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T

2022 WERE NOT THE CLUB

In memorian: Jeff Higgins, Ph.D.

05.22

Dave Johnson, director of grounds at The Country Club, Brookline, Mass., is ready for the 2022 U.S. Open

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Steeped in history, Dave Johnson, director of grounds at The Country Club, and crew prepare to host the 2022 U.S. Open

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Keeping up with **The Jones**



"If I can find a way to have a bad day fishing, is it possible for me to have a bad trip to the Masters? Let's find out ..."

SETH JONES, Editor-in-Chief & Associate Publisher

LOOKS LIKE RAIN

A bad day at the Masters?

here's a saying that there's no such thing as a bad day fishing, but I've successfully challenged that trope. My bad day fishing included a hooked pelican, a hooked gar that our one-armed fishing guide beat the hell out of to unhook, way too much political chit-chat for any relaxation and finally, a mid-morning storm that not only drenched us but also signaled the end of any bites.

If I can find a way to have a bad day fishing, is it possible for me to have a bad trip to the Masters? Let's find out ...

My 2022 Masters experience started out with an unexpected treat: watching my Kansas Jayhawks overcome a 15-point halftime deficit over the University of North Carolina Tarheels in the NCAA Men's Basketball Championship. I told everyone at our rented house in Augusta, Ga., that going from your team winning a national championship one day to attending the Masters the next is a sports fan's dream come true.

The next morning, we arrived at Augusta National, my first time on the course since the 2019 Masters. It never occurred to me back in April of 2019 that a global pandemic might keep me away for the next two years. I wrote it a few months ago, and I'll repeat it here: being back at Augusta National was not something I would take for granted.

With bad weather in the forecast, we quickly made our way to Amen Corner for a few photos. Then we went through the chaos of the golf shop to fulfill all our friends' Masters wish list items. We hustled back onto the course for our Friends of *Golfdom* meeting at 11 a.m.

Then, boom! The horn sounded at 11 a.m., and we had to clear the course. The sky opened up the rest of the day, ending our Masters experience on Tuesday almost as soon as it began.

On Wednesday, we got back on the course early, again fearful of a forecast for bad weather. And once again, the horn sounded shortly after 11 a.m., just as I was buying a round of drinks for that day's Friends of Golfdom meet-up. Between that morning's Golf Writers Association of America annual meeting and choosing the wrong line for concessions, it felt like I barely saw any golf. As we walked off the property, people driving into Augusta National rolled down their windows and asked us, "Why are you walking away?" We were the bearer of bad news to those just rolling in. Sorry

folks, the course is closed; the moose outside should have told you.

This time, the sun kept shining and, within about two hours, they reopened the course. We scrambled back in and made our way to the par three tournament just in time for ... the horn to sound again. My 2022 Masters experience was over.

As we walked away from the course, my friend and Golfdom Western Regional Sales Manager Jake Goodman looked at me and said, "Dang, Jones ... you must have used up all your good karma on that Jayhawks comeback!" "I'm 100 percent good with that, Goody," I responded. The Jayhawks were still national champions, and even though it was cut short, I was still able to see Augusta National in person again.

A quick look at our Golfdom Gallery section (pages 10 and 11) shows that despite being cut short, we still packed in a lot in our three days in Augusta. We saw Tiger. We saw old friends. We met readers. We held a backyard barbecue with our cohorts from Quali-Pro. I heard stories from superintendents on topics ranging from the golf boom brought on by the pandemic to tales of working at some of the finest golf courses in the world. I got to tell a few of my own stories, too and I even made a few new friends.

A bad trip to the Masters? I don't think it's possible. **G**

Email Jones at: sjones@northcoastmedia.net.



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Jeff Higgins, Ph.D., with his wife, Stacy. "Doc Ho" was famous for many things, including his Hawaiian shirts.

BY GOLFDOM STAFF

It is with great sadness that Golfdom reports on the unexpected passing of Jeff Higgins, Ph.D., in mid-April.

Higgins was most recently the business development manager for Simplot Partners. Higgins also spent time as the director of marketing for Pursell Technologies, where he was an integral part of the FarmLinks Experience. He served as director of agronomy for ValleyCrest Golf Course Maintenance as well as vice president of business development and strategic accounts for Harrell's.

Higgins was affectionately nicknamed "Doc Ho" because of his many Hawaiian shirts, like musician Don Ho. Higgins had a personality as bright as those shirts.

"Jeff was regarded as one of the giants of the turfgrass industry," said

Bert McCarty, Ph.D., professor of turfgrass science, Clemson University, in a tribute posted on YouTube. "What really impressed me most about Jeff was his high intellect and quick wit. Jeff brought to the table, which is very rare, a combination of a high personal intelligence as well as a grand personality."

"I still remember the first time I met Jeff after his presentation at Farm-Links back in the early 2000s," recalls Seth Jones, *Golfdom* Editor-in-Chief. "It was just as informational as it was entertaining. Doc engaged with everyone in the room and made everyone there feel important. His intelligence was offthe-charts, but so was his kindness."

Higgins had a B.S. in Plant Protection and Integrated Pest Management from Auburn University, an M.S. in Weed Science from Auburn University and a Ph.D. in Agronomy and Soils, Weed Science from Clemson University.

//BUSINESS DISCUSSION SBI BACK IN-PERSON

Back in person again, Syngenta is now accepting applications for the 2022 Syngenta Business Institute (SBI) professional development program for superintendents. The program returns to the Graylyn International Conference Center in Winston-Salem, N.C., on Dec. 6-9.

"Two years of virtual SBI certainly exceeded our expectations, but we are really excited about the idea of being back in person for the 2022 program," Stephanie Schwenke, turf market manager for Syngenta, said.

SBI partners with Wake Forest University for the program curriculum, which features educational courses designed to teach superintendents critical industry skills. Upon completion, participants will earn 1.5 GCSAA education points. Candidates must fill out an application that includes a short essay on why they should attend and submit it online by Aug. 23. To apply, visit GreenCastOnline.com/SBI.

//STAY IN YOUR LANE, BRO

LEGISLATION VIES TO LIMIT LOCAL PESTICIDE BANS

Rep. Rodney Davis (R-III.) introduced legislation to prohibit local governments, such as municipalities, townships or counties, from banning or regulating the use of pesticides at levels that are more stringent than state and federal regulations.

