB DYE

With a little help from my friends

Superintendents share their journeys as part of a weight loss challenge



BY JONATHAN DELOZIER and ROB DIFRANCO

Superintendents have a plan for mostly everything on their course. But, as it turns out, they might not always have a plan for themselves.

"We're the most regimented people when it comes to growing things and watching what we put on the greens and the turf and in the soil; we calculate everything. But when it comes to our bodies, we kind of just go dumb. It's borderline comical," Kyle Callahan, director of golf course and grounds for Thornblade Club in Greer, S.C., says.

Callahan and Tony Nysse, director of golf course and grounds for Mountain Lake in Lake Wales, Fla., started a weight loss challenge as a friendly competition between themselves and a handful of friends in the industry.

Word of mouth allowed the scope of the challenge and its number of participants to grow significantly across its seven-month span. The first eight-week challenge brought together over 140 agronomists and industry professionals, competing for not only money but the chance to transform their lives.

Below are the stories of four industry professionals who participated. They share tips for shedding pounds and keeping them off while handling the stress of their jobs.

Tom Kaplun

SUPERINTENDENT, North Hempstead Country Club, Bellmore, N.Y.

Health blind spots can pop up in the typical day-to-day life of golf professionals, says Tom Kaplun, superinten-

Continued on page 24

DMITRYMO / ISTOCK-GETTY IMAGES PLUS / GETTY IMAGES

Tom Kaplun shows off the before and after photos from the superintendents' weight loss challenge.

"I look forward to it now. It's been such a great life change, just thinking back to getting this whole thing started last year and this (weight loss contest) coming up," he says. "I saw it and said, 'Yes, I want to do that,' right away."

In regard to advice for fellow industry professionals considering new fitness initiatives, Kaplun said to never minimize the overlap of physical and mental health.

"The most important thing you have to do on this job is maintain a mental awareness of yourself and how you're doing personally," he says. "This is a tough, demanding job. It's just as tough mentally as it is physically. If you don't hold onto a certain mental wellness with yourself and put yourself first sometimes, this job and this industry can really take a toll on you. That goes for at work and outside of work."

— *J.D.*

Continued from page 23

dent at North Hempstead Country Club in Flower Hill, N.Y.

He said this year's weight loss challenge came at the perfect time for him, just a few months after starting his own fitness initiative. The 42-year-old Kaplun, a former football player at Cornell University, dropped from 298 to 243 pounds since New Year's Day and doesn't plan to stop there.

"I came to a point where, as a father of three kids trying to balance work, the needs of my crew and family life, it made me realize I needed to make healthier choices to sustain that life and my career," he says. "The contest was great ammo for me and helped me stay disciplined. I'd let my weight tail off, and around Thanksgiving last year, I really started to prioritize that."

While Kaplun didn't take home any winnings from the weight loss contest, he did place second in a local eight-week body mass index transformation competition. He also took part in a recent half-marathon and maintains a busy workout regimen following Orangetheory Fitness guidelines of a 60-minute high-intensity workout based on heart rate.

"The most important thing you have to do in this job is maintain a mental awareness of yourself and how you're doing personally. This is a tough, demanding job."

— Tom Kaplun, superintendent,
North Hempstead Country Club, Bellmore, N.Y.

Kyle Callahan

DIRECTOR of GOLF COURSE and GROUNDS, Thornblade Club, Greer, S.C.

Callahan lost 50 pounds during the first eight-week run of the challenge. He says it wouldn't have been possible without the help of his crew, who understood his goals and supported him.

"I worked with my team, and they knew what my goals were, and they supported it," he says of his weight loss strategy. "I scheduled a couple of training sessions during my lunchtime so that I could try to squeeze it in. I altered parts of my schedule, especially because it was that early spring and winter when that's easier to do."

Callahan says he prefers to work out in the morning, which isn't easy to do in the summer when work starts as early as 5 a.m. on the course. The initial eight-week challenge took place during the transition from winter to spring, which made it easier for him to get to the gym on his terms.

His biggest change was eating healthy

PHOTOS BY: TOM KAPLUN;

at work. He says the biggest reason people put on weight and can't take it off is that they put themselves last.

"It's hard to be able to say; I'm going to quit watering greens because now is my time to fuel my body. So, what do we do? We push it off, we get done with our priorities and then it's like, oh yeah," he says. "That's what makes it so hard. It can become very difficult to put yourself first, mentally and physically."

— R.D.

Joe Wachter

SUPERINTENDENT, Glen Echo Country Club, Normandy, Mo.

Joe Wachter, superintendent at Glen Echo Country Club in Normandy, Mo., joined the weight loss challenge as a way to get back into shape after COVID-19 knocked him out of his normal routine. He didn't think he could lose enough to win any money, but he was, at the very least, donating to the weight loss cause and doing something good for himself.

PHOTOS BY: JOE WACHTER

▲ Joe Wachter, superintendent at Glen Echo Country Club in Normandy, Mo., started running marathons at the age of 64, which he says helped him stay in shape.

Like Callahan, Wachter says that even though he stays active on the course while

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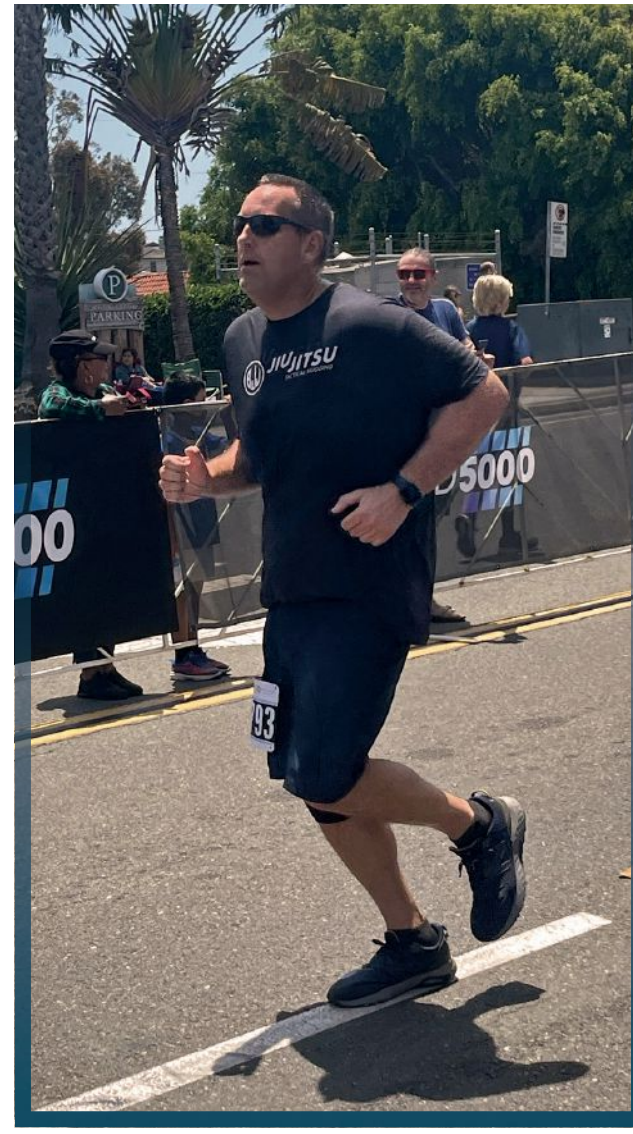
he works, it is not a substitute for exercise.

