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"I'm trying not to let these moments pass me by too quickly without properly appreciating them. Change is a part of life."

SETH JONES, Editor-in-Chief & Associate Publisher

Once in a lifetime

M*oment in time:* I'm at the Hall of Justice (aka, the HOJ, my garage), working on this issue. The jukebox is cranking out the Steve Miller Band. My dog and cat — sworn enemies — look at each other and then at me, in confusion, as five guineas — the neighbors' — walk between them, honking loudly.

As David Byrne sang in "Once in a Lifetime" by the Talking Heads:

*You may find yourself
in a beautiful house,
with a beautiful wife;
And you may ask
yourself, "Well, how did
I get here?"*

I've been having a lot of those "how-did-I-get-here?" moments lately. The most recent one was in mid-May as I watched my daughter, Evey, walk across the stage and accept her high school diploma. How did she just suddenly graduate from high school? Where did the time go?

I'm trying not to let these moments pass me by too quickly without properly appreciating them. Change is a part of life. And as someone once said, change is good.

There are also some changes to tell you about here at *Golfdom*. The first one is that we're welcoming a new designer to the magazine. The second is a new title (job?) for your pal Jonesy.

First, it's my pleasure to welcome and introduce you to Courtney Townsend, the magazine's new graphic designer.

Courtney has worked with us at North Coast Media for 10 years on our sister brands (titles include *Landscape Management*, *Pest Management Professional*, *GPS World*, *Pit & Quarry* and *LP Gas*). She was recently promoted to the company's Creative Director, and with that, she gets to design the best-looking magazine at the company, the always picturesque *Golfdom*. Courtney is as talented as she is funny, and even

though she's a big Michigan fan (kidding!), we're thrilled to have her on the team. Welcome aboard, Courtney!

The next part is my new job title: I've added the title of brand manager, *Golfdom*, to my business card. I remain editor-in-chief of *Golfdom* and editorial director at North Coast Media.

When the new title was presented to me, our CEO, Kevin Stoltzman, asked me, "What is *Golfdom*?"

Is it a magazine? A website? A combination of the two?

When I was hired here some 15 years ago, it was to be the editor-in-chief of a print magazine and a website. Pretty quickly, I learned about the idea of the *Golfdom* Summit, and that I would eventually be the event's moderator. Then I learned that I would be in charge of

the magazine's social media ... the magazine's handling and coverage of trade shows and professional golf tournaments ... the magazine's YouTube channel ... and so on.

Not to get too inside baseball here, but the good news is I was promoted into a new title because there is much more to the *Golfdom* brand and identity than physically publishing a magazine.

What is *Golfdom*? Above all else, I think it's a community. It's a group of people with a common job who want to stay informed and in touch. And I'm happy that it's my job to manage this brand. I want to see it succeed, and I want it to help you succeed.

Moment in time: Evey's graduation party is at the HOJ. About 60 people are spread out at tables and inside. Jerry and Richard are playing shuffleboard. Jimi Hendrix is on the jukebox. A taco truck is in the driveway.

Suddenly, a parade of motorcycles begins to pass by the house. They each rev their engines, and many throw fists in the air or the occasional peace sign. The parade keeps going. And going. Literally, more than 400 motorcycles rev by the house, adding to the celebration.

I don't know exactly how I got here, but I love it.

Email Jones at:
sjones@northcoastmedia.net

Starter

NEWS, NOTES AND QUOTES



//THIS ONE GOES TO 11



The Sandmines expansion is one of several recent Pinehurst developments, including other course and facility renovations and the USGA's new on-site headquarters.

COORE AND CRENSHAW TO CREATE PINEHURST NO. 11



A new chapter for Pinehurst Resort is set to begin as construction on Pinehurst No.

11, designed by Bill Coore and Ben Crenshaw, is scheduled to start later this year at the Sandmines property in Aberdeen, N.C. The course is expected to open for play in fall 2027, adding to the resort's growing reputation as a leader in American golf, according to the resort.

The Sandmines property, a 900-acre tract five miles south of Pinehurst's main campus, was once used for sand

mining in the 1930s. This industrial past has left behind a landscape marked by spoil piles, ridges and reclaimed natural elements, providing a distinctive canvas for Coore and Crenshaw's design. The duo, known for their philosophy of letting the land dictate the course, see the site's "choppy, ridgy ground" as an opportunity to create a layout that is intimate, quirky and reminiscent of classic links in Ireland or Scotland — despite its inland location.

Pinehurst No. 11 will neighbor Tom

Doak's Pinehurst No. 10 which opened in 2024 and quickly earned accolades, including a top-15 debut in North Carolina's golf course rankings and recognition as "Best New Course" by *Golf Digest*. While No. 10 is celebrated for dramatic eleva-

Continued on page 5

//SHOW ME THE MONEY

ROUNDS 4 RESEARCH SETS RECORD

For the fourth year in a row, the GCSAA Foundation's Rounds 4 Research program supporting turfgrass research broke records, yielding \$753,135 during its April 21-27 online auction, an increase of \$63,135 over 2024. The GCSAA Foundation is the philanthropic organization of the Golf Course Superintendents Association of America (GCSAA).

Rounds 4 Research helps address a critical shortage of funding for ongoing, university-based agronomic research, education, advocacy programs and course operations.

More than 1,800 rounds of golf were donated for an online auction, including

bucket-list courses like Pinehurst Resort, TPC Sawgrass and Sutton Bay.

The national campaign is presented in partnership with The Toro Co. The program has raised nearly \$5 million since launching in 2012. For more information about GCSAA's Rounds 4 Research, visit rounds4research.com.



//BETTER BUSINESS

IN SEARCH OF THE NEXT GRAFFIS WINNER

For 13 years *Golfdom* has honored a superintendent with the Herb Graffis Businessperson of the Year award. Named in honor of the magazine's co-founder, Herb Graffis, the award recognizes a superintendent who does remarkable work in maintaining pristine course conditions and also in making savvy moves to better the business of the course. Several previous winners have used the award to elevate their own careers.

To nominate a superintendent, email *Golfdom* Editor-in-Chief Seth Jones at sjones@northcoastmedia.net. Nominations will be accepted for the 2025 winner until Aug. 1.



// LIKE FATHER, LIKE SON

Plant Food Company adds a Weinert

➔ Plant Food Company, a third-generation family-owned fertilizer manufacturer, named Michael Weinert as its new Northeast consultant. Weinert brings a unique blend of industry experience and personal connection to the role, having grown up immersed in the golf industry as the son of Tom Weinert, the company's vice president of sales.

Michael Weinert's career began at Lehigh CC in Pennsylvania where he worked as a caddy before gaining experience in golf operations and turf management at Paramount CC. His responsibilities expanded at Glen Oaks and Fresh Meadow, where he managed turf spray programs and developed a passion for plant nutrition and environmental stewardship.

The Northeast is home to some of the oldest golf clubs in the United States, and Weinert said he sees his new role as an opportunity to help preserve these historic venues.

"It's almost like I get to preserve history and the enjoyment of people getting to play these historical artistic creations," he said.

Weinert's background as a competitive golfer — having qualified for the



Michael (right) and Tom Weinert together at a recent golf outing. The father/son duo, who already made for a mean scramble team, are now coworkers.

2019 MET Open and competed in the New York State Open and Florida mini-tours — gives him insight into the needs of both superintendents and players. He emphasizes the importance of understanding how turf conditions impact play, stating that "when a player hits a good shot and it reacts as it should, that's where the magic is."

Continued from page 4
tion changes and expansive vistas, No. 11 is expected to offer a more winding, nuanced experience, with dramatic landforms and a focus on playability through natural contours.

The expansion at Pinehurst Sandmines comes amid a broader renaissance for the resort, which has recently

renovated several courses and facilities and welcomed the USGA's new headquarters on site. The Sandmines area will soon feature a new 6,000-square-foot clubhouse, a restaurant and guest lodging, further enhancing Pinehurst's appeal as the largest golf resort in the U.S., with 207 holes upon No. 11's completion.

// ACC COUNTRY

SBI '25 ACCEPTING APPLICATIONS

Syngenta is now accepting applications for the 2025 Syngenta Business Institute (SBI) professional development program. SBI will be held at the Graylyn International Conference Center in Winston-Salem, N.C., from Dec. 2-5. Superintendents have until Monday, Aug. 11, to apply online.



"We're proud to offer this valuable opportunity to superintendents for the 17th year," said Stephanie Schwenke, turf market manager for Syngenta. "We recognize the increasing demands they face, including business management, labor shortages and the need to uphold turf quality. Participants leave the program equipped with fresh strategies to elevate their golf course management."

In partnership with Wake Forest University's Executive Education program, the 2025 SBI curriculum will feature educational courses designed to teach superintendents critical business leadership skills. Superintendents will also be given the opportunity to build valuable connections with industry professionals throughout the week. Upon completion, participants will earn 1.5 GCSAA Education Points.

// FLORIDA IN DECEMBER?

GOLFDOM SUMMIT NOW ACCEPTING APPLICATIONS

Superintendents who are interested in meeting with a small group of fellow superintendents from around the country, as well as 20-plus industry partners and the team at *Golfdom*, are encouraged to apply to attend the 2025 Golfdom Summit.

Dates this year are Dec. 10-12. The event will again be held at Reunion Resort, near Orlando. Limited to only 45 superintendents each year, attendees get to meet with the magazine's partners in one-on-one settings to discuss each course's challenges individually, rather than at a busy trade show. Boardroom presentations, a round of golf and the annual Legends induction are also part of the agenda.

To apply, visit GolfdomSummit.com.