"Pesticides serve as important tools for our farmers, pest management, landscape professionals and many others," Davis said. "These products are already rigorously regulated at the federal and state levels to ensure safety."

Davis' legislation clarifies in the federal statute that regulation of pesticides will be handled jointly by the lead regulatory agency in each state and the U.S. Environmental Protection Agency (EPA). It will also ensure the uniform labeling of pesticides.

"This legislation will take long-awaited steps to promote a regulatory environment based on consistency and predictability to ensure that pesticides are safe, effective and accessible," Congressman Jim Baird (R-Ind.) said. "I look forward to working with my colleagues to promote a science- and risk-based regulatory environment for critical agricultural inputs."

//GOING THE DISTANCE

USGA provides update on distance; research grants

The USGA and the R&A released the Distance Insights Reports for 2020. The Distance Insights Project started in 2018 to provide a review of hitting distance in golf.

The report showed that longer courses have adverse consequences that affect golfers of all levels. One of the key findings went outside the playing of the game: lengthening or toughening courses has a negative effect on environmental and ecological issues, the report states. The governing bodies have also researched how course-related factors such as setup, conditioning and maintenance could be used to impact the way a course plays.

In other USGA news, the association announced the allocation of \$1.9 million in research grants for 2022.

The grants will fund more than 80 research projects through the Mike Davis Program for Advancing Golf Course Management.

Notable projects being funded in 2022 include a national, multiuniversity evaluation of drought tolerance and water use of grasses commonly used for fairways; a Texas A&M project that aims to reduce fertilizer use with site-specific, digital estimates of nutrient requirements; and turfgrass breeding programs at several universities that are improving the quality, stress tolerance and resource-use characteristics of important turfgrasses.

For the complete Distance Insights Report and more on the research grants, visit USGA.org.

...

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Dan Grogan @purdueturfy Superintendent, The Sagamore Club, Noblesville, Ind.

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Ask Thad BY THAD THOMPSON

Superintendent Terry Hills GC, Batavia, N.Y.

Do you have any tips for bringing on new employees and making them feel welcome that have proven successful?

When I was younger, I thought being a superintendent was all about how good you were at growing grass. I received good grades in turf school but was never taught how to be a leader in a classroom setting. Grass growing is a very important part of our jobs but look at it this way, you may be the best grass grower of all time, but if you can't teach others your methods and have them implemented, you will never be successful. I've never met a superintendent who can maintain an entire golf course alone.

When I think of the best superintendents that I know, several things stand out. Their demeanor exudes confidence. There is a plan, whether it be long-range, for a season or the day. They clearly communicate their instructions and expectations for any job they give. Sadly, I haven't worked for most of them, so like most people in golf course maintenance, I have had to develop my own approach.

I spend more time with my crew during the season than I do with my family. Granted, I'm divorced with two kids in their 20s who are out of the house, but you get my point. During the season, a golf course maintenance crew functions like a family with many of the same joys, disagreements, successes and pressures. I never give any employee a job that I'm not willing to do myself. I enjoy working out with my crew on any job and always try to take a hands-on approach to teaching. I personally fix any irrigation problem that arises, whether it be hydraulic or electrical, so everyone sees me kneedeep in the mud. I listen to everyone and try to match personalities as we hand out work assignments. I'm approachable, and every time I see one of my crew outside of work and am introduced as their boss, I always say, "We work together," and I mean it. Being a leader and being a boss are two very different things.

Got a question for Thad? Tweet to @TerryHillsMaint and @Golfdom or emailThad at thadthompson@terryhills.com MASTERS



DJ with the rescue Patrons at Augusta National GC, Augusta, Ga., got an up-close look at Dustin Johnson, 2020 Masters champion.

Golfcon

Friends of Golfdom Jed Fedor (left), superintendent at The Cliffs at Mountain Park, Asheville, N.C., with the Shands, Trish and Steve. Trish is the membership and communications director at Biltmore Forest CC, Asheville, while Steve is the superintendent at The Cliffs at Walnut Cove in Asheville. Check out page 40 for our 19th Hole interview with Steve.

Dinner guests Mark Jordan, CGCS, Natural Resource Leader, Westfield CC, Westfield Center, Ohio, with Robert Trent Jones II at the 2022 Golf Writers Association of America annual dinner.

Cam pays off After winning at TPC Sawgrass, Aussie Cameron Smith was a popular choice in our Masters Pick'Em contest. Winner Jay Neunsinger, superintendent at Richmond (Calif.) CC, had him in his foursome.

Backyard barbecue Take our advice: if there's a grill nearby, allow Quali-Pro's Allan Fulcher (center) to spark it up. Left to right are Miles Carlson, superintendent at Grand Pines GC in Montgomery, Texas; Mike Carlson, CGCS-Retired; Mike Daugherty, Quali-Pro; Paul Blodorn, Quali-Pro; Fulcher; Seth Jones, *Golfdom*; Steve Loughran, Pomperaug GC, Southbury, Conn.; Bryan Truszkowski, PGA Professional at Candlewood Lake Club, New Millford, Conn.; and Craig MacGregor, *Golfdom*.

Seeing red again Jones changed his wardrobe selection after his Jayhawks won the national championship on the Monday night of Masters week — and he was easy to spot with that bright red Jayhawks jacket. With Jones is Jon Maddern, CGCS, Club Corp. Maddern was president of GCSAA in 2003.

Luck of the Irish Irishman Shane Lowry takes a rip at the risk-reward par five No. 13 at Augusta National.

















Rain delay The guys did a good job forcing smiles here because this photo was taken minutes after the horns sounded to evacuate Augusta National for severe weather. From left to right are Rich Sweeney, the Plant Food Co.; Daugherty; Blodorn; MacGregor; Joe Kinlin, superintendent, Bey Lea GC, Toms River, N.J.; and Jake Goodman, *Golfdom*.

Boston boys We just saw these guys last fall at Fenway Park, then we ran into them again in Augusta. From left to right are Nick Burchard, Nutrien Ag Solutions; John LeClair, superintendent, Poquoy Brook GC, Lakeville, Mass.; Jones; Bill Coulter, Montaup CC, Portsmouth, R.I.; and Drew Cummins, Nutrien Ag Solutions.