"I'm in a small enough course where I have daily duties," he says. "I'm either changing holes or riding a mower. Every once in a while, I can pick and choose. So I had some activity level, but it's still not exercising. It keeps your joints going, but it's not the exercise you really need when your eating isn't the best."

Wachter started walking as a way to exercise. He says he walked 40 or so minutes around his neighborhood. Those short walks turned into long walks and, eventually, runs.



▲ Ken Newcomb credits the weight loss challenge for helping him cap off a successful year-long process of slimming down.

PHOTO BY: KEN NEWCOMB

"I decided to run a marathon in April. I said, 'man, I've always thought about doing it.' Well, to run a marathon, I had to do a 15-minute mile," he says. "Those aren't necessarily easy for me. I can push really hard and learn to maybe get to (15-minute mile pace), but I didn't know if I could get to the point of running over 26 miles at that pace."

Wachter trained for and ran in his first marathon, the 2022 Go! St. Louis Marathon in nearby St. Louis, Mo. Wachter clocked a 14-minute per mile pace.

"I think the one thing that I've found is that I'm not doing this to see if I win or not, but just to challenge myself and keep my effort going so that I don't drop off," he says of distance running.

— R.D.

Ken Newcomb

OPERATIONS and SALES MANAGER, Underhill International

Ken Newcomb, operations and sales manager for Underhill International, says the weight loss challenge helped him drop nearly 100 pounds since last year.

"I was super overweight and got started on it about a year before (the contest)," he says. "That turned into me losing about 80 pounds, and by the time the contest got started, I was down to my last 30 or so (to lose). I don't remember off the top of my head what I lost for the contest, but it's been about 15 (pounds). The giant steps were already done, though."

Among participants in the contest's first round that started in January, Newcomb said practices like weekly check-ins and holding each other accountable proved invaluable to his weight loss transformation.

"People were just overjoyed to have someone to talk to and share something that maybe they were struggling with that day," he says. "It created this real team atmosphere you could feel during every conversation."

During the weight loss contest, Newcomb realized the mental health benefits that came with the weight loss challenge.

"I'm not a superintendent anymore, and a lot of meetings took place during superintendent hours," he says. "I didn't get to participate in those, but I know those guys were just very happy to have that outlet to talk to each other."

Newcomb served as a superintendent in Simi Valley, Calif., for American Golf Corporation from 2000 to 2006. That led to stints as regional director for ClubCorp in Arizona and vice president of California's Par West Turf Services before signing on with Underhill International in June 2021.

He says the contest's virtual chats among superintendents brought back memories from his years at the golf course but also a sense of comfort, knowing those following in his footsteps have expanded options for support.

"I know those weekly Zoom (meetings) opened up from just losing weight to overall health, mental health, mindfulness, you name it," Newcomb says. "I know guys talked about stuff that, after all these years, showed me they're under a lot of the same stresses I used to have. It helped a lot of people."

— J.D.

To read more success stories from this weight loss challenge, visit **Golfdom.com**.

Hosted by Mike Kenna, Ph.D. | *mpkenna@gmail.com*

Super Science

// NOT ALL ABOUT THE GREEN

WHY YOU SHOULD FERTILIZE FOR TURF HEALTH, NOT COLOR

By Brian Whitlark

The overarching goal for putting green management is to optimize playing conditions while maintaining healthy turf that recovers well from traffic and ball marks. It can be easy to overdo it when it comes to nitrogen inputs because golfers enjoy the turf's greening response. However, supplying nitrogen in excess of what produces a healthy sward will cause additional growth, leading to maintenance and playability issues.

Here are a few negative consequences of applying too much nitrogen to putting greens:

- Unnecessary growth
- Elevated organic matter and thatch levels
- Difficulty achieving desired green speed and firmness
- Increased labor required for cultural practices such as mowing, vertical mowing and sand topdressing
- Increased evaporative demand
- Increased disease susceptibility
- Higher fertilizer budget
- Less chance to optimize the quality of the playing surface

A bit of fertilizer trickled into the perimeter of this bermudagrass green, showing the impact that excess nitrogen can have on color. Don't let the greening effect tempt you into using more nitrogen than needed.

On the other hand, applying just enough nitrogen to produce healthy turf will limit undesirable growth and organic matter accumulation. This approach is more environmentally friendly, requires less labor inputs and delivers better and more consistent playing conditions. The greens may not be as green, but most players will appreciate the excellent playing conditions day in and day out.

The bottom line is don't fertilize to enhance green color. Supply just enough nitrogen to produce and maintain healthy turf with good recuperative ability.

Brian Whitlark is a USGA Green Section senior consulting agronomist in the West. You can contact Brian at bwhitlark@usga.org for more information.

Reference

Adapted from: Whitlark, Brian. 2022. Fertilize for Turf Health, Not Color. USGA Green Section Record. July 60(12).

USGA'S COURSE CONSULTING SERVICE

Through the work of its Green Section, the USGA focuses on golf course turfgrass, its playing condition and management. Since 1953, USGA's on-site course consulting service helps golf courses nationwide meet the diverse needs of golf course owners and managers. For more information about the USGA's course consulting service, go to: **https://gsshop.usga.org/pages/courseconsultingsolution**.

USGA

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

NEWS UPDATES

PROFILE PRODUCTS ADDS GOLF MARKET DEVELOPMENT MANAGER

Profile Products recently hired Justin Olmstead as its market development manager for its golf division.

Justin Olmstead

"We are excited to have Justin join the Profile team," said Profile Products' Global Director of Golf John Maeder. "He brings over 20 years of experience and relationships in the golf industry. He will be working with the other members of our Profile Golf team to create growth and awareness of how our products can bring a new level of performance and sustainability to professional turf managers."

Olmstead has a bachelor's degree in crop and soil sciences from Michigan State University.

He began his career as an assistant superintendent at Milwaukee Country Club, River Hills, Wis., and later a superintendent at Glen Flora Country Club, Waukegan, Ill.

In recent years, Olmstead moved to sales and service as the turf product manager at Precision Laboratories and a turf specialist with Conserv FS.

"I'm excited to learn and grow in this new role with Profile Products," Olmstead said.

"REGARDLESS OF THE IRRIGATION SYSTEM, THE TURF QUALITY OF SEA SPRAY WAS ALWAYS BETTER FOR THE HIGHER FERTILIZATION RATES."

Matteo Serena, Ph.D.

(see story on page 29)

PHOTO BY: BRIAN WHITLARK, USGA

//WORTH ONE'S SALT

Fertilization needs of warm-season turfgrass irrigated with saline water

By Matteo Serena, Ph.D.; Bernd Leinauer, Ph.D.; Rossana Sallenave, Ph.D., and Marco Schiavon, Ph.D.

Irrigating turfgrass with potable water has become a contentious topic in the desert Southwest of the United States, as freshwater supplies are dwindling and municipalities restrict or eliminate the use of high-quality drinking water for non-essential purposes, such as landscape irrigation. For this reason, researchers propose and investigate several water conservation strategies for use in turfgrass areas (12).