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Salvatore Strano, Product Manager at PBI-Gordon, shares the story behind SpeedZone EW's evolution: "SpeedZone was a flagship product



Salvatore Strano

for us for many, many years, and then we brought the EW formulation out in 2018. It was essentially a next-gen product with an improved, innovative

formulation, making it more user-friendly while maintaining top-tier performance."

This advanced EW (emulsifiable-in-water) formulation is designed to deliver rapid, visible results, setting it apart from competitors. Strano emphasizes, "You get visual effects within a couple of hours. That speed of kill and efficacy is what separates SpeedZone EW from a lot of other products."

Golf course superintendents face the ongoing challenge of controlling stubborn weeds that threaten turf quality. SpeedZone EW excels against over 90 broadleaf weed species, with particular strength against dandelion

and clover, the most common and persistent offenders. Strano notes, "SpeedZone EW smokes dandelion and clover. You also get some activity on goosegrass, another prevalent weed, though it may require a second application or combination treatment."

Melissa McDonald, who oversees communications and marketing at PBI-Gordon, highlights the product's reputation: "PBI-Gordon and SpeedZone are almost interchangeable in the industry. When people hear PBI-Gordon, they think SpeedZone, and that trust carries over as we expand our portfolio."

"Eventually, with SpeedZone EW, you'll use less product and treat less area, which is better for the environment and turf."

Strano adds that the product's unique formulation combines four active ingredients, a challenging feat few companies can achieve: "Our formulation innovation allows us to put four tough-to-combine active ingredients together without losing efficacy. That dependability is a huge part of why superintendents keep returning to SpeedZone."

SpeedZone EW is formulated for both cool-season and warm-season turf, with a specialized version called SpeedZone Southern EW designed for sensitive southern turf species. McDonald notes SpeedZone EW Southern utilizes the same innovative formulation technology as SpeedZone EW with a slight tweak to the active



Melissa McDonald

ingredients to better fit the needs of warm-season turf types while still maintaining the fast and effective control SpeedZone is known for.

In today's environmentally conscious landscape, sustainable weed control is more important than ever. Strano explains how SpeedZone EW fits into a long-term sustainable program: "The more weed-free you create a healthier stand of turf, resulting in less SpeedZone EW applications needed over time, ultimately requiring less material being applied to the environment."

PBI-Gordon doesn't just provide a product — it offers a full support system. McDonald explains, "We have training modules, presentations and a dedicated team of R&D experts who work directly with golf courses to provide real-world guidance."

Strano also emphasizes their responsive technical service: "When customers call our 1-800 number, they get a live person immediately. That quick, knowledgeable support makes a big difference for turf managers."

Despite being a well-established product, SpeedZone EW continues to grow in popularity. For golf course superintendents and turf managers seeking a reliable, fast-acting herbicide that delivers exceptional results, SpeedZone EW from PBI-Gordon is the clear choice. Experience the difference with SpeedZone EW, where speed meets dependability.

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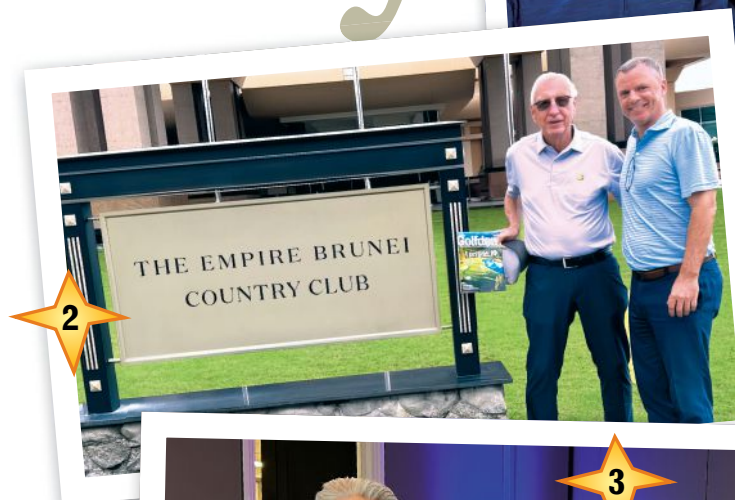
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Golfdom Gallery

1 A familiar face Golfdom's Seth Jones (left) ran into longtime Kansas superintendent and fellow Jayhawks fan Gary Higbie at Johnny's in Kansas City.



2 Golfdom in ... Brunei? That's longtime Friend of Golfdom Mike Bavier, CGCS-Retired, with Stan Everitt, PGA, director of golf and leisure at The Empire Brunei CC. Thanks for being our international ambassador, Mike!



3 Face-to-face meeting Even though Benton Hodges (middle), Mountain West Turf Technologies, has been writing for Golfdom for a year now, this was our first time meeting him in person. Hodges gave a presentation on new turf technologies at the recent Envu meeting in Dallas and then took time for this photo with Seth and Chad Noyes, campaign manager, turf and ornamental, Envu



4 I wanna go fast At Texas Motor Speedway, Craig MacGregor, associate brand manager, Golfdom, showed everyone he was ready to capture the checkered flag.



5 Three Ricky Bobbys Jones with Eric Johnson, Chambers Bay GC, University Place, Wash., and Tim Huber, CGCS, the Club at Carlton Woods, The Woodlands, Texas, as they prepared to take the track at Texas Motor Speedway. Envu treated the guys to the David Starr Racing Experience, which allowed them to drive 10 laps around the track.





6 From speedway to SpeedZone It was a short (and slower) drive for Jones to meet up with the PBI-Gordon team at their headquarters in Kansas City, Kan. From left to right are Jones, Callie Zevecke, Dale Sanson, Ph.D., Melissa McDonald, Dani McFadden, Ph.D. and John Kenny, holding the SpeedZone.



7 Dinner on the dock During the recent Turf and Ornamental Communicators Association (TOCA) meeting, the *Golfdom* team met up with their friends at John Deere and Sod Solutions. From left to right are Bill Roddy, group director, *Golfdom*; MacGregor; Scott Hollister, editor, *Golfdom*; Darius Lane, John Deere; Valerie Smith, Sod Solutions; and Cecilia Johnson, Sod Solutions.



8 Take me out to the ballpark Aaron Tipton, director of grounds, College of Charleston, and K.C. Bell, director of grounds, Clemson Athletics, spoke to TOCA members about the challenges of maintaining college sports fields.



9 A step back in time While John Perry (far right), president, Greene County Fertilizer Co., was in Kansas City, Seth and Scott were sure to show him Up-Down, Kansas City's vintage coin-operated arcade and bar.



10 Kansas State Wildcats everywhere Jones can't go to any sports bar in Kansas City and not catch heat from his Wildcat friends. Here he is with former superintendent Ryan Bourne, who now works for Van Diest Supply Co., and Sam Spanel, who is studying marketing with an emphasis in golf at Kansas State University in Manhattan.



“It is amazing how much you can push and make things happen when there is a deadline motivating it.”

ALAN FITZGERALD, CGCS, MG
Rehoboth Beach (Del.) Country Club

The difference between good and great

My years seem to start out the same. It's late spring. The new golf season is approaching fast. My winter project deadline, once fluid, and the actual need-to-be-done by date, which were weeks apart, are quickly converging.

I've never liked promising things I can't fully control — after all, Mother Nature controls too much of what we do in this business. That said, I like realistic goals that I know I can hit while at the same time setting my own earlier target date — even if it is more wishful thinking than any real certainty. Although some would argue that these timelines often live in fantasy land, over the years, setting “Alan goals” has ensured that I never missed a hard deadline.

Coming out of COVID-19, I had several large projects that had not only weather delays to contend with, but also the supply chain delays due to literal slow boats from China. It is amazing how much you can push and make things happen when there is a deadline motivat-

ing it. Laying the last piece of sod hours before a bridal shower might panic the planners, but once it is down and it all looks great by the time people arrive, it still counts. Everyone is happy, and the deadline was met.

This past winter was no exception. The start date for a major redesign of a par-3 hole got pushed back repeatedly due to a number of factors until just before we reached the critical point. Could it be completed by the start of the season or should we hold off and delay it until next winter? The weather to that point had been relatively kind, so with my usual rose-tinted optimism (and maybe a touch of ego), and glossing over any potential weather delays, I decided we had (just) enough time to go ahead.

My assistants questioned it, I think the architect thought I was a bit crazy, but we went for it. It started well and the ego was happy, then it rained, then the equipment literally started sinking... On the days we could work, it meant grading mud — until it dried out and then we were grading dust — neither of which is a wonderful medium to shape the earth with, as it doesn't stay where you put it. Still, we pressed on and got it finished on schedule.

A few weeks ago, I had a conversation with another architect about superintendents doing construction work in-house. He mentioned that there are those who can *do construction work*, and then there are those who can *do construction*. There is a big difference. It reminded

me of very early in my career when I first saw the difference between a bulldozer operator and a shaper. Both were very competent at driving the machine, but there is a big difference between the finished product of each. Grading with the machine is one thing; crafting a vision into the landscape is another.

There is a temptation in projects to slap things down and call it good enough. That might fly at the very end when time is tight, but if you approach the whole job with that attitude, the result will always fall short. Doing in-house construction well requires planning and high standards from the very beginning. And having a team that is trained well and experienced in this work is essential to this success.

Of course, experience only comes with exposure, so there is always a chicken-or-the-egg situation — how does the team get the experience without having done the work before? There has to be a learning curve to make mistakes and train people to work to their strengths. It has always amazed me how talented people can be when they are given the opportunity to try new skills. Then it's only a matter of time until it's a team who can construct rather than a team who can do construction. **G**

Alan Fitzgerald (superintendent@rehobothbeachcc.com) is superintendent at Rehoboth Beach (Del.) Country Club.