Family road trip Miles Carlson, superintendent at Grand Pines GC in Montgomery, Texas, with his uncle, Mike Carlson, CGCS-Retired, on No. 18 at Augusta National.

Masters debut Australian Cameron Davis made his Masters debut this year, earning an invitation after winning the Rocket Mortgage Classic in 2021. Davis made the cut and finished at 12-over.

Old Dominion past presidents What do these men all have in common? They all are past presidents of the Old Dominion GCSA. They're all in the golf maintenance industry. They all read Golfdom. And they all think they're the best golfer in the group. From left to right are Paul Van Buren, The Kanawha Club, Manakin-Sabot, Va.; Jay Wade, Magnolia Green GC, Moseley, Va.; Ryan Dwyer, The Club at Viniterra, New Kent, Va.; Brent Graham, CGCS, Two Rivers CC, Williamsburg, Va.; Jeremy Waddell, Golden Horseshoe GC, Williamsburg, Va., and Chris Roberts, Landscape Supply, Midlothian, Va.



Musings from the Ledge /



"If nothing else, the GCSAA has raised the professionalism of our industry. When I first came to Penn State in the mid-1990s, superintendents and greenkeepers were more closely regarded as Carl Spackler rather than as a professional."

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

Get involved or stop criticizing

ver the years, I've been lucky to be invited to sit on several Golf Course Superintendents Association of America (GCSAA) committees.

As a young superintendent, the local association sent me to the mothership for a meeting, and my involvement grew from there. The pandemic threw us all into a new world. Kudos to Rhett Evans, the board and all of the GCSAA staff for pushing through it and getting back to an in-person San Diego show, although it also brought back the annual criticism of "what do they do for me?"

It's funny; even though I've been there enough to know that answer, I struggle when someone asks because, like all-important work, it hides in the background, silently supporting the main cast, the superintendents.

Through my involvement with the national and local associations, I know what goes on behind the scenes. It's easy to say I drank the proverbial GCSAA Kool-Aid. It's similar to criticism that regularly pops up about the compensation report only providing updates on "the big clubs" and making it skewed. If that's the case, why are those complaining not providing info to unskew it?

Change the perception

It's like anything in life, the more you put in and get involved, the more you get back. At the end of the day, it comes down to being a part of something that helps change perceptions of what we do and how important greenkeepers are to a facility. Initiatives like the First Green connect us with people who have never seen or considered golf, which grows the game but also gives us a stage to show people how we really are stewards of the environment and how much fun the kids have. They give us a single voice on regulatory stuff. I don't want to know what would have happened if the waters of the United

States (WOTUS) bill had passed. While the GCSAA didn't prevent this on its own, it gave the industry a voice in a larger group that was able to get it done.

DON'T CALL ME CARL

How it works

The big show works and brings everyone to one place. The vendors can focus on one event to pay for, and, more importantly, there will not be a case of one show stealing from another. The local shows work on a smaller scale, largely for the local distributors to do the exhibiting, leaving the manufacturers to float the big event and new product launches. As the virtual show last year showed, this is not broken. These events bring us together for networking and camaraderie, although social media has also made that easier. I still like meeting people one-onone and learning from their

different insights and perspectives, as well as hearing that a lot of our struggles are the same.

If nothing else, the GCSAA has raised the professionalism of our industry. When I first came to Penn State in the mid-1990s, superintendents and greenkeepers were more closely regarded as Carl Spackler rather than as a professional. Our pay has gone up. If someone says it does not apply to them, at least the data is there to approach the powers that be and start a conversation.

Head of the table

Overall, superintendents are now considered the most important person at a facility when, not so long ago, it was the pro. Look at Tour events on TV; they are not talking to or about the club pro but rather to the superintendent and about the course conditions. All you have to do is look at other countries that have not got there yet to see the superintendent is still treated as the dirty guy in the shed at the back of the course.

Of course, there is much more, but I am limited here on space. The GCSAA (and British and International Golf Greenkeepers Association, while we're at it) do a lot for our industry, but they only work if we support them. Get involved or stop criticizing, and if nothing else, get out and meet some new people in person and help shape the future of the industry. **G**

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

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Dave Johnson, director of grounds at The Country Club, and his crew have their historic course ready for its fourth U.S. Open in the 140-year history of the club. T

PHOTO BY: JASON PAIGE SMITH PHOTOGRAPHY



It's all in the name

Steeped in history, Dave Johnson, director of grounds of The Country Club and crew prepares to host the 2022 U.S. Open

BY SARAH WEBB

f the greens at The Country Club could talk, boy, they'd have some stories to tell. With a name like The Country Club, the historical significance of the course stands on its own.

"This place is so rich in history," says Dave Johnson, director of grounds. "I love when you pull into the property. It feels like stepping back in time. I never take it for granted."

Founded in 1882 and located in Brookline, Mass., The Country Club is one of the oldest clubs in the U.S. and is one of five charter members that founded the United States Golf Association (USGA) in 1894. It has played host to 16 USGA national championships, including the 1913 U.S. Open, won by amateur and Brookline-native Francis Ouimet, which began the golf boom in America and inspired the book and film "The Greatest Game Ever Played."

The 1999 Ryder Cup featuring the U.S. team's gripping Sunday comeback and three U.S. Opens (1913, 1963 and 1988), all finishing in playoffs, were also played at the historic venue.

Continued on page 16



Continued from page 15

Set to write the next chapter as host of the 2022 U.S. Open, the team at The Country Club, led by Johnson, nods to the club's storied past while keeping an eye on the horizon for what's to unfold for the 2022 championship from June 16 to 19.

Back up to par

Of course, a lot of work has gone into restoring the course to its former glory.

"I know some of the golfers were probably there for the 1999 Ryder Cup, but a lot of these players have never even stepped foot on this property," says Adam Bennett, grounds superintendent. "A lot of the undulations, the blind shots, are probably going to be pretty challenging to them. The routing is completely different than anyone has ever played or seen."

Johnson tapped into his past experiences and passion for the industry to make it happen. He served as superintendent at Wianno Club in Osterville, Mass., from 2014 to 2018, which immediately followed a 10-year stint in the same capacity at Whitinsville (Mass.) Golf Club and work as an assistant at Wachusett Country Club in West Boylston, Mass.