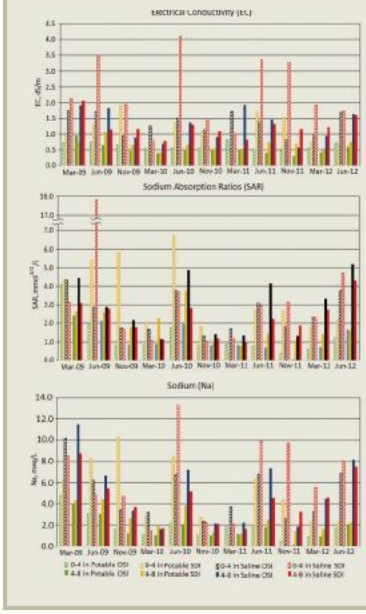
Non-potable water, such as treated effluent or saline groundwater, provides an alternative to using high-quality water for irrigation and is a potential solution to the growing shortage of potable irrigation water. However, saline groundwater and treated effluent contain a higher concentration of dissolved salts, which can negatively affect grass growth, turf quality and soil structure (4,14).

A second approach is to use irrigation systems considered more efficient than traditional overhead sprinkler irrigation (OSI) systems. Although OSI systems are the most commonly used irrigation systems for landscapes and golf courses, these systems can be inefficient because of losses such as overspray, run-off, wind drift and evaporation.

Subsurface drip irrigation (SDI) systems, on the other hand, apply water directly to the root zone, thereby avoiding the problems mentioned above (11). Many recommend such systems for use on residential lawns (23) and golf courses (9). However, few studies have examined whether or not it is possible to apply standard establishment and maintenance practices on SDI-irrigated turf.

Superintendents can establish both warm- and cool-season turfgrasses from seed and sod using SDI. On the other hand, SDI resulted in increased salt concentration in the root zone compared to irrigation with OSI using saline water (6,20,21,22,24,25).

FIGURE 1



Electrical conductivity (EC, dS/m), sodium adsorption ratio (SAR, mmol1/2/L) and sodium content (Na, meq/L) from March 2009 to June 2012 at two root zone depths (0 to 10 and 10 to 20 cm) of turf irrigated with either potable (0.6 dS/m) or saline (3.1 dS/m) water from either overhead sprinkler irrigation (OSI) or a subsurface drip irrigation (SDI) system.

TABLE 1

Main chemical constituents of potable and saline water used in the study.

	Water quality	
	Potable	Saline
Electrical conductivity (dS/m)	0.6	3.1
pH	7.6	7.8
Carbonate (mmolc/L)	n.d.	n.d.
Bicarbonate (mmolc/L)	2.2	3.52
Phosphorous (mmolc/L)	0	0
Potassium (mmolc/L)	0.1	0.5
Magnesium (mmolc/L)	0.8	2.6
Calcium (mmolc/L)	2.6	8.0
Phosphorous (mmolc/L)	0	0
Potassium (mmolc/L)	0.1	0.5

n.d., not detected

Few studies have examined whether or not it is possible to apply standard establishment and maintenance practices on SDI-irrigated turf.

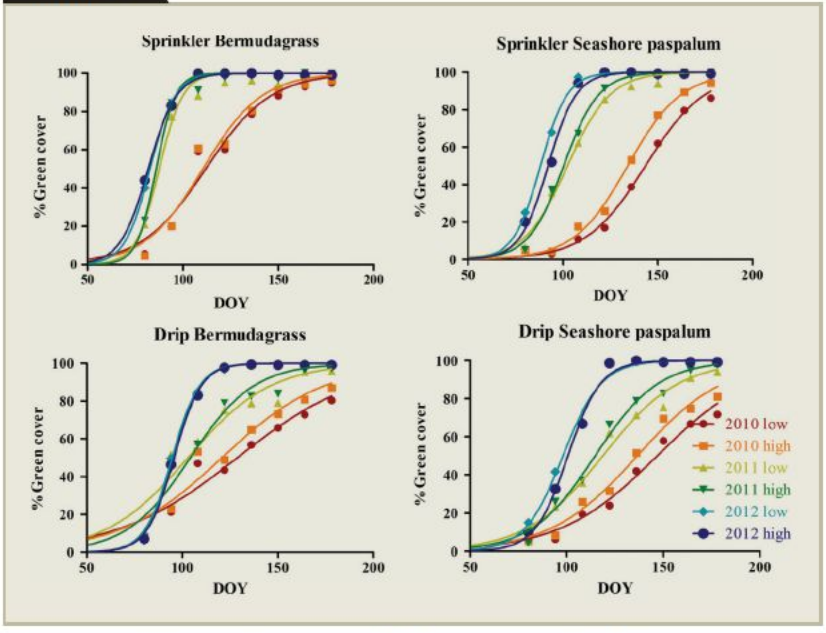
RESEARCHING WARM-SEASON GRASSES

More salt-tolerant than most cool-season grasses, warm-season grasses such as bermudagrass (*Cynodon dactylon*), zoysiagrass (*Zoysia* spp.) and seashore paspalum (*Paspalum vaginatum*) are the logical choice for turf areas where tolerance to saline water is necessary due to potable water restrictions (10).

A dormancy period often follows the growing season of warm-season grasses, extending from the first frost until spring soil temperatures reach 50 degrees F or higher (26). During the dormancy period, the grasses are tan or brown and cannot recover from traffic or other injuries (3).

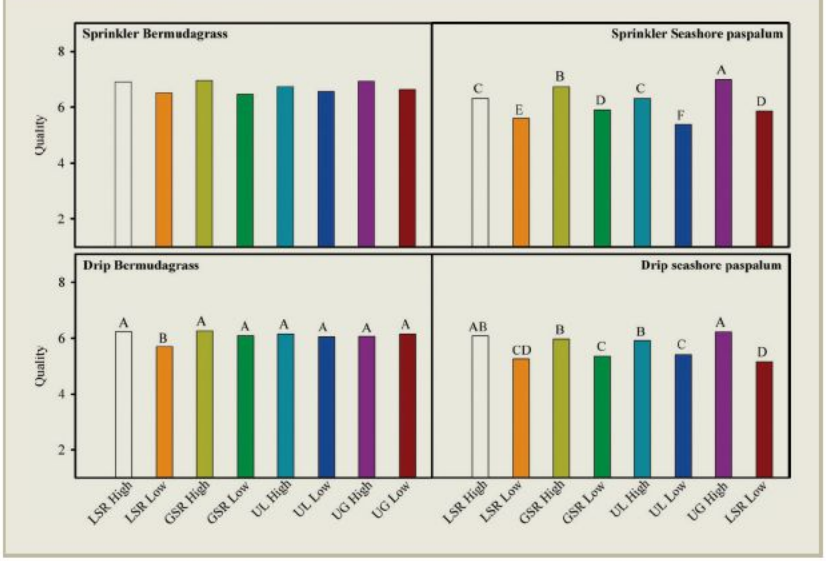
Continued on page 30

FIGURE 2



Turfgrass spring green-up (days of year [DOY] to reach percent of green cover) as affected by year and nitrogen rate (Princess 77 bermudagrass [low = 4 lbs. N 1,000 ft^{-2} $year^{-1}$; high = 6 lbs. N 1,000 ft^{-2} $year^{-1}$]; Sea Spray seashore paspalum [low = 2 lbs. N 1,000 ft^{-2} $year^{-1}$; high = 4 lbs. N 1,000 ft^{-2} year-1]). Each sigmoidal data line represents an average of two water qualities (potable [0.6 dS/m] and saline [3.1 dS/m]), four fertilizers (liquid slow-release, granular slow-release, granular urea, and liquid urea) and three replications.