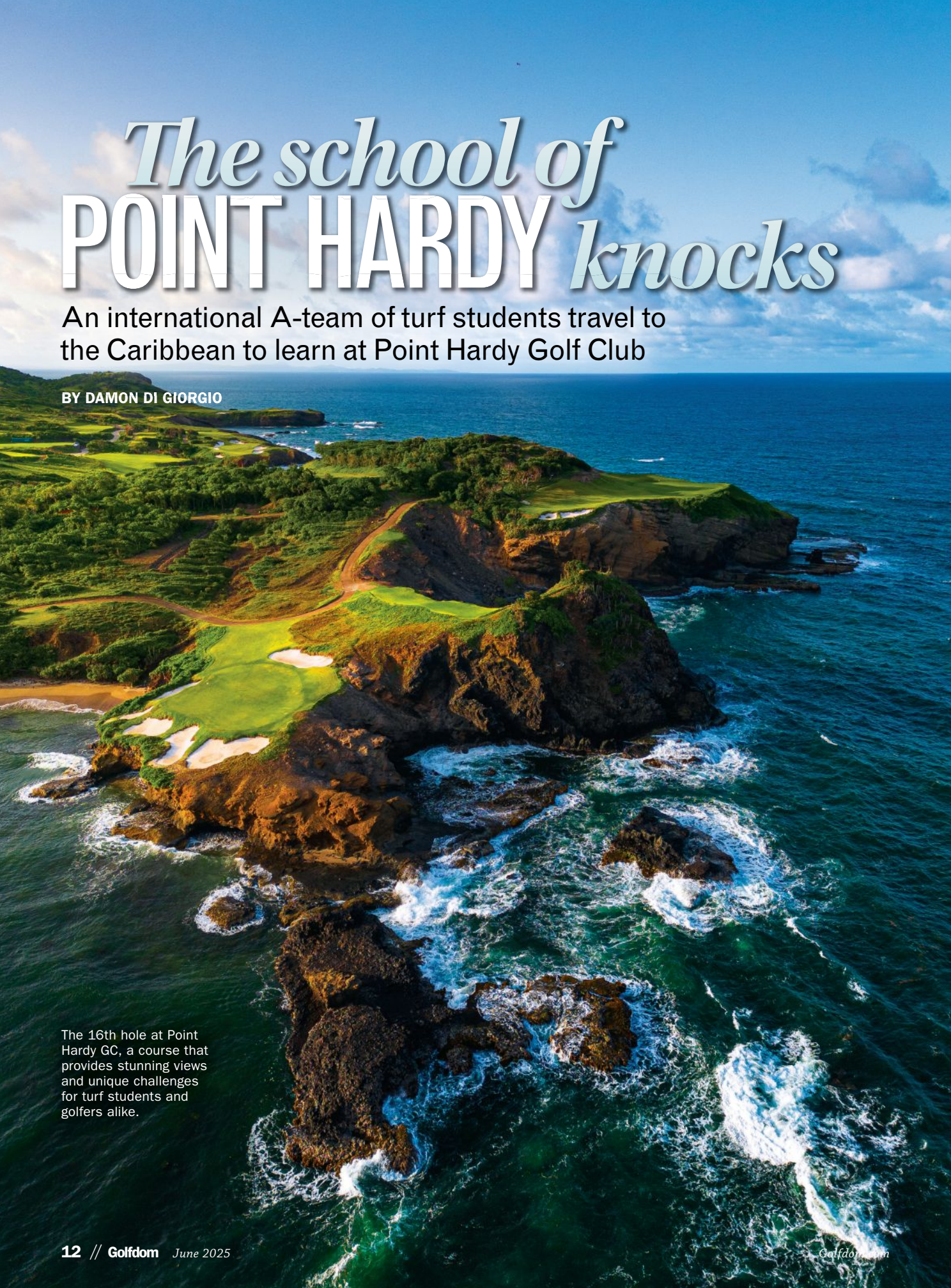


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An aerial photograph of a golf course situated on a rugged, rocky coastline. The green fairways and sand traps are perched on cliffs overlooking the ocean. Waves are crashing against the rocks in the foreground. The sky is blue with some clouds.

The school of **POINT HARDY** *knocks*

An international A-team of turf students travel to the Caribbean to learn at Point Hardy Golf Club

BY DAMON DI GIORGIO

The 16th hole at Point Hardy GC, a course that provides stunning views and unique challenges for turf students and golfers alike.

Cabot Saint Lucia has quickly become a special place in the Caribbean. I was fortunate to be there at the very beginning with a challenging but successful grow-in at Point Hardy Golf Club during 2022-23. The golf course has 1.5 miles of coastline, with nine holes navigating along the water and inlets, and the remaining nine holes arranged through the island terrain and over rocky outcrops. The golf course was designed by architects Bill Coore and Ben Crenshaw and recently was ranked 76th of the Top 100 Courses of the World by *Golf Magazine*.

I have been fortunate to maintain turf on golf courses with amazing tropical island views in the Caribbean. I enjoy mentoring the next generation of golf course superintendents and greenkeepers, which I learned early in my career working for George Thompson, CGCS, at the Country Club of North Carolina in Pinehurst. At Cabot Saint Lucia, we've developed a sort of "winter internship" or "winter work experience" program for turf students and also for those early in their careers that want to learn how to manage turf on a tropical island.

Housing is provided in the main business area of Rodney Bay where restaurants, shops and the beach are just a few minutes walk. The interns seem to enjoy Friday evenings when the local town converts the main street into an outdoor food and music festival.

Meet the interns

The 2024-25 winter season in St. Lucia consists of typical tropical weather for the Caribbean with plenty of sunshine and air temperatures in the 80s during the day and 70s at night. This season's team represents an impressive list of international golf course experience and skills: two Canadians, one from the Netherlands, three from England, one from Venezuela and one from the United States.

Anna Riopelle is from Ontario, Canada.

She holds two Bachelor of Science degrees in recreation and in management from Dalhousie University, located in Halifax, Canada. Anna plays and coaches hockey, and her interest in sports has led her to extensive golf course experience in Canada.

Another fellow Canadian, Bradley Sperling, has a degree in horticulture and turf management from Olds College (Olds, Canada). He works on golf courses in Alberta, Canada, and has PGA Tour tournament experience in Mexico, California (Riviera Country Club) and Florida (TPC Sawgrass).

Tom Hampshire is from Wokingham, England. He is currently pursuing turf management studies at the University of Guelph (Guelph, Canada). He has both landscape and golf course management experience in Canada and England.

Antonie Jorne Haagoort is from the Netherlands. He's worked on golf courses in Belgium and Australia.

Thomas Webster is from England. He earned a horticulture degree from Myrcosough College (Preston, England) and has worked on golf courses in England, Norway, Sweden, Australia and Austria.

Max Fuhri is also from England. He completed an apprenticeship in sports turf management from Easton and Otley College (Norfolk, England), and has worked on golf courses in England, Australia, New Zealand and Norway.

Andrew Augeri is from New Hampshire, very close to the Massachusetts border. He began his turfgrass management studies at Penn State University (Berks Campus in Reading), and now continues at the University of Massachusetts (Amherst). Andrew started working in the clubhouse but quickly became interested in the turfgrass management side of the business. He asked the golf course superintendent if he needed help, and now he's focused on a career in

"I have been fortunate to maintain turf on golf courses with amazing tropical island views in the Caribbean. I enjoy mentoring the next generation of golf course superintendents and greenkeepers."

— DAMON DI GIORGIO

turfgrass management. He has worked on golf courses in Massachusetts for the past three years, but his advisor at Penn State, Mike Fidanza, Ph.D., suggested he gain some experience on warm-season turf.

Another intern, Ernesto Martinez, is a student enrolled in Penn State's two-year certificate program. I first met him when I spoke at a Penn State Turf Club meeting. He is from Venezuela and, last summer, he worked at Real Club Valderrama in Sotogrande, Spain.

Meet the assistants

Edoardo Fauro is from Sardinia, Italy. He studied sports turf management at Elmwood College (Cupar, Scotland). He has worked on several golf courses in England, and has tournament experience at the Ryder Cup in 2023, held at Marco Simone Golf and Country Club (Rome, Italy) and the 149th Open Championship held at Royal Saint George's Golf Club (Sandwich, England).

Brian Mabuza is from Eswatini (formerly called Swaziland). He worked at the Union League Golf Club at Torresdale (Philadelphia) and is currently enrolled in Penn State's World Campus pursuing a Master of Professional Studies in turfgrass management.

Jerry Mulvihill is the golf course superintendent at Lofoten Links, located above the Arctic Circle in Gimsøysand, Norway. Prolonged winter snow cover has been a great excuse for Jerry to contribute much-needed seasonal support here in St. Lucia.

Continued on page 14

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Continued from page 13

Class is in session

Fidanza visited Andrew and the other interns and spent the day doing a “walk and talk,” examining various putting greens, soil profiles, some back-and-forth questions and answers and discussing how to manage the seeded Pure Dynasty seashore paspalum.

A component of Andrew’s time in St. Lucia was to monitor soil moisture, soil salinity and soil pH on all putting greens as part of a preliminary study on environmental monitoring, guided by Fidanza and Rick Brandenburg, Ph.D., North Carolina State University. Andrew also measured the pH and salinity of our irrigation water (Table 1). We have an on-site reverse-osmosis facility to desalinate the ocean water, which is then stored in a pond.

“The idea of having students work and participate in experimental learning over the winter, where most students would not be working at their local course, and (having) the ability to go somewhere to keep their turf management skills sharp and learn a new way of managing turfgrass, is fantastic,” Andrew told me. 

Damon Di Giorgio is director of agronomy at Point Hardy Golf Club, Cabot Saint Lucia (www.cabotsaintlucia.com), located in St. Lucia in the Caribbean. Contact him via email at Damon.DiGiorgio@cabot.com.