He always harbored a love for the outdoors, but a passion for



The Country Club will host its first U.S. Open in 34 years, which means many of the golfers will play on the course for the first time.

the game of golf began in seventh grade when his parents bought a house that happened to be across the street from a course.

"The third green was literally right across the street from my Continued on page 18



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Dave Johnson, director of grounds, says the health of the courses' fairways and rough have been an important part of The Country Club's restoration. Crews overseeded the rough and "treated it like shortgrass with aeration, verticutting and fertilizing," he says.



Continued from page 16

parents' house, so in the evenings and on rainy days, I was always over there playing golf and started to work there my junior year in high school," Johnson says.

With just four short years to get the bulk of the work done at TCC, Johnson says the team revamped nearly every aspect of the course: greens, bunkers, tees and roughs.

"We are focused on the greens being consistent, smooth and firm, but also a premium has been put on the condition and health of the fairways and rough," Johnson says. "We've been overseeding into the rough and treating it like shortgrass with aeration, verticutting and fertilizing. We had a practice run (last summer), and the saying was that 'the rough was real.' When this golf course has 3-inch, dense, thick rough ... It is a true championship golf course."

The Country Club worked with Gil Hanse, stripping the edges and expanding 17 of the Championship Course's 18 greens outward to improve surface drainage and create added hole locations. This process led to rebuilding or modifying all the bunkers that surround the greens. The team has also modified most tee boxes to improve surfaces and to add a bit more length, so the course will play around 7,263 yards.

"The green expansion was just phenomenal to have these additional areas," says Andrew Updegrove, former 2022 U.S. Open director of operations and projects, now golf course superintendent at Baker Hill GC in Newbury, N.H. "It doesn't look like anything was forced here. They truly fit in."



Alex Stuedemann Director of Golf Course Maintenance Operations TPC Deere Run

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Continued from page 18

The Bunkers were all updated or rebuilt with proper drainage and liners — the majority of them in-house under the leadership of Updegrove and Adam Bennett, superintendent.

"When we first started work on the bunkers, we worked closely with Gil and his team," Bennett says, adding that the team made use of a Kubota mini excavator and the Better Billy Bunker System. "We used historical photos, and Andrew spent a lot of time



HAVING A SOLID AND TRUSTWORTHY GROUP AROUND YOU HELPS ALLEVIATE A LOT OF THE STRESS THAT THIS CAREER CAN THROW AT YOU."

— ANTHONY HOWARD Superintendent, The Country Club

in the archive room digging up photos. I think most of them were from the 1930s. I remember being down on the 4th hole, and we started digging and found the old sand line of an abandoned bunker. We put that bunker back to the exact location using the historical photos and carefully excavated to the sand edge of the original bunker that had been filled in at some point in time."

Updegrove notes that much of the new construction occurred between 2019 and 2021 during the shoulder seasons, with priority set on keeping the golf course open to members outside of a brief period in 2020 due to COVID-19.

"We were trying to work on certain segments, manage the traffic and get creative coming up with alternate golf courses, picking 18 holes for members to play so we could get all this work done," Updegrove says. "When we stripped the sod from green No. 11 to do the expansion work, it was done in the middle of the night because Gil was coming in for only six hours, so we had to prepare, we had light towers and were ready for his arrival."

The course consists mostly of *Poa annua* greens, with *Poa* and bentgrass fairways.

Historically, the course has struggled with anthracnose, bacterial wilt and winter ice damage, so Johnson — who has been dubbed by his teammates as "The Sandman" due to his affinity for topdressing — says The Country Club employs a fairly aggressive cultural program to create a better growing environment and playing surface.

"It all started with testing the soils throughout the property and amending them to ensure the plants had the essential nutrients available to grow healthy," Johnson says. "Once we did that, the grass got stronger, tougher and healthier."

Johnson says he's often overwhelmed when he thinks about how many accomplishments the team has carried out in the four years since he came on board.

"It's not only about what we accomplished, but how much we accomplished in this small window of time," Johnson says. "There's an area I call 'The Pinnacle' at the eighth and 10th tee, where you can get a 360-degree view of six holes on the course. You can see a lot of the work we've accomplished from there. You *Continued on page 22*



A project that featured help from golf course architect Gil Hanse expanded 17 of the 18 greens at The Country Club. The project improved surface drainage and added hole locations. The surrounding bunkers also received modifications or rebuilds.

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Continued from page 20

can quickly forget about what you have done when you're moving through things at 100 miles an hour. We could not have carried out all of this work without great leadership, teamwork and buyin from the entire TCC staff."

Other preparation for the event has included meeting and speaking with past U.S. Open superintendents, such as Stephen Rabideau at Winged Foot GC, Jon Jennings at Shinnecock Hills Golf Club and Rich McIntosh at Torrey Pines and attending the recent U.S. Opens to observe and get a feel for how everything runs.

When the time for the event comes, Johnson, Updegrove, Bennet and Howard all say they will be sure to soak it all in.

"Even right now, I'm getting goosebumps thinking of seeing people on this property," Updegrove says, noting the USGA expects 175,000 people over the course of the week. "As a kid, I remember seeing The Country Club on TV, and I never thought I would end up here. It's pretty special."

Those who made it happen

When it comes to those who got it done — the crew — Superintendent Anthony Howard says everyone treats each other like family.

"We're always joking around having a good time, but we also all

The Volunteers

Of the 100 volunteers slated to ascend on The Country Club the week of the U.S. Open, about 50 of them will hail from the Northeast, according to Andrew Updegrove, former 2022 U.S. Open director of operations and projects, now golf course superintendent at Baker Hill GC in Newbury, N.H..

"It's an eight-day commitment, which is a lot of time, especially for superintendents in June," he says. "As far as the volunteers go and our staff goes, we want them to enjoy it. We want everyone to be smiling."

The Country Club and the USGA will cover the program's costs — with the assistance of partners Toro, BASF and Tom Irwin including travel expenses and accommodations — for all interns.

"One of our main goals is to create a top-notch program for volunteers where they can come and network and build relationships," he says. "We want to have them really take it all in."

Dave Johnson, director of grounds at The Country Club (TCC) agrees, saying "The volunteer staff is so vital to running a championship like this, as they're behind the scenes making sure everything is in ideal condition. It's also our goal to welcome these volunteers to TCC and provide them a valuable experience including educational and networking opportunities throughout the week."



know when it's go time," Howard says. "It's that family environment because, let's face it, we spend more time with each other, so having a solid and trustworthy group around you helps alleviate a lot of stress that this career can throw at you."