FIGURE 3



Turfgrass quality rating differences (1 = worst; 9 = best) as affected by four fertilizers (LSR, liquid slow-release; GSL, granular slow-release; UG, urea granular; UL, urea liquid) and nitrogen (bermudagrass [low = 4 lbs. N 1,000 ft^{-2} $year^{-1}$; high = 6 lbs. N 1,000 ft^{-2} $year^{-1}$]; seashore paspalum [low = 2 lbs. N 1,000 ft^{-2} $year^{-1}$; high = 4 lbs. N 1,000 ft^{-2} year-1]). Each data point represents an average of nine seasons, two water qualities (potable [0.6 dS/m] and saline [3.1 dS/m]), and three replications. Bars followed by the same letter (Fisher's protected LSD at $\alpha = 0.05$) are not significantly different from one another (separately for each grass irrigation system).

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In addition, warm-season grasses are susceptible to winter injury in colder climates or delayed spring green-up (18). Species and variety selection can help shorten the dormancy period and increase market acceptance of warm-season grasses in transitional climate zones with long winter periods.

For example, seashore paspalum has been shown to provide a green color longer in the fall than bermudagrass, and the green-up of Yukon bermudagrass cultivar was faster in the spring than Princess 77 (13,19). Researchers conducted both studies in northern Italy, in a Mediterranean climate. Furthermore, certain aspects of turfgrass maintenance — such as fertilization, mowing and type of irrigation — can also affect quality, color and dormancy. Superintendents should consider this when evaluating turfgrasses for the length of dormancy.

Fertilization affects the warm-season grass color, growth, yield and greenup. For instance, late fall application of nitrogen (N) fertilizer on bermudagrass can extend fall green color and accelerate green-up the following spring without winter damage (7,8,16,17,18,19).

FERTILIZATION WARM-SEASON GRASSES

However, few studies have focused on the fertilization requirements of seashore paspalum. Once established, seashore paspalum requires less nitrogen fertilization than other turfgrass species (2). Seashore paspalum fairways, tees and athletic fields require nitrogen levels of 2 to 4 lbs. per 1,000 ft^{-2} annually. Published data on bermudagrass suggest that it requires higher nitrogen rates than seashore paspalum (5).

For example, researchers recommend nitrogen application rates of 4 to 8 lbs. N 1,000 ft^{-2} annually for bermudagrass fairways (1). Bermudagrass greens or athletic fields may require nitrogen

fertilization rates of up to 2 lbs. N per 1,000 ft^{-2} per growing month (15).

The objective of this study was to investigate and compare the effects of different nitrogen fertilizers and rates on spring green-up, summer quality and fall color retention of Princess 77 bermudagrass and Sea Spray seashore paspalum when applying non-potable water through SDI. Limited information is available on how nitrogen fertilizers affect the color and quality of grasses when superintendents use saline water for irrigation. There is also a lack of studies that have examined the efficacy of different fertilizer types (granular versus liquid) under SDI.

EXPERIMENT

We conducted a 3-year study at New Mexico State University in Las Cruces,

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TABLE 2

Spring green-up as days of the year to reach 80 percent of green coverage (DOY80) of Princess 77 bermudagrass and Sea Spray seashore paspalum irrigated from either an overhead sprinkler (OSI) or a subsurface drip system (SDI) during the years 2010, 2011 and 2012 as affected by fertilizer type (LSR, Liquid slow-release; GSL, granular slow-release; UG, urea granular; UL, urea liquid).

		Bermudagrass		Seashore paspalum	
		OSI	SDI	OSI	SDI
2010	LSR	143 a†	182	165 a	183
	GSL	125 c	153	150 b	174
	UL	133 b	167	166 a	172
	UG	126 bc	163	152 b	177
2011	LSR	99 d	142	119 c	142
	GSL	95 de	128	112 d	150
	UL	97 de	122	119 c	136
	UG	95 de	130	114 d	147
2012	LSR	91 e	107	98 e	111
	GSL	92 de	103	97 e	115
	UL	93 de	106	98 e	115
	UG	94 de	102	100 e	110

Each value represents an average of two water qualities (potable [0.6 dS/m] and saline [3.1 dS/m]), two nitrogen rates [bermudagrass 4 (low) and 6 (high) lbs N 1,000 ft^{-2} $year^{-1}$; seashore paspalum 2 (low) and 4 (high) lbs N 1,000 ft^{-2} year-1 and three replications.

†Values in each column followed by the same letter are not significantly different from one another (Fisher's protected least significant difference (P = 0.05).

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N.M., to investigate the effects of different fertilization treatments on turf performance when applying water conservation strategies. These strategies include the use of non-potable saline irrigation water and the use of efficient subsurface irrigation systems.

We irrigated two low water use warm-season grasses, Princess 77 bermudagrass (*Cynodon dactylon*) and Sea Spray seashore paspalum (*Paspalum vaginatum*), with either potable [Electrical Conductivity (EC) = 0.6 dS/m] or saline (EC = 3.1 dS/m) water from either an overhead or a subsurface drip irrigation system.

During the growing seasons (March 15 to November 15 of each year), crews fertilized the turf with four different fertilizers treatments. We applied a liquid slow-release, granular slow-release, granular urea and liquid urea at two rates: 2 and 4 lbs. N 1,000 ft^{-2} $year^{-1}$ for Sea Spray and 4 and 6 lbs. N 1,000 ft^{-2} $year^{-1}$ for Princess 77.

The fertilizer treatments were granular urea (46-0-0:N-P-K) (UG), urea liquid (46-0-0: N-P-K) (UL), and liquid slow release (Burley Green 18-2-3:N-PK) (LSR) (12 percent urea, 6 percent triazone nitrogen) (Grigg Brothers) applied every 15 days. The control treatment received a complete granular fertilizer with slow-release nitrogen (20-4-8:N-P-K) (GSR) every 45 days. Nitrogen in this fertilizer consisted of a blend of urea, sulfur-coated urea, ammoniated phosphate, muriate of potash and sulfate of potash magnesia (Helena Chemical Company).

The digital image analysis, visual quality ratings and normalized difference vegetation index determined spring green-up, summer quality and fall color retention.

Crews mowed turfgrasses twice weekly at the height of 0.5 inches with a walk-behind reel mower and removed clippings. The team collected composite soil samples separately for each treatment at depths of 0 to 4 and 4 to 8 inches in March, June and November of each year and analyzed them to determine changes in parameters relevant to soil salinity. Results of soil test analysis for all sampling dates during the experiment (Figure 1).

TABLE 3

Fall color retention (expressed as dark green color index) of Princess 77 bermudagrass and Sea Spray seashore paspalum irrigated from either an overhead sprinkler (OSI) or a subsurface drip system (SDI) as affected by fertilizer type (LSR, liquid slow-release; GSL, granular slow-release; UG, urea granular; UL, urea liquid) and nitrogen rate (bermudagrass [low = 4 lbs. N 1,000 ft^{-2} $year^{-1}$; high = 6 lbs. N 1,000 ft^{-2} $year^{-1}$]; seashore paspalum [low = 2 lbs. N 1,000 ft^{-2} $year^{-1}$; high = 4 lbs. N 1,000 ft^{-2} year-1]).