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This par 3 requires a reach over the bay to land safely on the other side. Notice the cactus growing along the sloped area. St. Lucia has a wet season and also a dry season which favors the growth of those cactus species along the coastline.

PHOTO COURTESY OF DAMON DI GIORGIO

With greens, keep it simple

We asked Di Giorgio how he keeps his greens true and his demeanor cool

P oint Hardy Golf Club recently hosted its first member-member to rave reviews. Two of the members are PGA Tour players and commented on the pureness of the greens, adding that they thought the course could host a PGA Tour event.

And that's saying something, because the greens are not USGA spec by any means; they're built on sand that was crushed here on the island and trucked to the site. We use the USGA's GS3 golf ball to measure smoothness and trueness. It's one thing to hear people say the greens are true, but it's another thing to get a reading and see it proven in the numbers.

When it comes to maintaining the greens here, we keep it simple. We do light, frequent verticutting. We dust the greens



▲ Mike Fidanza, Ph.D., (far right) discussing the challenges and benefits of maintaining seashore paspalum in the Caribbean.

Continued on page 16

PHOTO COURTESY OF: DAMON DI GIORGIO

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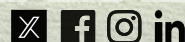




TABLE 1

Irrigation water pH and salinity at Point Hardy Golf Club, Cabot Saint Lucia.

Irrigation Water Source	pH*	Electrical Conductivity (mS/cm)*
Pond	8.8	0.82
Ocean	8.3	5.50

Continued from page 15

every week or two with bagged sand from Florida. We use basic fertilizer and some plant growth regulators as needed. I tell the interns that the key to keeping a non-USGA

based rootzone pristine is to not get too fancy. Keep it simple, do what we do best: agronomics.

It takes a team to do it. You can have a plan on paper, but sometimes you have to

◀◀ The soil used for the putting green rootzones was obtained from the island. This local soil is frequently amended with sand to continue the process of improving the overall structure and function of the rootzone. This soil profile represents a 2-year-old putting green. Local island sand is screened to obtain the sand size needed, which is typical for working in the Caribbean — improvise, find creative solutions and do it all in-house.

PHOTO COURTESY OF: DAMON DI GIORGIO



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MARC MUNIZ
Director of Agronomy
The Golf Club at Lansdowne, Virginia

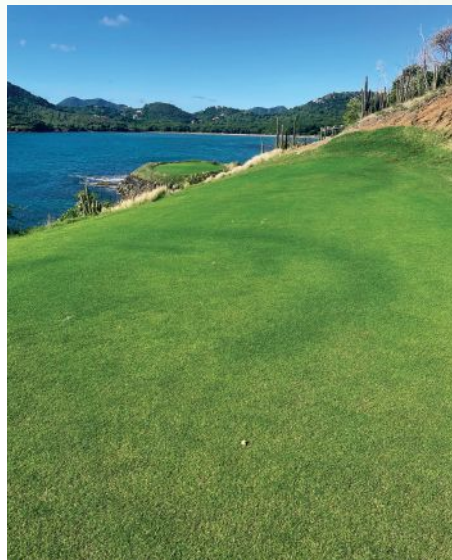


“

WHEN IT COMES
TO MAINTAINING
THE GREENS
HERE, WE KEEP IT
SIMPLE. ”

throw the book out and do what you know how to do best: water, fertilizer, sunlight. Sometimes it's not that complicated.

The advice I give to the interns is to network with people who are in similar circumstances. It's hard to tell your spouse, your partner or your friends who aren't in turfgrass about this job. They think we're playing golf all day. Calling my friends who are close by or far away and just telling them what's going on has always calmed me down. 



^ I made sure there were a couple of fairy rings for Fidanza — “Lord of the (Fairy) Rings.” The active type II fairy ring site has fungal mycelium near the surface, and the water droplet just sitting there is an indication of soil water repellency. Drying down the soil can trigger fairy ring activity. Excalibur soil surfactant is now being used to help maintain consistent and uniform soil moisture.

PHOTO COURTESY OF: DAMON D. GREGGIO

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From the Envu Green Solutions Team

Protect Turf From the Ground Up

Putting greens are among the most intensively managed turfgrass surfaces in the world. They're also the most vulnerable to stress. To meet expectations of the modern golfer, putting greens are mown short, irrigated and fertilized with minimal amounts and are often positioned in areas with insufficient sunlight and air movement – all factors that make them highly susceptible to root-infecting pathogens. Diseases including Pythium root rot, take-all root rot and summer patch can cause extensive damage that usually surfaces too late for corrective action.

Healthy Roots, Healthy Greens

Healthy roots are the foundation of healthy greens. When roots are compromised by pathogens, the turf struggles to take up water and nutrients and loses its ability to recover from stress. The challenge is that root diseases often develop silently. By the time symptoms like thinning or wilting are visible, significant damage has already occurred below the soil surface. This is why all university extension and Envu recommendations start with fungicide applications at the soil temperature thresholds known to trigger the first activity of the organisms causing root diseases. Those 2-inch soil temperature thresholds are 55° F for fairy ring, 60° F for Pythium root rot, 65° F for summer patch, and when temperatures dip below 85° F for take-all root rot. Resilia™ root health solution, Serata® fungicide and Tarvecta™ fungicide are excellent choices for these applications.

Resilia root health solution is designed to protect roots before problems start. Recent research and practical experience show that root diseases are often joining forces with other fungi, Pythium or nematode species to wreak havoc on your roots. With fluopyram, prothioconazole and propamocarb working together, it offers a broad defense against fairy ring, patch diseases, Pythium root rot and pathogenic nematodes. It's highly compatible with warm- and cool-season turf and fits easily into rotational programs for all root pathogens, which is especially important for resistance management.

Serata fungicide contains the active ingredient picarbutrazox and represents a new mode of action for golf course superintendents. Since its launch in 2022, Serata fungicide has quickly become the new gold standard against Pythium root rot. This disease can quickly decimate turf grown under wet and shady conditions, which underscores the importance of having Serata fungicide as the cornerstone of your Pythium root rot program. To achieve a broader spectrum of control while keeping an eye on managing resistance, consider tank-mixing Serata fungicide with Fame® fungicide or the newest fungicide from Envu, Tarvecta fungicide. Rotating this tank mix with Resilia root health solution creates a new standard (and an easy button) for root disease control.

Tarvecta fungicide is a dual-active fungicide that combines fluoxastrobin (QoI) and flutriafol (DMI). In addition to providing broad-spectrum control, the most unique advantage of adding Tarvecta fungicide into your fungicide program is the speed at which it works. Both fluoxastrobin and flutriafol are quickly taken up by the plant and rapidly translocated through the xylem. While applying fungicides preventively is always recommended, Tarvecta fungicide is an excellent choice for curative rescue sprays due to its ability to acropetally move throughout the plant and target all the places where fungi are colonizing. Tarvecta fungicide also has excellent seedling tolerance, making it a great fit for fairway overseeding or renovation programs.

Bottom Line: Build Resilience Below Ground

Protecting turfgrass roots is a cornerstone for effective putting green management. As superintendents know, strong roots drive everything from turf performance to turf recovery. Employing sound agronomic practices to grow healthy roots and protecting your hard-earned growth with Resilia root health solution, Serata fungicide and Tarvecta fungicide will help you confidently face summer stressors and consistently provide top-notch playing conditions.

Discover the full range of Envu turf solutions at us.envu.com/greenshealth, and scan the QR code to listen to our recent webinar on managing root diseases in turfgrass with Jim Kerns, Ph.D.



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BUGGING OUT

The value of a pest control professional

BY JARED OLSON, ACE

What superintendents should consider about pest control beyond the turf

When most superintendents think about pest issues on a golf course, they picture turf-damaging grubs or burrowing gophers. But as any seasoned superintendent knows, pest pressure isn't confined to fairways and greens. The entire course, from the clubhouse kitchen and 19th hole to the cart barn and maintenance shed, can be a haven for unwanted critters.

For superintendents, keeping a course beautiful, playable and safe means expanding their pest control lens beyond turf. Here are some tips on what to look for, how to spot the signs of pests early and how to partner with a pest control professional to protect your course, your guests/members and your reputation.



Jared Olson

How pests impact operations and reputation

Pests aren't just unsightly and annoying; they can threaten food safety and lead to unbudgeted expenses. Rodents can spoil bags of turf seed (a favorite food source) and lead to costly reseeding delays. Mice or roaches in food service areas create

Continued on page 22





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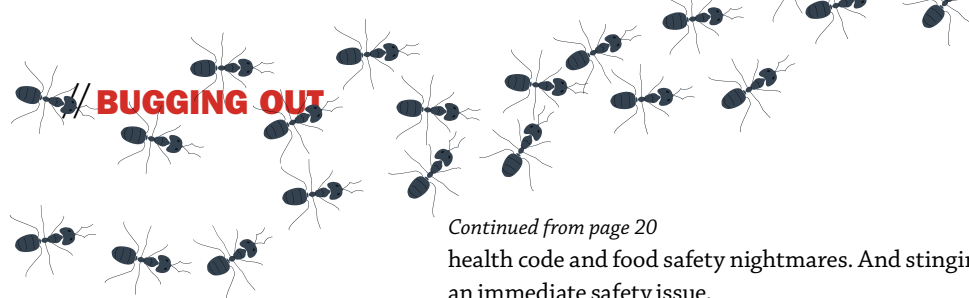
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Continued from page 20

health code and food safety nightmares. And stinging insect nests near paths or greens create an immediate safety issue.

During a routine service call to a golf course clubhouse, a Sprague technician was initially dispatched to investigate reported mouse activity in the bar area only to uncover another pest issue.