Howard notes that with so many seasoned crew members, he can rest easier knowing he won't have to check up on their every move.

"The crew we have here right now all know what is expected, and there's no sense of needing to baby sit one another," Howard says. "I also tell everyone, 'Be patient and remember that everyone does a little bit of everything. Accept your role, learn as much as you can and don't just blend into the weeds."

Updegrove, who after 14 years at the club moved on as head superintendent at Baker Hill Golf Club, agrees.

"When you pull into that parking lot at 5:15 in the morning, and most of the staff is already here with smiles on their face, it says a lot about the culture," Updegrove says. "Also, between myself, Anthony and Adam, we have more than 35 years of combined experience here, and it's because we love coming here. The senior leadership here creates a very special place to work at."

Johnson adds that one of the most rewarding parts of his tenure has been watching employees learn and grow.

"To watch these young men and women just thrive and take the ball and run is one of the most rewarding things," Johnson says. "This is what people are being trained to do — to be able to go out on their own to fly."**⊙** RESEARCH FOR REAL SUPERINTENDENTS

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// HAVE A PLAN

PESTICIDE REGULATIONS: PREPARE FOR THE WORST

By Steve Kammerer

orking in Europe for almost four years, I observed how strict some countries were with pesticide use regulations. To hope that similar restrictions and regulations will never impact the U.S. and our industry may be wishful thinking. There is legislation currently proposed to ban certain insecticides critical to maintaining golf course turf and proposed regulations that mirror the EU.

It is vital to support advocacy and educational efforts. Still, it may be worth making plans for worstcase scenarios. Does your program rely heavily on pesticides or one pesticide in particular? What would happen if the Environmental Protection Agency (EPA) pulls the registration or cuts the allowed rate or the number of applications?

Take stock of the pests that affect your course and the applications made to control them. Organizing these by chemical class, mode of activity and the number of applications can clarify whether you depend too much on one chemical or one class of chemistry. Different management approaches — whether chemical or cultural — can help reduce applications and perhaps prolong the left



Tracking, monitoring and sampling pest populations is more important to maximize control using the chemistries available, while minimizing the risk of another problematic pest.

help reduce applications and perhaps prolong the longevity of the available products.

Pesticides, today, are generally narrower in the spectrum, lower in rates and longer in residual. We also have fewer modes of activity to control pests. Companies introduce fewer new chemicals each year, leading to more reliance on what is available. As a result, monitoring, sampling and tracking pest populations is more important to maximize that control while minimizing the risk of another pest becoming problematic.

I once helped a golf course in an environmentally sensitive area put together a plan for each pest and preferred treatments based on thresholds, the optimum timing for applications and risks based on water solubilities, half-life and potential for binding to organic matter. The plan helped alleviate concerns from the public and governmental agencies and prioritize needed pesticide applications.

The best time to prepare for a crisis is before it hits. Having a plan and an alternative helps keep you ready for any future changes. **G**

Steve Kammerer, Ph.D., is a senior consulting agronomist for the USGA Green Section Southeast Region. You can reach Steve at skammerer@usga.org.

Reference

USGA

PHOTO BY:





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

NEWS UPDATES

SYNGENTA ENHANCES WEEVILTRAK WITH ASSURANCE PROGRAM

For the 2022 annual bluegrass weevil (ABW) season, Syngenta introduced a new method of control of ABW, all white grub species and turf caterpillars with its WeevilTrak ABW assurance program

The WeevilTrak ABW assurance program is guaranteed for superintendents following the company's Annual Bluegrass Weevil Optimum Control Strategy and WeevilTrak.

"Our research has shown that 94 percent of WeevilTrak subscribers value an assurance program for ABW, grubs and turf caterpillars, so we are excited to offer this guarantee to help superintendents feel confident about their control," said Stephanie Schwenke, market manager for turf with Syngenta.

To qualify for the assurance, superintendents must be registered WeevilTrak users, follow at least one course and make product applications at the rates stated in the Optimum Control Strategy.

If acceptable ABW control is not achieved or unexpected turf damage occurs, the user needs to contact their local Syngenta territory manager to review the performance of the Optimum Control Strategy, to confirm product recommendations and timing were followed, and that the resulting damage is due to ABW feeding.

INSECTICIDE RESISTANCE IS A RISING ISSUE AND A DRIVING FORCE IN THE RETHINKING OF ABW MANAGEMENT."

Ben McGraw, Ph.D., and Albrecht Koppenhöfer, Ph.D. (see story on page 24)

//TRENDSETTER

What are the trends with annual bluegrass weevil in eastern North America?

By Benjamin McGraw, Ph.D., and Albrecht Koppenhöfer, Ph.D.

The profitability of golf course operations can be significantly affected by various pests. In Eastern North America, one of the most threatening pests is the annual bluegrass weevil (ABW), *Listronotus maculicollis* (Kirby) (13). ABW is thought to be native to North America, where it is broadly distributed and collected from various wetland habitats such as marshes and lake margins (9).

Presently, chemical control is the only effective strategy for ABW management (14). Turfgrass managers often use broad-spectrum insecticides — primarily pyrethroids — to prevent adults from ovipositing. Not surprisingly, pyrethroid resistance has been reported (10) and seems to be on the rise. Most of the presently available insecticides seem to be less effective against resistant ABW populations (4).

Insecticide resistance is a rising issue and a driving force in the rethinking of ABW management. Efforts continue to develop more sustainable management practices and improve ABW monitoring (5,6). But with the continued high expectations on turf quality, synthetic insecticides will remain an essential part of ABW management. Careful measures are needed to prevent resistance development in new populations and new chemistries.

Our ultimate goal is to develop optimal management recommendations for the ABW population with different insecticide resistance levels. We are conducting laboratory and field studies to understand better the scope of resistance in ABW. It is also important to gather information from the



Distribution of the L. maculicollis Management Survey responses.

superintendents to better understand the geographic spread and severity of ABW and its resistance issues and the prevalence of currently used monitoring and management practices. To achieve the latter, we conducted a survey summarized below.