		Bermudagrass		Seashore paspalum	
Fertilizer	Rate	OSI	SDI	OSI	SDI
LSR	High	0.3122	0.2503	0.2920 bc†	0.2839 cd
	Low	0.3035	0.2517	0.2857 c	0.2899 bc
GSL	High	0.3352	0.2593	0.2927 bc	0.2983 b
	Low	0.3069	0.2536	0.2978 b	0.2774 d
UL	High	0.3185	0.2554	0.2838 c	0.2949 b
	Low	0.3045	0.2749	0.2712 d	0.2836 cd
UG	High	0.3306	0.2655	0.3084 a	0.3143 a
	Low	0.3151	0.2612	0.2881 bc	0.2931 bc

Each value represents an average of 3 years (2009 to 2011), two water qualities (potable [0.6 dS/m] and saline [3.1 dS/m]) and three replications.

†Values in each column followed by the same letter are not significantly different from one another (Fisher's protected least significant difference, α=0.05).

DISCUSSION

The combination of Princess 77 and overhead irrigation reached 80 percent green cover 35 (in 2010), 34 (in 2011) and 12 (in 2012) days faster than SDI-irrigated Princess 77 (Figure 2, Table 2).

Generally, sub-surface drip-irrigated grasses were slower to green-up than overhead irrigated ones (Figure 2). Sea Spray irrigated from the SDI system took 18, 28 and 15 days longer to reach 80 percent green cover in 2010, 2011 and 2012, respectively, than the sprinkler-irrigated counterparts (Table 2).

Regardless of the irrigation system, the turf quality of Sea Spray was always better for the higher fertilization rates (Figure 3). In contrast, different N-rates did not impact the visual appearance of OSI-irrigated Princess 77 and no clear trend was evident as to the impact of nitrogen rate on drip-irrigated Princess 77 (Figure 3).

Liquid fertilization negatively affected the summer quality of sprinkler-irrigated Sea Spray. During two of three summers, the visual

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TABLE 4

Fall color retention (expressed as dark green color index) of Princess 77 bermudagrass and Sea Spray seashore paspalum irrigated from either an overhead sprinkler (OSI) or a subsurface drip system (SDI) as affected by fertilizer type (LSR, liquid slow-release; GSL, granular slow-release; UG, urea granular; UL, urea liquid).

		Bermudagrass		Seashore paspalum	
		OSI	SDI	OSI	SDI
2009	LSR	0.2980 b†	0.2415 b	0.2784 b	0.2639 c
	GSL	0.3406 a	0.2713 a	0.2978 a	0.2798 b
	UL	0.3147 ab	0.2736 a	0.2624 c	0.2663 c
	UG	0.3390 a	0.2849 a	0.2872 ab	0.2948 a
2010	LSR	0.2952 b	0.2278	0.2795 b	0.2841 a
	GSL	0.3084 ab	0.2259	0.2806 ab	0.2705 b
	UL	0.3077 ab	0.2444	0.2710 b	0.2851 a
	UG	0.3276 a	0.2346	0.2917 a	0.2869 a
2011	LSR	0.3304 a	0.2836	0.3086 ab	0.3128 b
	GSL	0.3142 ab	0.2722	0.3074 ab	0.3133 b
	UL	0.3120 ab	0.2775	0.2991 b	0.3164 b
	UG	0.3021 b	0.2705	0.3159 a	0.3293 a

Each value represents an average of 3 years (2009 to 2011), two water qualities (potable [0.6 dS/m] and saline [3.1 dS/m]) and three replications.

†Values in each column followed by the same letter are not significantly different from one another (Fisher's protected least significant difference, $\alpha = 0.05$)

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quality of plots fertilized with either liquid slow-release or liquid urea was lower than Sea Spray fertilized with granular fertilizer.

Subsurface drip-irrigated Sea Spray and OSI-irrigated Princess 77 that received LSR showed greater quality when irrigated with saline water than with potable water (Figure 4). Also, UL combined with saline irrigation water resulted in greater turf quality on OSI-irrigated Sea Spray.

These results differed from OSI-irrigated Princess 77, for which UL and potable irrigation water resulted in greater turf quality than saline water. However, for all the other treatment combinations, water quality did not affect the visual appearance of turfgrasses, regardless of the fertilizer applied (Figure 4). Interestingly, despite higher salt concentrations in the root zones of turf irrigated with saline water for most of the sampling dates (Figure 2), turf quality was either not negatively affected or improved (Figure 4).

Granular urea applied at a high rate resulted in the darkest green Sea Spray compared to all other treatments (Table 3). We recorded the poorest fall color retention on OSI-irrigated Sea Spray on turf fertilized with low rates of UL. On SDI-irrigated Sea Spray, we observed the poorest fall color retention on GSR and UL applied at the low rate and LSR at the high rate (Table 3). The interaction between fertilizer type and the rate did not affect fall color retention in bermudagrass.

The type of fertilizer applied affected fall color retention for 10 of 12 treatment combinations (Table 4). However, as observed with our visual turf quality results, no one fertilizer had the same impact on Dark Green Color Index (DGCI) for all treatments in November. Of the 12 treatment combinations, granular urea applications resulted in best fall color retention on eight and GSL on seven of them, with Sea Spray showing better DGCI response to UG than Princess 77.

Research Takeaways

- Generally, subsurface drip-irrigated grasses were slower to green up than overhead irrigated ones.
- Sea Spray irrigated from the SDI system took 18, 28 and 15 days longer to reach 80 percent green cover in 2010, 2011 and 2012, respectively, than sprinkler-irrigated counterparts.
- The combination of Princess 77 and overhead irrigation reached 80 green cover 35 (in 2010), 34 (in 2011) and 12 (in 2012) days faster than SDI-irrigated Princess 77.
- Fertilization rate and type did not affect the summer turfgrass quality of Princess 77 irrigated from a sprinkler system throughout the research period reaching ratings of greater than seven during all three years. We observed similar results for Princess 77 irrigated from an SDI system during 2010 and 2011.
- During two of three summers, turf quality of Sea Spray plots fertilized with either liquid slow-release or liquid urea was lower than fertilized with granular fertilizer.
- The type of fertilizer applied affected fall color retention for 10 of 12 treatment combinations; however, no one fertilizer had the same impact for all treatments in November.

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Resistance Management: You can't just cross your fingers

Fungicide resistance and rotating modes of action. Yes, we know: we talk about it a lot. But we have to – it's that important. We have to take it seriously not merely for the continued success of our fungicide products, but for the success of the professional turf care industry.

Fungicide resistance develops through the continual, repeated use of the same site-specific modes of action. Mutations occur in the pathogen allowing it to survive the fungicide applications. It then reproduces, and the resistant pathogen spreads, eventually replacing the previous version.

And yes, we realize that you probably know all that.

You probably also know that an important step in fighting turf disease is installing an integrated pest management (IPM) program that will break the disease triangle of host-pathogen-environment. The host, of course, is your grass. The pathogen is the disease-causing agent, and the environment is the conditions that help the pathogen develop, such as moisture and temperature. Change one of those and you can break the triangle.