While setting snap traps beneath a sink cabinet to control the mice (which were entering through wall voids connected to an adjacent maintenance shed) the technician uncovered a more serious issue — German cockroaches.

Thanks to a sharp eye and a thorough inspection, the technician was able to trace the source of the cockroach activity and deliver a program to eliminate the infestation. By catching the issue early, Sprague helped the facility avoid a potentially widespread problem that could have impacted guest experience and food safety standards.

It's important to educate maintenance, clubhouse and kitchen staff to say something when they see something. Whether it's unusual noises inside a wall or spotting a cockroach, a culture of early reporting keeps small problems from becoming infestations.

Why DIY doesn't make the cut

Golf course superintendents already have enough on their plate. Trying do-it-yourself pest control, especially for high-risk pests like stinging insects, can create safety issues for golfers and crews and deliver less than desirable control results.

Pest control professionals have access to advanced tools, products and monitoring systems that go well beyond over-the-counter solutions. Their timing, application expertise and adherence to safety protocols are often worth more than the cost of service itself.

Choosing the right provider

Not all pest control companies are created equal. The lowest bid might save money upfront but cost more in recurring issues and liability. When choosing a pest control partner, here's what superintendents and club managers should look for:

Golf course experience. Pick a company that understands the unique environments of golf courses. Ask for referrals from other superintendents or club managers.

IPM-focused approach. Integrated Pest Management (IPM) is more than a buzzword. It means using environmentally responsible strategies to prevent pests before they become a problem. That includes sanitation, exclusion, monitoring and targeted treatments.

Detailed documentation. You should receive detailed inspection reports and service updates, ideally through a digital customer portal. Having all the details of your pest control program available will keep your entire team informed and in a proactive mindset.

Custom service plans. One-size-fits-all pest control doesn't work in an environment as dynamic as a golf course. Look for a provider who will assess your property's specific challenges and tailor their frequency, methods and pest targets to your needs.

Credentials. Ensure the provider is licensed, insured and holds certifications like QualityPro or GreenPro from the National Pest Management Association.

A proactive approach

Your course is a complex (and crowded) pest ecosystem. From maintenance shed and cart barn to food outlets and member locker rooms, every part of your operation is vulnerable to pest activity. By being vigilant, educating your team and working with a pest control partner who understands the golf course environment, you can protect not only your turf, but also your team, your guests and your brand. 

Jared Olson brings deep industry expertise to his role as the Phoenix branch manager of Sprague Pest Solutions. An Associate Certified Entomologist (ACE), Olson was nominated for the *Phoenix Business Journal's* 40 Under 40 for his leadership and impact and is a USGA member.

Non-turf pests to watch for



Golf courses offer pests a perfect trifecta — food, water and shelter. Remote locations, ample irrigation, seed storage, tree coverage and open dumpsters combine to make a golf course a year-round resort for everything from rodents to roaches.

Superintendents and their maintenance crews already walk the course daily, and with a few extra minutes and a better trained eye, they can spot pest issues early and get ahead of the issue. Here are a few pests common on golf courses and how to watch for signs of an infestation.

Rodents — Rodents are drawn to golf courses by dense vegetation, food waste from dining areas and stored materials like turf seed. They often nest in sheds, cart barns and equipment compartments, where they chew through wiring and insulation, posing fire and equipment failure risks.

Watch for signs such as droppings, gnaw marks, nesting materials in machinery, chewed irrigation lines or unusual engine performance, all of which may signal hidden rodent activity.

Cockroaches — German and American cockroaches thrive in clubhouse kitchens, bars, locker rooms, utility rooms and other areas with moisture and food waste. Turkestan and smokybrown cockroaches can be found in outdoor mulch beds, irrigation boxes and vegetation. Cockroaches hide in cracks and crevices, feeding on organic debris and breeding rapidly in warm, humid environments.

Superintendents should watch for signs such as shed skins, droppings resembling pepper flakes, musty odors and live insects scurrying when lights are turned on, especially near drains, appliances and storage areas. The presence of cockroaches pose sanitation and food safety concerns, and since they can reproduce rapidly, problems can quickly escalate.

Ants — While an often overlooked pest, ants can quickly establish expansive colonies in bunkers, tee boxes and other sandy or well-drained areas, compromising playability and aesthetics.

Species like pavement ants, Argentine ants and odorous house ants are common nuisances, while fire ants pose serious health risks with painful stings and aggressive behavior. Look for small mounds in turf, trails of foraging ants along hardscapes or clusters near irrigation heads.

Flies — A common issue on golf courses with outdoor dining and high foot traffic, flies are more than just a nuisance; they pose serious food safety and sanitation risks. They're frequently found around trash areas, restrooms, drain lines and beverage stations, where moisture and organic matter accumulate. House flies, drain flies and fruit flies are the usual culprits.

Signs of activity include adult flies hovering near entry points, larvae in drain lines or fly specks (tiny dark spots) on walls or equipment. Consistent monitoring and sanitation are essential to prevent breeding and protect the guest experience.

Stinging insects — Stinging insects including yellowjackets and wasps often build nests in ground burrows, sprinkler boxes, trees, wall voids and under eaves.

The aggressive nature of stinging insects, especially when nests are disturbed, poses a serious risk to those mowing, trimming or working near trees. Look for increased insect activity near structures, buzzing sounds around utility boxes or visible nests. Prompt identification and safe removal are critical to protecting both patrons and staff.

Mosquitoes — Mosquitoes thrive around ponds, water features and poorly drained turf, creating a persistent nuisance and potential health threat for golfers and maintenance crews. These pests breed in standing water and can quickly multiply if conditions go unchecked.

Beyond their irritating bites, mosquitoes can transmit diseases such as West Nile virus. Watch for swarms during early morning or dusk, especially near shaded, damp areas. Regular maintenance of drainage systems and standing water sources is key to minimizing their presence and protecting everyone on the course. **G**

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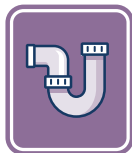
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// SUMMER TIME AND THE LIVIN' ISN'T EASY

IT'S SUMMER; TIME TO PREPARE FOR WINTER

By Mike Kenna

USGA Green Section Regional Updates are a great source of information provided by agronomists as they visit golf courses throughout the year. Jordan Booth, Ph.D., director of USGA Green Section, Course Consulting Service, is frequently asked to discuss disease management.

Overall, Booth lists several effective root *Pythium* fungicides on the market: Serata, Segway and Banol for bentgrass greens during hot, humid summer months. However, for golf courses in the Southeast with ultradwarf bermudagrass putting greens, August is the time to start thinking about upcoming winter dormancy.



Booth's treatment options below should be followed by 1/8 inch of irrigation.

- Treatments for take-all root rot should begin when average daily soil temperatures at the 2-inch depth drop below 86 degrees. The best programs for treating take-all root rot include DMI fungicides, and it is recommended that they be applied every 21 days until soil temperatures drop below 68 degrees.

- Treatments for spring dead spot should occur when soil temperatures drop below 70 degrees. The best programs for managing this disease include SDHI fungicides, and you should make at least two applications 28 days apart. A third application may be necessary if there is an extended fall season.

- *Pythium* root rot can occur year-round on ultradwarf bermudagrass. However, the most critical time to manage this disease is early August through November. Alternate applications of the most effective *Pythium* products with phosphonate fungicides for a robust *Pythium* program in the later summer and early fall.

Booth stresses that staying vigilant against soilborne diseases can make or break your year. This issue's Super Science research article provides up-to-date information on *Pythium* diseases provided by the University of North Carolina. 

References

Jordan Booth. 2023. Protect Your Investment in Root Health. USGA Green Section Record. 61(15).

NEWS UPDATES

ENVU ADDS NEW FUNGICIDE FOR SOILBORNE DISEASES

A new tool to combat soilborne diseases like fairy ring, summer patch and others is now available from Envu: Tarvecta.

The fungicide is a combination of fluoxastrobin and flutriafol. Envu says fluoxastrobin is taken up by the plant quicker than other strobis, while flutriafol moves faster than any other DMI up the xylem to internally control fungal growth and form a protective barrier.

"Diseases can establish quickly when turfgrass is stressed during peak playing times," says James Hemphfling, Ph.D., Green Solutions Team, Envu. "Disease damage disrupts playability. That's why preventative practices are crucial. Tarvecta can be applied proactively ahead of stressful periods to protect against infection or curatively to ensure rapid recovery."

For more information on Tarvecta, visit us.envu.com/plant-health.

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PRUNING OR REMOVAL OF TREES SURROUNDING PUTTING GREENS TO INCREASE SUNLIGHT PENETRATION AND AIR MOVEMENT WILL REDUCE *PYTHIUM* ROOT ROT ACTIVITY."

Lee Butler, M.S., and Jim Kerns, Ph.D.
(see story on page 27)

//STRATEGY SESSION

Pythium species management recommendations

By Lee Butler, M.S., and Jim Kerns, Ph.D.

Managing *Pythium* species is challenging, especially in the transitional climate zone where temperature extremes complicate disease timing and fungicide efficacy. The following are the current recommendations for managing *Pythium* blight, *Pythium* root rot and *Pythium* root dysfunction. The symptoms, development factors and cultural and chemical control are summarized.

PYTHIUM BLIGHT

Pythium blight first appears as small, sunken, circular patches up to one foot in diameter in cool-season turf during hot, humid weather. In warm-season turf, such as bermudagrass putting greens, *Pythium* blight first appears as small black or purple spots that can expand into larger irregular areas,

especially during prolonged periods of humid, rainy and/or cloudy weather any time of the year.