SURVEY METHODS

In fall 2014, we surveyed to capture regional trends in ABW management to understand the severity and extent of the damage throughout the area in which the pest currently is causing problems on golf courses. The survey aimed to capture responses from superintendents who manage ABW populations.

We sent a web link for the survey to golf course superintendents through various avenues. The survey was available from November 2014 to January 2015. Questions in the survey could be grouped into three general categories:

• Local and regional damage: Turfgrass areas damaged (e.g., greens, tees, fairways), number of damaged areas, seasonal occurrence of damage.

Anagement of ABW populations: Number of insecticide applications, total insecticide budget, pyrethroid use and suspected (or confirmed) development of insecticide-resistant populations.

S Integrated pest management practices: Scouting techniques, spot treatment frequency, acquiring information and monitoring activities.

We received most surveys from superintendents at 18-hole facilities (233 of the 293 responses = 79.5 percent). Therefore, budget values were transformed into 18-hole equivalents for several economic statistics. The proportion of insecticide expenditures within the annual maintenance budgets was calculated only for responses from the 18-hole golf courses. All survey responses were converted to 18-hole equivalents before analysis by nonparametric Rank Sum Tests (Statistix 9.0 software).

RESULTS AND DISCUSSION

In the two-month survey, we collected responses from 293 golf courses in 14 states and two Canadian provinces (Figure 1). The survey was completed by an estimated 5.6 percent of the 5,197 facilities in the surveyed area (2,3). There were eight different regions and four subregions (Table 1).

Local and regional ABW damage

Most respondents (90 percent) indicated ABW was present in damaging densities on their course. Twenty-nine respondents (10 percent) either stated they did not observe damage or failed to provide any answers to questions regarding areas damaged by ABW. These courses were located throughout the surveyed area.

Areas damaged

Only surveys that indicated ABW was a pest were used in reporting damage

TABLE 2

incidence to select turf areas. The average course experienced damage to 6.6 fairways, 5.7 tee boxes and 6.4 greens/ collars (Table 2). We estimated that on average, 10.8 acres of fairway, 0.95 acres of tees and 1.06 acres of greens/ collars, for a total of 12.8 acres, require protection on an 18-hole golf course.

Damage by Turf Area

ABW damage was most common on fairways and collars/aprons (Table 2). Only 10 percent of respondents reported damage to roughs. This data is not surprising, given the weevil's preference for annual bluegrass (*Poa annua*) and creeping bentgrass (*Agrostis stolonifera*) maintained under Continued on page 26

TABLE 1

Regions and subregions used for categorizing survey data for annual bluegrass weevil geographically, number of completed surveys by region, and total golf facilities in the region (percent surveyed).

Region	Subregion	Responses	Total facilities in the region
Northern Periphery ME, NH, VT, QUE, ONT)		13	1,506 (0.9%)
MA		33	370 (8.9%)
СТ		25	174 (14.4%)
NY		56	799 (7.0%)
	Long Island	20	
	Upstate NY	26	
NJ		32	285 (11.2%)
PA		74	661 (11.2%)
	Eastern PA	30	
	Western PA	38	
DE-MD-VA		42	541 (7.4%)
Western Periphery (OH, WV)		16	804 (2.0)%

ONT = Ontario; QUE = Quebec

Annual bluegrass weevil damage to turfgrass by location on the golf course and by season.

Distant.	Damage by season (%)			Location of damage ^b (%)				No. damaged ^e			WithoutDamage ^d	Height-of-cut ^e		
Region	Spring Summer		Fall	Al	G	T	C/A	FW	R	G/C	T	T FW	(%)	inches
All Regions	38	84	14	5	26	34	58	69	10	6.4	5.7	6.6	14	0.119
Northern Periphery	8	77	0	0	38	31	69	54	8	5.0	4.7	4.9	15	0.126
MA	21	82	12	0	20	30	57	57	3	6.6	5.0	6.0	9	0.119
CT	52	88	20	8	40	64	96	68	8	7.4	4.7	5.1	0	0.123
NY	43	88	9	2	16	38	54	70	9	5.9	6.4	7.7	11	0.118
Long Island	40	90	15	5	10	45	55	65	5	6.3	7.7	9.1	5	0.111
Upstate NY	46	85	0	0	19	23	58	69	12	4.9	6.6	6.3	19	0.123
NJ	47	75	31	22	31	22	63	66	3	7.4	5.0	6.7	6	0.120
PA	39	70	11	1	20	36	55	64	12	6.3	6.6	7.5	8	0.111
Eastern PA	50	66	11	3	21	37	55	47	5	6.6	6.2	7.4	8	0.118
Western PA	21	58	8	0	16	26	42	55	13	5.6	8.2	7.4	13	0.109
DE-MD-VA	14	52	14	0	20	17	23	31	9	6.8	4.0	4.4	48	0.124
VA	11	44	19	0	21	11	26	26	16	6.4	2.0	3.3	59	0.125
Western Periphery	5	11	0	0	5	4	9	4	1	3.1	1.3	1.7	19	0.121

* Abbreviations see Table 1.

^b G, Green; T,Tees; C/A, Collar/Approaches; FW, Fairway; R, Rough.

^c G/C, Greens/collars; T, Tee; FW, Fairway. Transformed to an 18-hole equivalent; no responses were removed from statistics

^d Proportion of respondents that did not report damage to any area.

* Average putting green height-of-cut in inches.

Continued from page 25

half-inch cutting heights (12,5) and the composition of turfgrasses likely to be found in rough (e.g., *Poa pratensis*, *Festuca* spp., *Lolium perenne*).

The incidence of damage to putting greens (26 percent) was unexpectedly high given the low mowing heights reported across the region and the traditionally high intensity of insecticide use



The percentage of surveyed golf courses was categorized by putting green mowing height (A) and those that experienced annual bluegrass weevil damage to putting surfaces (B) by mowing height.

FIGURE 3 Pyrethroids Adulticides Chlorpyrifos Carbaryl Anthranilic Diamides Indoxacarb Trichlorfon Larvicides Spinosad Neonicotinoids Combination products 20 80 40 60 100 Percentage of Responses

Chemical insecticides used in annual bluegrass weevil management. Combination products include insecticides with two active ingredients (e.g., bifenthrin and imidacloprid).

on greens. Two-thirds of the courses that reported ABW damage to greens had heights of cut (HOC) greater than the survey average, which was 0.119 inches across all survey responses (Figure 2).