"The host, of course, is your grass. The pathogen is the disease-causing agent, and the environment is the conditions that help the pathogen develop..."

Here's a fact you probably know all too well: even with an IPM and best management practices, you still might need a chemical to effectively control the target pathogen. And where there's chemical control, there's a possibility of fungicide resistance.

And you know all about FRAC mode of action groups. The industry developed the Fungicide Resistance Action Committee, or FRAC, in 1981, to help manage resistance. FRAC offers guidelines and updated information to help turf pros stay on top of resistance trends, and to develop effective rotation and management programs.

The FRAC code for each active ingredient is found at the top of the product label *(you knew that)*. That code allows you to determine how often fungicides from the same FRAC group are used in consecutive applications, which helps you determine the best fungicide product and mode of action for your rotation program.

And choosing your rotation fungicides is important. You don't want to just choose a product and cross your fingers. In addition to following an effective resistance management rotation program schedule, you want to make sure you have effective fungicides. And when it comes to controlling pythium diseases in turf, you know the one: Segway® Fungicide SC.

When it comes to controlling the four main types of pythium disease: pythium root dysfunction, pythium damping-off, pythium blight, and pythium root rot, Segway is the industry gold standard.

Segway features cyazofamid, an active ingredient with a mode of action in Fungicide Resistance Action Committee (FRAC) Group 21. Segway inhibits all stages of pythium fungal development by stopping spores from germinating.

Segway can be applied two times consecutively, and up to three times per year at the highest labeled rate; six times per year at the lowest rate. Application flexibility and the fact that Segway has no known cross-resistance with other classes of fungicides make it excellent for resistance management programs.

To help our turf partners develop their fungicide resistance management programs, PBI-Gordon developed Rotation Nation, a fungicide and herbicide application program based on specific regions. Each regional program offers a guideline for effective resistance management, with schedules and tips for applying PBI-Gordon products, as well as solutions from other companies.

And that's important: the success of the turf industry literally depends on how we manage resistance. *But you knew that.*

Experts say early scouting for fall armyworms can help prevent major damage as seen here.

Why prevention is key to managing fall armyworm

To minimize fall armyworms' damage, experts say superintendents must look for early warning signs

By Chris Lewis

Although fall armyworms outbreaks are sporadic, as they vary in number from year to year and from location to location, they can be very damaging in large numbers.

Superintendents in some areas, such as the Southeast, experience issues more frequently than in other areas, like the Midwest. Regardless of location, fall armyworms can catch superintendents off guard, which leads them to react when it's too late.

Experts say this is avoidable. First, watch out for birds feeding on the pest. Second, superintendents should scout for damage along the edge of the turfgrass. And, they can observe another usual issue: egg masses. By doing so, experts say they'll stay ahead of fall armyworms.

Rick Brandenburg

"If superintendents treat their turf for white grubs, it will likely have less problems," says Rick Brandenburg, Ph.D., William Neal Reynolds distinguished professor of the department of entomology and plant pathology at North Carolina State University. "But that is not a 100 percent guarantee."

AN OUNCE OF PREVENTION

Brandenburg stresses that superintendents can utilize preventive treatments for fall armyworms. He adds that insecticides with active ingredients chlorantraniliprole, indoxacarb and tetraniliprole offer good residual activity. In addition, he says the residual length will vary, according to the product they choose, along with the rate at which they apply it.

"Superintendents should also consult their local experts for recommendations for preventive approaches," he says. "The key is to not apply these treatments before the threat truly escalates."

Brandenburg says if superintendents apply treatments in early summer, there won't be much impact in the fall. However, applications in later summer with good residuals will provide ample protection when the pest pressure is highest.

"Fall armyworms aren't too difficult to control if superintendents catch them early enough — before their damage is severe," he adds. "Usually, we don't see multiple infestations in the same location either. Once superintendents control them, the likelihood of a secondary infestation is slim."

PHOTOS COURTESY OF: RICK BRANDENBURG

FMC

BEN HAMZA, PH.D.
Director, product development, global specialty solutions

In general, they don't overwinter, except in the southernmost areas of the U.S. Therefore, they resume their life cycles all over again, year after year. According to Rick Brandenburg, Ph.D., fall armyworms' infestations have been observed on a more consistent basis — and have become problematic — over the last 10 to 15 years. Based on these latest trends, superintendents should be prepared for a greater likelihood of fall armyworm outbreaks during the second half of this summer. Turf managers must also start scouting for infestations along the edges and remain on alert until nighttime temperatures start to drop significantly. Since the outbreak of fall armyworms can take place in a relatively short time period, by inspecting for their presence — using a 2 percent solution of water and liquid dishwashing detergent in suspected areas — superintendents could help bring them to the surface and confirm their presence in roughly two or three minutes.

Nufarm

RICHARD FLETCHER
Technical services manager

Management of this pest still follows traditional practices, using preventative measures and integrated pest management (IPM) based curative measures. Longer-term systemic insecticides like clothianidin or chlorantraniliprole are effective on white grubs and have the environmental duration and insect spectrum to also manage this pest. Weather is a significant factor in the likelihood of fall armyworm outbreaks, based on their life cycles. Armyworms can only successfully overwinter as adults in the southern U.S., so there is an annual migration from south to north. The adult armyworm moths are strong flyers, capable of long-distance migration to northern states. The adults are often wind-assisted by weather events like hurricanes. Thus, multiple migration events are possible each summer as the typical life cycle is about 40 days.

Prime Source

BRET CORBETT
Technical services manager

Adults can lay hundreds of eggs that hatch within two to 10 days. You can find egg masses on turfgrass leaves and other nearby areas, including barns, fence posts and mailboxes. Once the eggs hatch, the feeding begins and these larvae can destroy a turf stand within a few days. Treat larvae when they're smaller, as they are most susceptible to treatments. Pyrethroids, carbamates, chlorantraniliprole and the bioinsecticide Crescendo — which can be applied alone or combined — are great options.

Syngenta

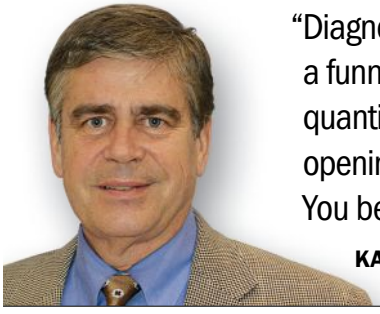
MATT GIESE, M.S.
Technical services manager

Diligent scouting for fall armyworms is still the best strategy for early detection and control. Small fall armyworm larvae feed for about 30 days and generally go unnoticed within the first 21 days. During the final week or two, the late-instar larvae are large and turf damage is much easier to see. Successful control measures can be more challenging against large larvae. Early detection through scouting can reduce the amount of turf damage and boost control success.

Quali-Pro

IAN RODRIGUEZ, PH.D.
Technical services manager

Although their damage is very obvious — as they remove every leaf from their stems — the remaining turf basically looks scalped. Pyrethroids provide quick knockdown of even heavy infestations. Smaller stages tend to hide out in the thatch, so a higher spray volume, like two gallons per 1,000 square feet, can be helpful to maximize contact. Treating a "halo" area 10 to 20 feet beyond the visible damage can help slow or stop their continued spread.