These symptoms can easily be mistaken for leaf spot, so be sure you obtain an accurate diagnosis. Leaves within affected areas are matted, orange or dark gray in color and greasy in appearance. Gray, cottony mycelium may be seen in the infected areas when the leaves are wet or humidity is high. The disease spreads rapidly along drainage patterns and can be tracked by equipment. This disease can cause widespread damage to a turf stand very quickly when conditions are favorable for development.

DEVELOPMENT FACTORS

Pythium blight may develop when night temperatures exceed 65°F in cool-season turf (50°F for warm-season

“Regardless of which fungicide is applied, effective curative control also requires increased mowing heights and nitrogen inputs.”

turf), and leaves are continually wet for 12 to 14 hours for several consecutive nights. For this reason, severe *Pythium* blight epidemics in cool-season turf are commonly observed the morning after a late afternoon or early evening thunderstorm in the summer. Daytime temperatures above 85°F also encourage *Pythium* blight development in cool-season turf, possibly

Continued on page 28

TABLE 1

Comparison of symptoms, development, management and chemical control for *Pythium* species on turfgrass.

<i>Pythium</i>	Symptoms and Appearance	Development Conditions	Cultural Management	Chemical Control	Turf Susceptibility
Blight	Rapid foliar disease with greasy, matted, dark-colored leaves; visible gray mycelium in humid conditions. Appears as small sunken patches or spots.	Develops during humid, wet conditions with night temps >65°F (cool-season) or >50°F (warm-season). Triggered by thunderstorms and lush foliar growth.	Focus on reducing leaf wetness, limiting nitrogen, improving drainage and equipment sanitation.	Preventative fungicides are applied during high-risk periods (14- to 21-day intervals).	It affects many turf types, but especially damaging to ryegrass and bluegrass; fast spread.
Root rot	Affects the roots, crowns, rhizomes and stolons. Causes yellow/orange irregular patches; roots appear greasy and dark with shallow root systems.	Requires prolonged soil saturation; can develop year-round. Driven by poor drainage, heavy rain and excess thatch.	Emphasis on improving drainage, removing thatch, increasing airflow and, in severe cases, reconstructing greens.	Preventive and curative fungicides, especially ethazole products, followed by systemic fungicides. All products must be watered in.	Can affect many turf types in persistently wet areas, prevalent on poorly drained greens.
Root dysfunction	Affects creeping bentgrass roots, especially on newer greens. Causes wilted, orange patches that collapse, primarily during heat/drought. Roots lack hairs and easily lose sand.	Infection occurs during cool seasons (50–75°F soil temps), but symptoms show in the summer heat (>85°F). Exacerbated by drought, low fertility and poor soil oxygen.	Requires managing soil structure (15% organic matter), maintaining fertility, raising the mowing height and frequent aeration/topdressing to improve oxygen.	Best controlled with a rotation of Serata/Resilia/Segway. Both curative and preventive programs are used.	Primarily affects creeping bentgrass on newer putting greens (<10 years old).

TABLE 2

Product trade names and active ingredients used to control *Pythium* species.

Trade Name and Formulation ¹	Active Ingredient
Heritage WG, TL, G	azoxystrobin
Heritage Action	azoxystrobin + acibenzolar-S-methyl
Headway ME, G	azoxystrobin + propiconazole
Compendium	azoxystrobin + propiconazole
Strobe T	azoxystrobin + tebuconazole
Teremec SP	chloroneb
Fame C	chlorothalonil + fluoxastrobin
Segway	cyazofamid
Union	cyazofamid + azoxystrobin
Koban or Terrazole	etridiazole
Resilia	fluopyram + prothioconazole + propamocarb
Stellar	fluopicolide + propamocarb
Fame	fluoxastrobin
Fame T	fluoxastrobin + tebuconazole
Signature or Signature Xtra Stressgard	fosetyl AI
Fore or Dithane	mancozeb
Subdue MAXX or Subdue G	mefenoxam
Navicon	mefentrifluconazole + pyraclostrobin
Serata	picarbutrazox
Appear II	potassium phosphite
Banol	propamocarb
Zio	<i>Pseudomonas chlororaphis</i> strain AFS009
Posterity XT	pydiflumetofen + azoxystrobin + propiconazole
Insignia WG, SC	pyraclostrobin
Honor	pyraclostrobin + boscalid
Lexicon Intrinsic	pyraclostrobin + fluxapyroxad

Continued from page 27

due to increased stress. Excessive soil moisture and succulent foliar growth also favor disease development.

Perennial ryegrass and annual bluegrass are most prone to *Pythium* blight and can sustain significant damage in two to three days if conditions are favorable. Creeping bentgrass and tall fescue are more resistant to the disease but can be severely affected if conditions are conducive for prolonged periods. Bermudagrass putting greens are susceptible to *Pythium* blight during extended periods of humid, rainy and cloudy weather most any

time of the year when temperatures are above 50°F.

CULTURAL CONTROL

Reduce prolonged leaf wetness by watering before sunrise in the early morning hours. Avoid excessive nitrogen rates to prevent lush, succulent foliar growth, which is very susceptible to *Pythium* blight. Cool-season turfgrasses should not be fertilized with more than 0.25 lbs. N per 1,000 square feet when conditions favor *Pythium* blight activity. Avoid establishing turf in low-lying areas that will collect water. If necessary, install subsurface drainage to prevent wet

soil conditions. Relieve compaction and maintain soil drainage through hollow tine aerification, and topdress golf course putting greens regularly to minimize thatch accumulations.

To minimize the pathogen's spread, do not mow or irrigate when *Pythium* mycelium is on the foliage. Collect and promptly dispose of clippings from infected areas and ensure that mowing equipment is washed before entering an uninfected area.

CHEMICAL CONTROL

Due to the potential for rapid development of this disease, high-value areas and susceptible grasses should be protected with a preventive fungicide program. Applications should be initiated when night temperatures consistently exceed 65°F for cool-season turf (50°F for warm-season turf) and repeated on 14- to 21-day intervals as directed on the fungicide label when conditions favor *Pythium* blight development.

PYTHIUM ROOT ROT

Pythium root rot is a persistent problem in poorly drained or over-irrigated areas. The disease can also occur in well-drained areas following extended periods of rainfall. *Pythium* root rot can occur at any time of the year if the soil remains saturated for several days or weeks. Symptoms are orange or yellow from a distance and usually appear in irregular patterns but occasionally develop in spots or distinct patches. Symptoms of *Pythium* root rot may spread in drainage patterns during heavy rainfall. The crowns, roots, rhizomes and/or stolons will appear dark and greasy on individual plants. The depth and density of roots will be drastically reduced in affected areas.

DEVELOPMENT FACTORS

Many species of *Pythium* can cause root rot in turfgrasses. As a result, if the soil remains saturated for prolonged

Continued on page 30

TABLE 3 *Pythium* blight

Fungicide and Formulation ¹	Amount of Formulation ²	Application Interval (Days) ³	Efficacy Rating	Resistance Risk	FRAC Code ⁴
Heritage			++	High	11
WG	0.2 to 0.4	10 to 14			
TL	2	10 to 14			
G	2 to 4 lbs.	10 to 14			
Heritage Action	0.2 to 0.4	10 to 14	++	High	11/P01
Headway			++	High	11/3
ME	3	14			
G	2 to 4 lbs.	14 to 28			
Compendium	2.6	14	++	High	11/3
Strobe T	0.75 to 1.5	10 to 21	++	High	11/3
Teremec SP	7	5 to 7	+	Low	14
Fame C	3 to 5.9	7 to 14	++	Medium	M5/11
Segway	0.45 to 0.9	14 to 21	++++	High	21
Union	2.9 to 5.75	14 to 28	++++	High	21/11
Koban	2 to 4.5	10	+	Low	14
Terrazole	2 to 4	10 to 14			
Stellar	1.2	14	++++	Medium	43/28
Fame	0.18 to 0.36	7 to 14	++	High	11
Fame T	0.45 to 0.9	21	++	High	11/3
Signature	4 to 8	14 to 21	+++	Low	33
Signature Xtra Stressgard	2 to 6	7 to 21			
Fore	8	10	++	Low	M3
Dithane	8	10			
Subdue MAXX	0.5 to 1	7 to 14	++++	High	4
Subdue G	12.5 to 25 lbs.	10 to 14			
Navicon	0.85	10 to 14	++	High	3/11
Serata	0.6 to 0.8	14 to 21	+++	High	U17
Appeal II	3 to 4	7 to 14	+++	Low	33
	4 to 6	14			
Banol	1.3 to 4	7 to 21	++	Low	28
Zio	1.8 to 6	7 to 21	+	Not known	BM02
Posterity XT	3	14	++	High	7/11/3
Insignia			++	High	11
WG	0.9	14 to 28			
SC	0.7	10 to 14			
Honor	1.1	10 to 14	++	Medium	11/7
Lexicon Intrinsic	0.47	14	++	High	11/7

¹ Other trade names with the same active ingredients are labeled for use on turfgrasses and can be used according to label directions.

² Units are oz, fl oz, or lbs., depending on formulation. Apply fungicides in 2 to 5 gallons of water per 1,000 square feet according to label directions. Use lower rates for preventive and higher rates for curative applications.

³ Use shorter intervals when conditions are very favorable for disease.

⁴ Fungicide Resistance Action Committee code. Products with the same code have the same mode of action and are in the same chemical class.

Efficacy Rating

++++ = Excellent control when conditions are highly favorable for disease development

+++ = Good control when disease pressure is high, excellent control when disease pressure is moderate

++ = Good control when disease pressure is moderate, excellent control when disease pressure is low

+ = Good control when disease pressure is low

? = Not rated due to insufficient data

Resistance Risk

Low = Rotate to different chemical class after 3-4 applications; tank mixing not necessary.