Regions with the highest incidence of damage to putting greens included Connecticut, northern peripheral states/ provinces and New Jersey (Table 2). The average putting green HOC of 0.120 to 0.126 inches in these regions was greater than the survey average. The lowest incidence of ABW damage to greens was reported in Long Island, and western Pennsylvania and the two subregions with the lowest average green HOC of 0.110 and 0.109 inches, respectively.

TABLE 3

Distribution of annual maintenance budgets of surveyed golf facilities (9, 18, 27, and 36-hole courses)

Maintenance budget (\$)	No. of responses	%
\$1,500,001 - \$2,000,000	29	10
\$1,000,001 - \$1,500,000	64	22
\$750,001 - \$1,000,000	37	13
\$550,001 - \$750,000	41	14
\$350,001 - \$550,000	55	19
\$200,001 - \$350,000	42	14
<\$200,000	18	6

Seasonal damage

Most superintendents (84 percent) reported damage appearing in the summer, followed by 38 percent reporting springtime damage (Table 2). This result was surprising since larvae are more dense and aggregated in the first generation than in the following generations (13). Few reported fall damage (14 percent) or damage appearing during all three seasons (five percent).

New Jersey and eastern Pennsylvania had the highest spring damage (first generation larval). The regions further to the north, including Long Island, Connecticut, upstate New York and Massachusetts (90, 88, 85 and 82 percent, respectively), reported a very high incidence of summer damage.

New Jersey, Connecticut and Virginia reported the highest amounts of fall damage (31, 20 and 19 percent, respectively). The northern peripheral states/ provinces (Maine, New Hampshire, Vermont, Ontario, Quebec) reported the most damage in summer (77 percent), with no observations of damage occurring in all three seasons or solely in the fall.

POPULATION MANAGEMENT Budgets

The region's annual maintenance budgets for all surveyed golf courses demonstrated peaks between \$1.0 million and \$1.5 million and between \$350,000 and \$550,000 per year (Table 3). Annual insecticide budgets averaged \$9,270 and ranged between \$50,00 and \$75,000 per year. When adjusted for an 18-hole equivalent, the median insecticide budgets ranged between approximately \$4,000 to \$17,000, where there were enough responses to summarize (Table 4). We estimate that insecticides account for 1.23 percent of the total maintenance budget.

Chemical management

A significant portion of the survey's questions dealt with insecticides, a primary component of most ABW management programs (7). Each super-

//TRENDSETTER

Research Takeaways

- The annual bluegrass weevil (ABW), Listronotus maculicollis (Kirby), is the most difficult to control insect pest of shortmown golf course turf in the Northeastern U.S. and eastern Canada.
- We surveyed golf course superintendents throughout the ABW area of impact to better understand the severity of the damage, prevalence of insecticide resistance and trends in management practices.
- The average ABW population caused damage to 6.6 fairways, 5.7 tee boxes and 6.4 greens/collars, amounting to 13.8 acres.
- On average, courses made 3.9 insecticide applications per year and spent \$9,270 on ABW management.
- Twenty percent of the superintendents reported having a pyrethroidresistant ABW population, though reports of higher-than-average incidence came from areas with long histories of managing ABW.
- "Resistant" populations caused more damage than "susceptible" populations, reported higher average insecticide budgets and were more likely to make more than five insecticide applications per year than "susceptible" courses.
- Surveys indicated that 90 percent of turf managers used multiple monitoring tactics to better time and target controls despite the reliance on chemical controls.

intendent surveyed identified at least one product used to manage the ABW, even though 10 percent of responders reported no damage to any areas (Figure 3).

The pyrethroids and chlorpyrifos (Dursban), used by 79 percent and 65 percent of respondents, respectively, were the most popular means of controlling ABW adults, despite the development of pyrethroid resistance (10,11) and indications that chlorpyrifos efficacy may also be reduced (1).

The anthranilic diamide, chlorantraniliprole (Acelepryn), was the most widely used larvicide, which may, in part, be due to its broad spectrum of activity and role in preventive white grub management. Cyantraniliprole (Ference), another anthranilic diamide, was not yet registered for turfgrass at the time of our survey.

Courses made an average of 3.9 insecticide applications per year to manage ABW (Table 4). Courses in states/regions with above-average application frequency were located around the epicenter of ABW distribution (New Jersey, Massachusetts, Connecticut, Pennsylvania and New York).

Superintendents on Long Island, where the relatively longresidual anthranilic diamides are not registered, made the most applications to control ABW per year (5.5) and had the highest use of pyrethroids (85 percent). Thirty percent of superintendents in this area reported making six or more annual ABW insecticide applications (survey average = 18 percent), and 20 percent made ten or more applications (survey average = six percent).

Pyrethroid-resistant populations

On average, superintendents reported making 2.7 pyrethroid applications per year (Table 4). The regions with the highest pyrethroid applications included MA and the northern peripheral states/provinces.

One in five courses reported having a pyrethroid-resistant ABW Continued on page 28



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TABLE 4

Average insecticide budgets and trends in chemical management of annual bluegrass weevil.

Region	Median insecticide budget (\$) 9,270	ABW a	pplications/ye	ar	Pyrethroid applications/	Resistance	Noticed decrease	
		Average per year	>5 Apps (%)	>9 Apps (%)	year for all pests on golf course	suspected? (% Yes)	in effectiveness of treatments? (% Yes)	
All Regions		3.9	18	6	2.7	19	14	
Northern Periphery	4,781	2.2	0	0	3.6	0	0	
MA	10,843	4,4	13	10	3.9	0	7	
CT	14,627	4.2	20	12	1.7	48	24	
NY	10,112	4.1	18	14	3.3	29	29	
Long Island	17,047	5.5	30	20	2.9	55	35	
Upstate NY	4,072	2.3	0	0	2.7	8	8	
NJ	13,770	4,4	23	0	2.4	28	19	
PA	9,628	4.2	24	1	3.0 22		12	
Eastern PA	11,422	4,4	24	3	2.9	24	18	
Western PA	8,914	3.9	23	0	3.3 17		7	
DE-MD-VA	7,422	3.6	17	0	2.8	5	7	
Western Periphery	10,444	2.9	0	0	2.0	0	19	



Distribution of surveyed courses with suspected or confirmed pyrethroid-resistant annual bluegrass weevil populations.