"Diagnosis of turfgrass maladies is like a funnel. A funnel aids in adding a large quantity of a solution into a smaller opening. Turf diagnosis is similar. You begin with a broad view."

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

The complicated nature of diagnosing a turfgrass surprise

I wrote a couple of columns in 2021 dedicated to golf course agronomic "surprises" that occurred during the year here in central Ohio. The first was the arrival of cicadas in the spring of 2021. Since cicadas appear once in a 17-year life cycle, the appearance and sound resonating from these insects were startling.

The second surprise occurred during the fall of 2021, which was the arrival of the fall armyworm. Although fall armyworms appeared sporadically in past years, the turf devastation that occurred this past fall was widespread and severe.

A NEW PEST

This past May, I came across my first diagnosis of annual bluegrass weevil (ABW) damage in central Ohio. The symptoms occurred along the outer edge of the fairway bordering a wooded area. While there have been anecdotal reports of ABW in central Ohio, this is my first confirmed one.

Given the widespread occurrence and predictability every 17 years, the cicada was not that surprising for the Northeast and East North Central U.S. Diagnosing cicadas was not a difficult issue because of the unique chirping sound and walking under the trees often resulted in a cicada falling on you.

Fall armyworm, to a similar extent, was initially shocking but not difficult to diagnose. Fall armyworm damage to turf is a relatively common occurrence in the Southeastern and Southern United States. It sporadically occurs in the Northern U.S. depending on weather events like storms or hurricanes moving north, bringing the armyworm along.

Armyworm damage was devastating and appeared on golf courses, lawns and athletic fields within days of an infestation. All forms of media, including social networks, newspapers, televisions and radio, warned of the damage that could occur. I found a major key to diagnosis was, most homeowners and golf course superintendents used the rapid and widespread coverage the pest received in the press and on social media to identify a fall armyworm outbreak.

MORE COMPLICATED

It's often complex to diagnose a golf course turf problem. The ABW diagnosis was more complex for me than the cicada or fall armyworm, given I had not seen the damage firsthand prior to this spring.

Diagnosis of turfgrass maladies is like a funnel. A funnel aids in adding a large quantity of a solution into a smaller opening. Turf diagnosis is similar. You begin with a large opening (i.e., a broad view). Location, date and weather are a few examples of looking at an overview of the turfgrass problem. In the case of the ABW, the location of the damage was along the outer fairway edges. The damaged area was close to a wooded area.

The damaged area was annual bluegrass and the symptoms looked like anthracnose, which was initially the first impression of the problem. Yet, given the time of the year (May), the weather (which was not favorable for anthracnose) and the fungicides applied (with some activity against anthracnose), it was easy to doubt that hypothesis.

Using the funnel analogy, a closer inspection on my hands and knees revealed the presence of the adult ABW and their larvae. Following a diagnostic process, no matter how obvious the problem, may save you from a misdiagnosis that can result in more turfgrass damage and a waste of time and money in treatment.

The process can vary and may include, and often does, laboratory diagnosis or testing. But increasingly, a helpful diagnostic key — and a confirmation of the diagnosis — is the use of social media. The likelihood of a "new" turf problem surfacing among superintendents in an area is high. Some superintendents will post about the problem, and in turn, become a source of information.

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

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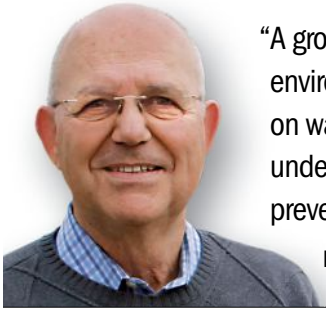

"A growing issue by the end of the '80s was the environmental impact of golf courses, particularly on water quality and wildlife. ... Golf courses were under attack and any bad news, though rare, prevented new course construction."

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

USGA's contributions address environmental issues

In 1983, the USGA Turfgrass Research Program focused on turfgrass stress physiology, breeding, cultural practices and developing the organization's Turfgrass Information File. By 1987, there were 23 projects underway at 13 universities in the U.S. and one project in New Zealand. The annual budget in 1987 was $480K, with $2.19 million total allocated for 1983 through 1988.

A growing issue by the end of the '80s was the environmental impact of golf courses, particularly on water quality and wildlife. The research committee invited Stuart Cohen, Ph.D., James Balogh, Ph.D., and William Walker, Ph.D., to summarize the fate of agricultural pesticides and nutrients. Cohen participated in a groundwater monitoring study of pesticides and nitrates associated with courses in Cape Cod.

The Cape Cod study revealed that nitrate-N concentrations in wells were generally below the 10 ppm federal maximum concentration limit (MCL), with some exceptions. However, golf courses were under attack and any bad news, though rare, prevented new course construction.

NEW RESEARCH FOCUS

As a follow-up to the meeting, the research committee started developing an environmental research program.

The overall objectives were to:

1. Understand the effect of turfgrass pest management and fertilization on water quality and the environment,
2. Evaluate valid alternative methods of pest control, integrated turf management systems, and
3. Determine the human, biological, and environmental factors golf courses influence.

In 1991, the research committee selected 11 pesticide and nutrient fate projects, four environmental benefits projects and six biocontrol projects. The USGA also supported Balogh and Walker in assessing golf's environmental issues. In 1992, they published their report to the research committee in the book *Golf Course Management & Construction — Environmental Issues.*

In 1994, researchers presented pesticide and nutrient fate results at Golf House to summarize three years of research and plan for future studies. In 1995, the USGA renamed the Green Section's research effort Turfgrass and Environmental Research.

IN-DEPTH LOOK

The Crop Science Society of America published five papers from the "Symposium on Pesticide and Nutrient Fate under Turfgrass Golf Course Conditions" in the November-December 1996 issue of *Crop Science.* In 1998, the American Chemical Society (ACS) and USGA co-sponsored a symposium at the summer ACS meeting in Boston. John M. Clark, Ph.D., helped coordinate the meeting. ACS published its Symposium Series 743, "Fate and Management of Turfgrass Chemicals," in 2000.

The first section discusses knowledge, at that time, of environmental issues concerning the USGA, the scope, benefits and makeup of the turfgrass industry with particular emphasis on golf courses, and a review of turfgrass management from an agrochemical viewpoint. Following sections go on to review research on the environmental fate of nutrients and pesticides applied the turfgrass. Seven chemical management strategies for reducing environmental and human exposure are discussed before the final section presents novel biotechnological and alternative (non-chemical) pest management approaches to maintain turfgrass in a less chemically-dependent fashion.

The USGA helped fund proceedings from the January 2006 meeting held by Council for Agricultural Science and Technology (CAST). The CAST Special Publication 27 "Water Quality and Quantity Issues for Turfgrasses in Urban Landscapes" summarizes the USGA research to protect and conserve water.

Most of this research helped develop the Golf Course Superintendents Association of America's best management practices for all 50 states. I often wonder where golf would be today without the significant contribution the USGA, allied associations, universities and government agencies made to address golf's environmental issues in the 1980s.