Medium = Rotate to different chemical class after 1-2 applications; tank-mixing with low or medium risk product recommended.

High = Rotate to different chemical class after EVERY application; tank-mix with low or medium risk product for EVERY application.

? = Not rated due to insufficient data

Continued from page 29

periods, root rot can develop at any time during the growing season. Poor surface or subsurface drainage, over-irrigation, heavy rainfalls and excessive thatch and organic matter accumulation are the most common factors that lead to a root rot outbreak.

CULTURAL CONTROL

Avoid establishing turfgrasses in poorly drained areas that remain saturated for extended periods. Golf course putting greens must be aerified and topdressed regularly to control thatch and reduce organic matter accumulation. Generally, 15 to 20 percent of the putting green surface area should be impacted by hollow-tine aerification annually, and 5,000 pounds of topdressing should be applied per 1,000 square feet each year.

Pruning or removal of trees surrounding putting greens to increase sunlight penetration and air movement will reduce *Pythium* root rot activity. Installing high-powered fans will also help alleviate the problem of restricted air movement. Reconstruction is the only practical long-term solution for golf course putting greens with poor internal drainage for *Pythium* root rot.

CHEMICAL CONTROL

Where this disease has been a persistent problem, apply labeled fungicides every 14 to 21 days during the growing season or when rainfall occurs for two to three consecutive days. For curative applications, first apply etridiazole, followed by an application of cyazofamid, picarbutrazox, mefenoxam, or propamocarb two to three days later. To minimize the potential for foliar burn, etridiazole must be watered in immediately after application with at least 1/8 inch of water. Other fungicides should also be watered in with at least 1/8 inch to drive the active ingredient into the root zone where the *Pythium* root rot pathogens are most active.

PYTHIUM ROOT DYSFUNCTION

Pythium root dysfunction is a disease caused by creeping bentgrass putting greens, and it is most damaging to greens constructed within the last 10 years. The pathogen infects bentgrass roots during the fall and spring and reduces their ability to absorb water and nutrients from the soil. Symptoms may appear at any time of year but are most severe during hot, dry weather. *Pythium* root dysfunction appears in circles or irregular patches up to two feet in diameter that initially show signs of wilt or nutrient deficiency.

As the disease progresses, affected areas turn orange and decline, eventually collapsing to the ground. Infected roots are tan in color and lack root hairs, which causes the sand to fall easily from the roots when examining a soil probe sample. Reductions in root depth may not be evident during the fall and spring, but roots infested with *Pythium* species associated with PRD die back rapidly when soil temperatures exceed 85°F.

DEVELOPMENT FACTORS

Pythium root dysfunction infects creeping bentgrass roots in the fall, winter and spring when mean daily soil temperatures are between 50°F and 75°F. Disease activity reduces the turf's ability to absorb water and nutrition from the soil and also leads to rapid root dieback when soil temperatures exceed 85°F. Therefore, the appearance of *Pythium* root dysfunction symptoms is enhanced by low fertility, drought stress and low soil oxygen levels. Symptoms are most common during hot weather in summer but may also appear during warm, dry conditions in fall, winter or spring.

CULTURAL CONTROL

To provide adequate water and nutrient-holding capacity, creeping bentgrass greens should be constructed with at least 10 to 15 percent organic matter by volume. After establishment,

Research Takeaways

- **Symptoms and Appearance:** *Pythium* blight is a foliar disease, while *Pythium* root rot or dysfunction are root diseases but differ in appearance and host specificity.
- **Development Conditions:** *Pythium* blight is driven by high humidity and leaf wetness, and *Pythium* root rot thrives in saturated soils at any time. *Pythium* root dysfunction infects bentgrass putting greens in cool temperatures but can show up under heat/drought stress.
- **Cultural Management:** *Pythium* blight targets leaf wetness, poor airflow and excessive nitrogen. Focus on water management and drainage for root rot, while root dysfunction on putting greens emphasizes soil structure, root zone oxygen and drought mitigation.
- **Chemical Control:** *Pythium* blight is mostly foliar-focused preventative applications, root rot is generally curative with a specific sequence of applications and root dysfunction requires precise fungicide classes and delivery to the root zone.

creeping bentgrass should be fertilized with 4 to 6 lbs. N per 1,000 square feet annually, depending on climatic conditions. Regular soil and tissue testing should ensure that all other nutrients are present adequately. Raise mowing heights to 0.125 inches during summer to increase photosynthesis and alleviate stress.

Avoid severe drought stress by irrigating before wilt symptoms become widespread and supplement with syringing and hand watering areas that dry out more quickly. Soil surfactants increase soil moisture uniformity across putting greens and assist with water management.

Plus, frequent cultivation and topdressing are needed to maximize oxygen levels in the soil. Generally, 15 percent to 20 percent of the putting green surface area should be impacted by hollow tine aerification annually, and 5,000 pounds of topdressing should be applied per 1,000 square feet yearly. Biweekly solid tine aeration during summer will increase root survival.

TABLE 4

Pythium Root Rot

Fungicide and Formulation ¹	Amount of Formulation ²	Application Interval (Days) ³	Efficacy Rating	Resistance Risk	FRAC Code ⁴
Heritage			++	Medium	11
WG	0.2 to 0.4	10 to 14			
TL	2	10 to 14			
G	2 to 4	10 to 14			
Headway			++	Medium	11/3
ME	3	14			
G	2 to 4 lbs.	14 to 28			
Compendium	2.6	14	++	Medium	11/3
Strobe T	0.75 to 1.5	10 to 21	++	Medium	11/3
Fame C	3 to 5.9	7 to 10	++	Medium	M5/11
Segway	0.45 to 0.9	14 to 21	++++	Medium	21
Union	2.9 to 5.75	14 to 21	++++	Medium	21/11
ethazole			+++	Low	14
Koban	4.5	10			
Terrazole	2 to 4	10 to 14			
Resilia	4	14 to 21	++	Medium	7/3/28
Fame			++	Medium	11
SC	0.18 to 0.36	7 to 10			
G	2.3 to 4.6 lbs.	7 to 10			
Fame T	0.45 to 0.9	21	++	Medium	11/3
fosetyl AI					33
Signature	4 to 8	14 to 21	+++	Low	
Signature Xtra Stressgard	2 to 6	7 to 21	+++	Low	
Navicon	0.85	14 to 28	++	Medium	11/3
Serata	0.6 to 0.8	14	++++	Medium	U17
Appeal II	6 to 8	7 to 14	+++	Low	33
Banol	1.3 to 4	7 to 21	+	Medium	28
Zio	1.8 to 6	7 to 21	++	Not known	BM02
Posterity XT	3	14	++	Medium	7/22/3

¹ Other trade names with the same active ingredients are labeled for use on turfgrasses and can be used according to label directions.

² Units are oz, fl oz, or lbs., depending on formulation. Apply fungicides in 2 to 5 gallons of water per 1,000 square feet according to label directions. Use lower rates for preventive and higher rates for curative applications.

³ Use shorter intervals when conditions are very favorable for disease.

⁴ Fungicide Resistance Action Committee code. Products with the same code have the same mode of action and are in the same chemical class.

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? = Not rated due to insufficient data.

Resistance Risk

Low = Rotate to different chemical class after 3-4 applications; tank mixing not necessary.

Medium = Rotate to different chemical class after 1-2 applications; tank-mixing with low or medium risk product recommended.

High = Rotate to different chemical class after EVERY application; tank-mix with low or medium risk product for EVERY application.

? = Not rated due to insufficient data.

Continued on page 32

TABLE 5

Pythium Root Dysfunction

Fungicide and Formulation ¹	Amount of Formulation ²	Application Interval (Days) ³	Efficacy Rating	Resistance Risk	FRAC Code ⁴
Heritage			++	High	11
WG	0.4	21 to 28			
TL	2	21 to 28			
Heritage Action	0.4	21 to 28	++	High	11/P01
Segway	0.45 to 0.9	14 to 21	+++	High	21
Union	5.75	21 to 28	+++	High	21/11
Fame			++	High	11
SC	0.27 to 0.36	14 to 28			
G	1.6 to 4.6 lbs.	14 to 28			
Fame C	4.5 to 5.9	14 to 28	++	High	11/M5
Navicon	0.85	14 to 28	+++	High	3/11
Serata	0.6 to 0.8	21 to 28	++++	High	U17
Posterity XT	3	21 to 28	++	High	7/11/3
Insignia			++	High	11
WG	0.9	14 to 28			
SC	0.7	14 to 28			
Honor	1.1	14 to 28	++	High	11/7
Lexicon Intrinsic	0.47	14 to 28	+++	High	11/7

¹ Other trade names with the same active ingredients are labeled for use on turfgrasses and can be used according to label directions.

² Units are oz, fl oz, or lbs., depending on formulation. Apply fungicides in 2 to 5 gallons of water per 1,000 square feet according to label directions. Use lower rates for preventive and higher rates for curative applications.

³ Use shorter intervals when conditions are very favorable for disease.

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Efficacy Rating

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++ = Good control when disease pressure is moderate, excellent control when disease pressure is low.

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? = Not rated due to insufficient data.

Resistance Risk

Low = Rotate to different chemical class after 3 to 4 applications; tank mixing not necessary.

Medium = Rotate to different chemical class after 1-2 applications; tank-mixing with low or medium risk product recommended.

High = Rotate to different chemical class after EVERY application; tank-mix with low or medium risk product for EVERY application.

? = Not rated due to insufficient data.

CHEMICAL CONTROL

Standard *Pythium* fungicides, such as mefenoxam (Subdue Maxx) and propamocarb (Banol) have provided poor to moderate control of *Pythium* root dysfunction when applied alone. The most effective fungicides in recent trials at NCSU have been picarbutrazox (Serata), cyazofamid (Segway) and fluopyram/prothioconazole/propamocarb (Resilia).