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

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Get to know annual bluegrass weevil

Albrecht Koppenhöfer, Ph.D., and Ben McGraw, Ph.D., discuss the best actions to control ABW

By Golfdom Staff

Superintendents can find annual bluegrass weevil (ABW) in the Eastern part of the country and Canada, although entomologists identified the pest as far west as Wisconsin and as south as Virginia. Albrecht Koppenhöfer, Ph.D., professor and Extension specialist at Rutgers University's department of entomology, and Ben McGraw, Ph.D., turfgrass science professor at Penn State University, share what superintendents need to know about this notorious pest.

Resistance Management — There are pesticide-resistant ABWs, depending on location. Koppenhöfer said it's important to rotate modes of action to prevent further resistance.

"We are concerned that the overuse of the remaining effective insecticides will desensitize ABWs to these compounds as well," Koppenhöfer said. "Golf course superintendents need to delay resistance development by applying control products only when and where necessary. That requires monitoring and sampling methods."

Windows to Treat — Superintendents should think about ABW treatment as being in two windows: managing overwintering adults before egg-laying with short-residual, broad-spectrum insecticides and targeting the pest as larvae. Unfortunately, as Koppenhöfer mentioned, pyrethroid-resistant populations continue to expand across a wider region. Research also shows ABW populations also show insensitivity to non-pyrethroid insecticides.

A more curative approach, McGraw said, is to focus on targeting larvae as the pest moves out of the turf. This includes using integrated pest management (IPM) protocols which involve applying controls when the pest is present and above damage thresholds of 30-40 larvae per square foot.

"Our studies indicate that greater numbers of larvae are present during the first generation and potentially more damaging than following generations," McGraw said. "However, the probability of successfully controlling the first generation is greater than subsequent generations since summer generations (second and third) will overlap with earlier generations. Sampling turf in the summer often reveals all life stages in the same area."

Combined Approach — Koppenhöfer and McGraw said superintendents need to think about multiple applications in the spring, especially in areas with high ABW pressure.

"It should be stressed that the larvicide application of the combination approach may not be warranted and should only be applied if sampling reveals that the larval population has exceeded thresholds," Koppenhöfer said.

McGraw and Koppenhöfer's research shows *Poa annua* is 10 to 15 times more susceptible to damage than creeping bentgrass. Superintendents with primarily *Poa* courses could benefit from larvicide applications to keep populations low. But, superintendents need to understand that regardless of turf variety, it's about management, not eradication.

Scout, Scout, Scout — Another key element to ABW management is scouting. If superintendents opt for IPM, scouting becomes key to understand the amount of pest pressure found on the course.

"Scouting requires destructively sampling turf, typically by removing cores with a cup cutter or knife and placing the material in a saturated saline solution to extract larvae," McGraw said. "Sampling is critical for determining when larval populations are about to move out of the plant and are susceptible to larvicides. However, it's impractical for most superintendents to obtain detailed estimates of population structure."

A recently emerged overwintering annual bluegrass weevil adult.

PHOTO BY: BEN MCGRAW

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(Photos: Ben McGraw, Penn State University)

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Deere.com

2 Rams Horn Lace-To-Toe boot

The Rams Horn from Rocky Boots meets the American Society for Testing and Materials F2413 protective toe classification and electrical hazard standards and provides an oil and slip-resisting rubber outsole for stability in any working condition. The boot features Rocky Rebound Comfort technology for energy return, a flexible direct attached PU midsole and an EnergyBed LX Footbed with memory foam. Styles are available in 6- and 8-inch boots and come in brown and black colors.
RockyBoots.com

3 Outscape

The Outscape from **MUCK BOOTS** is a lightweight, waterproof lace-up shoe. The Outscape offers a rubber toe and heel for durability and a breathable mesh lining to facilitate air circulation to reduce heat and moisture. The shoe also features memory foam and has a comfort range for temperatures below freezing to 65 degrees F.
MuckBootCompany.com

5

6

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SoilTechCorp.com

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007XL from **DLF** received the No. 1 rating in the Rutgers turf evaluation trial for the last four years for greens and fairways, according to the company. 007XL has fine leaves, is uniformly dense and has dollar spot and anthracnose resistance. Other features include high wear tolerance, early spring green up and cool weather performance.

DLFPickseed.com

6 | Makita 18V LXT Brushless Cordless String Trimmer

MAKITA's 18V LXT Brushless Cordless String Trimmer Kit delivers up to 6,000 RPM and up to one hour of run time when using an 18V LXT 4.0Ah battery. It features a variable speed trigger to control cutting speed and a high/low button to manage power and run time. The rapid load bump-and-feed trimmer head loads line in seconds.

MakitaTools.com

The 19th Hole

Matt DiMase

DIRECTOR OF AGRONOMY AND LANDSCAPE //Abaco Sporting Club, Marsh Harbour, Abaco, Bahamas

Matt, what are you having? A *Juan* Daly, not John. Refreshing … with a good tequila.

Tell me about the club. We are a private club. We are called a sporting club because we have more than golf. We have three different types of boats. We offer kitesurfing and electronic surfboard lessons. We've got one of the prettiest beaches you've ever seen. And the golf course is 18 holes of championship links-style golf that's a Tom Mackenzie and Donald Steel design. It's one of the hardest golf courses you'll ever play. There's a reason why PGA Tour players are members here.

How did you get into the business? Originally, I wanted to be a cop. I was going to school for criminal justice, but the only two jobs on my resumé were maintaining baseball fields and golf courses. When I interviewed after taking the NYPD test, the lieutenant said to me, 'you know I've never heard of a superintendent being shot at. Have you ever thought about that for a career?' On the plane ride home, I bought a golf magazine and that's how I found the Mundus Institute / San Diego Golf Academy.

Have you seen *Top Gun: Maverick* yet? I loved it, how could you not? Tom Cruise did everything right with that movie. I can't remember the last time I went to the movies. I bought four tickets; my wife said you're crazy, it's just the two of us! I splurged because I didn't want anybody sitting on either side of us. I wanted to be able to enjoy that movie.

//BEST ADVICE

"IF YOU LOVE WHAT YOU'RE DOING, IT'S NOT CONSIDERED WORK. I GENUINELY LOVE GETTING UP AND DOING WHAT I DO — I CONSIDER IT A PRIVILEGE."

You mentioned Darren Clark. Is he a member there? Yes, he's been here since day one. I met him on my first day on the job. Darren Clark, Lee Westwood, Charl Schwartzel and Danny Willett are on No. 1 tee. I have my suitcase in my golf cart. The golf course was not in very good shape. I introduce myself and Darren says, 'I have an event here in two weeks. What can you do to make the course more presentable?' I said give me 10 days. He left and came back for his event and told me, 'I don't know what you did, but you obviously know what you're doing.' Our relationship blossomed from there. We play quite a bit of golf after 3:30. I can't say enough good things about the guy — he gets it. He's a guy's guy.

If I'm ever there, what's one thing I have to do beyond seeing the course? You've got to get a boat for a day. There's so much to see and do. There are so many outer keys with great local bars. Rum punches anywhere, and you stick to the rum punch because every place makes it just a little bit different. And you don't want to go from a rum punch to a tequila … I learned that lesson.

As interviewed by Seth Jones, July 7, 2022.

PHOTO COURTESY OF MATT DIMASE; KYLE BEIDENBACH (DARREN CLARK); GETTY IMAGES / ISTOCK-GETTY IMAGES PLUS / EHSTOCK (DRINK); WATEROTTER (KITE SURFER)

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