Fungicides may be used on either a curative or preventative basis for *Pythium* root dysfunction control. Both strategies employ the same fungicide rotation with all applications watered in immediately with 1/8 inch

of post-application irrigation:

1. Serata (0.6 fl oz per 1,000 square feet)
2. Resilia (4 fl oz per 1,000 square feet)
3. Segway (0.45 fl oz per 1,000 square feet)

Serata should be applied for preventative control every 21 to 28 days in the fall and spring when mean daily soil temperatures are between 50°F and 75°F. Curative applications should be made every 14 to 28 days based on the appearance of symptoms. In recent trials, we have not observed significant differences among QoI fungicides when used alone for *Pythium* root dysfunction. Regardless of which fungicide is applied, effective curative control also requires increased

mowing heights and nitrogen inputs to relieve stress and allow the affected plants to heal. **©**

Source: Jim Kerns and Lee Butler, NC State University Extension, Turfgrass Diseases. *Pythium* blight, *Pythium* root rot and *Pythium* root dysfunction. Last updated 2025.

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“The bluish wilt stage for annual bluegrass, from my experience, lasts about five seconds before it rapidly enters drought.”

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

An annual bluegrass summer

The period from late May to early June results in an interesting change in annual bluegrass growth and, indirectly, its management. Through May, annual bluegrass (*Poa annua*) has the ability to flower and produce seed under low mowing heights.

During the period of profuse seed-head production, annual bluegrass uses up to 35 percent of its top growth based on dry matter for seed production. The annual seed production on a golf green is between 150,000 to 650,000 seeds per meter squared per year (177,000 to 767,000 seeds/square yard/year). Almost all of the seed is produced through the period of May through June.

The seed that is produced contributes to the soil seed bank. Some annual bluegrass may germinate quickly, which is referred to as a transient seed bank, but normally this would occur where summers are mild like the very northern United States. Most of the seed produced enters the seed bank and remains dormant. For the seed to germinate, an after-ripening period is needed. In the case of annual bluegrass, its seed requires a period of high summertime temperatures to trigger its germination in late summer.

An important aspect in managing annual bluegrass in the summer is coring, normally with small or quadrates, to relieve surface compaction and allow for oxygen exchange into the root system. The requirement of the annual bluegrass seed bank to undergo an after-ripening period greatly reduces the potential for seed to germinate in the core-opened areas.

It's important to note that small-tine coring relieves surface compaction, but after annual bluegrass has completed most of its flowering stage, there is a loss of a deep significant root system. The amount of energy that annual bluegrass spends to produce inflorescences, and thus seed, comes at the expense of root development and growth.

The image of annual bluegrass as it moves into the summer months is a plant that has a restricted or shallow root system, especially on compacted soils. Combine a restricted shallow root system with summertime tempera-

tures, then add in thunderstorms generating inches of rain, and the result is annual bluegrass that will rapidly die. The saturation of the soil profile results in insufficient oxygen levels.

Often mottled or chlorotic annual bluegrass turf symptoms occur because not enough energy is being produced by the plant to actively take up water and nutrients. This condition is called 'wet wilt' and is most often associated with annual bluegrass.

Specific keys to managing annual bluegrass is through proper water management. Recognizing the changing growth habit (restricted root system), watering needs to be adjusted. Allowing creeping bentgrass, for example, to undergo wilt (bluish tint) prior to applying water would not be successful with annual bluegrass. The bluish wilt stage for annual bluegrass, from my experience, lasts about five seconds before it rapidly enters drought.

Regarding top growth, annual bluegrass aggressively tillers under optimum growing conditions found in spring. As summer approaches and conditions become less favorable for growth, new tillers are produced, but not nearly at the rate when conditions are favorable. Research has found that slowing senescence is targeting pests, specifically pathogens through fungicide programs. Critical in maintaining an annual bluegrass turf is a well-designed disease control program.

The growth of annual bluegrass rapidly changes as the season moves into summer. A key to its management is recognizing the changing nature of annual bluegrass. Given that most of the changes are relatively negative in nature, it is critical for superintendents to stay on top of their annual bluegrass management programs. **G**

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



“... The initiative is a challenge and commitment, not a mandate, and aims to help golf courses use less water through existing and new strategies.”

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

Past, present and future of USGA research

For an April USGA Green Section podcast, John Petrovsky, the host and education manager, interviewed Cole Thompson, Ph.D., research director, and me about the past, present and future of turfgrass and environmental research and how superintendents can apply research findings. You can listen to the entire podcast, “What can we learn from 100 years of Green Section Research,” online. The topic was selected to celebrate Earth Day.

I provided a historical overview of the Green Section, starting with Charles Piper and Russell Oakley’s USDA work in the early 1900s. I noted their 1917 publication, *Turf for Golf Courses*, and the establishment of the Green Section in 1920. Piper collected grasses worldwide, including many *zoysia* and *agrostis* species. The Green Section changed from a USDA program to one within the USGA after World War II, led by Fred Grau, Ph.D., and subsequently focused on university research grants.

The turfgrass research program was reinvigorated in 1982 due to national drought concerns and the significant cost increases in managing golf courses. A research committee was formed, and the first projects were funded in 1983 and 1984. Some early projects included stress physiology, breeding, disease management and the Turfgrass Information File (TGIF).

Later, environmental research was integrated in the 1990s, culminating in the turfgrass and environmental research program.

Cole explained the current structure of the USGA’s research program, which includes a research committee of external scientists and USGA staff. The committee sets research priorities and selects proposals, with funding primarily coming from the U.S. Open. He also mentioned the 15-30-45 water conservation initiative and a partnership with the R&A and STERF to fund international research.

I summarized the environmental research conducted in the 1990s, focusing on the fate and transport of pesticides and fertilizers. This research addressed concerns about the environmental impact of golf courses and convinced the EPA that golf courses were not as harmful as initially pre-

dicted by agricultural models. By 1994, data showed that turfgrass systems performed well in mitigating chemical impacts, leading to a symposium at the American Chemical Society in 2000.

Cole discussed current environmental projects, including a Purdue University project focused on converting naturalized areas into wildlife conservation habitats. He highlighted the importance of monitoring pollinator abundance and creating resources for superintendents. He also mentioned the Natural Capital Project, which compared golf courses to other land uses, and collaborations with organizations like the U.S. Fish and Wildlife Service and EcoAdapt to improve golf course habitat and address perceived climate risks of golf courses.

Cole returned the discussion to the 15-30-45 water conservation initiative, a \$30 million investment over 15 years to reduce water use by up to 45 percent. He emphasized that the initiative is a challenge and commitment, not a mandate, and aims to help golf courses use less water through existing and new strategies. He described the *USGA Water Conservation Playbook*, which includes foundational practices like water budgeting and irrigation system optimization.

Looking ahead, I expressed excitement about remote sensing and data-driven decision making, while Cole emphasized the importance of technology that provides efficient data streams and outcome-based management. We both agreed on balancing technological advancements with fundamental agronomic principles.

The podcast is roughly an hour long, so if you have some time to kill on a mower in the near future, I’d recommend searching for “What can we learn from 100 years of Green Section research” and take a listen. 🎧

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

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2025 CONFIRMED PARTNERS (AS OF MAY 1ST)



The 19th Hole

Max Major

SUPERINTENDENT // Rutland (Vt.) CC



Max, what are you having? A Miller Lite. I'm a cheap date.



Tell me about Rutland

CC. We're an 18-hole semi-private golf club. I always refer to the course as "old school golf." It originated in 1901, and it's 6,300 yards. It's a smaller property with a lot of unique green complexes and a lot of slope. We're known for fast greens. It's a Stiles and Van Kleeck design; it's got a lot of great sister courses in the area that are well known. It's a beautiful golf course.

How did you get into the business?

I got into it from the playing side. I've played golf my entire life. I had a great college career playing, and then I ended up coaching at the University of Connecticut for a couple years. I did grow

up on the grounds crew; that was my initial break-in. I grew up rolling greens starting at the age of 15. COVID kind of got me out of coaching; I moved back home and, four years later, I'm the superintendent at my home club.

What teams do you root for? I'm from Vermont, so obviously I'm a Boston fan — Bruins, Pats and Sox. I'm a hockey player, so I'm a big Bruins fan.

What is your all-time golf highlight?

My personal highlight was probably shooting the course record in the State Am in 2020 at Stowe (Vt.) CC. I shot 12-under 60 with my brother on the bag. It was an insanely unique day. Everything was disappearing, it didn't matter if it was five feet or 25 feet.

Does that record still stand? It still does, and they just demolished the course, so that record will never be broken!

If I'm back in your area, what is something I've got to do?

Remember, I'm not a skier. There's plenty to do here. We're at the base of Killington Mountain. Vermont is getting more well known for its breweries. There's a lot of craft beer here. There are brewery tours, hiking, fishing ... the summers are beautiful; there are a lot of outdoor activities in Vermont.

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Tell me about your family and what do you do for fun? I'm getting married in September. Brittany is the general manager of the clubhouse at the same facility, so our lives are pretty crazy — we had to plan the wedding around the golf course schedule. And my family is all local. Sammy is my brother, we're super close. We all go to Key West every February as a family. That's our family trip; that's what I enjoy the most.

As interviewed by Seth Jones, May 16, 2025.

// BEST ADVICE

"THE BEST ADVICE I WAS GIVEN IS THAT THERE'S ALWAYS TIME FOR SOMETHING. IF YOUR GAME PLAN FOR THE DAY DOESN'T WORK OUT, CALL AN AUDIBLE AND MAKE NEW PLANS. ALWAYS GET SOMETHING DONE."



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