Continued from page 27

population either suspected or confirmed by bioassay. "Resistant" populations were located everywhere, though higher than average incidence came from areas with long histories of managing ABW, including Long Island, Connecticut and New Jersey (Table 4 and Figure 4).

Overall, "resistant" ABW populations caused more damage than susceptible populations when grouped by seasonal damage incidence (93 percent vs. 74 percent of courses, respectively). Courses with "resistant" populations had a significantly greater number of turf areas damaged, including 84 percent and 85 percent of collars/approaches and fairways damaged, versus 48 percent and 52 percent for courses with susceptible populations.

Courses reporting resistance also had higher numbers of sites damaged (21.2 vs. 9.8 combined turf areas, respectively). Interestingly, a significantly higher percentage of "resistant" courses (36 percent) than susceptible courses (21 percent) reported damage to putting greens despite the "resistant" courses having a significantly lower average green HOC of 0.112 inches than the susceptible courses at 0.12 inches.

Chemical selection differed greatly between the two types of ABW populations (Figure 5). Larvicides, especially chlorantraniliprole, indoxacarb (Provaunt), spinosad (Conserve) and trichlorfon (Dylox), tended to be used more on courses with "resistant" than courses with susceptible populations.

Most (93 percent) superintendents of courses with "resistant" populations used chlorpyrifos in adult management. A relatively high percentage of respondents (64 percent) still used pyrethroids. Also, "resistant" courses were much more likely than susceptible courses to select older broad-spectrum insecticides like trichlorfon (67 percent vs. 34 percent for susceptible courses).

Integrated Pest Management

Superintendents emphasize preventative control of pest problems to maintain aesthetics, playability and damage avoidance. Nevertheless, they can incorporate many aspects of integrated pest management (IPM) into their management of ABW, including monitoring, reducing chemically treated areas, using relatively resistant turfgrasses and applying curative controls (e.g., larvicides) to at-risk areas on the course. Most (73 percent) responders indicated that they "always" or "sometimes" employ spot treating as a means of controlling ABW. Only 16 percent indicated that they never spot treat.

Monitoring Practices

Superintendents regularly employ scouting techniques to estimate ABW

// TRENDSETTER



Comparison of insecticide use by courses with pyrethroid-susceptible and "resistant" ABW populations.

population densities or determine their presence (Table 5). Most (90 percent) responders indicated they regularly use two or more monitoring techniques and 80 percent used three or more. Only 5.1 percent indicated that they do not regularly monitor.

CONCLUSIONS

This survey provides a broad framework

TABLE 5

Scouting methods employed by golf course superintendents in determining annual bluegrass weevil population development or density.

Scouting technique	No. of responses	%
Weevil Trak	200	72
Plant phenology	181	65
Check mower baskets	169	61
Soil coring	155	56
Growing DD	124	45
Soap flushes	111	40
Traps	79	28
Salt flushes	30	11
Vacuuming	17	6

for understanding the importance and spread of ABW as a golf course pest, the spread and severity of insecticide resistance and the need to communicate best **Continued on page 30**

PROVEN BY SCIENCE, APPROVED BY SUPERINTENDENTS GreenActivator[®] enhances root mass for greener, healthier, more resilient turf

All bent grass seeds started at the same time. Samples were pulled after 5 - twice monthly applications. Research from Iowa State University's Turf Grass Extension program shows the amazing above and below ground bio-mass increase with GreenActivator.



Continued from page 29

management practices for the pest. ABW clearly is a tremendous problem in the region, with 90 percent of respondents indicating damaging densities on their courses and about one-third of fairways, tees and greens/collars affected.

Resistance is already widespread, with 20 percent of responders (in some regions up to 55 percent) suspecting or having confirmed resistance. Since resistance may not be recognized until resistance ratios reach or pass about 30, many more courses will likely develop insecticide-resistant populations soon.

Despite reports of pyrethroid resistance, pyrethroids are still the most widely used insecticide class for ABW management, followed by another adulticide, chlorpyrifos. While "resistant" courses have made significant changes in insecticide use, notably greater adoption of larvicides and switching to chlorpyrifos as the primary adulticide, 64 percent of those courses still used pyrethroids.

Greater changes in types of insecticides used are likely being held back by a combination of risk-averseness, dominance of preventive approaches by superintendents and the much lower cost of adulticides compared to the more effective larvicides. However, few classes of insecticides are effective in controlling adult weevils, and the ability of those classes to control pyrethroid-resistant ABW populations is questionable, as highly pyrethroid-resistant populations already show increased tolerance if not resistance to all of them (4).

Our findings highlight the need for novel approaches to control adults. Registration of a new highly effective larvicide (cyantraniliprole, Ference) in 2015 (after this survey was conducted) is likely to increase larvicide use, at least against "resistant" populations.

Nearly all superintendents who deal with ABW monitor weevil populations, but the most widely used methods only help with the insecticide application timing instead of estimating population densities. However, 56 percent of respondents used soil cores to scout for larval stages, which is the most direct and likely most precise method to assess the need for treatments. Larvae monitoring will become critical if more courses move away from primary reliance on adulticides.

Because highly resistant ABW populations are also more tolerant if not resistant to most of the currently available larvicides (4), superintendents will also have to start relying more on biorational insecticides and cultural means to manage weevil populations. We are evaluating alternatives based on azadirachtin, Bacillus thuringiensis and entomopathogenic nematodes and some of them may offer viable options. Such options may become increasingly used, at least on courses with resistant ABW populations or ones in localities (e.g., Long Island, N.Y.) with special insecticide use restrictions. G

Benjamin A. McGraw, Ph.D., Pennsylvania State University and Albrecht M. Koppenhöfer, Ph.D., Rutgers University. For more information, please contact McGraw (bam53@psu.edu) or Koppenhöfer (koppenhofer@aesop.rutgers.edu).

Article adapted from: Benjamin A. McGraw and Albrecht M. Koppenhöfer. 2017. A Survey of Regional Trends in Annual Bluegrass Weevil (Coleoptera: Curculionidae) Management on Golf Courses in Eastern North America. *Journal* of Integrated Pest Management (2017) 8(1): 2; 1–11. doi: 10.1093/jipm/pmw014

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Super Science // EXPERTS' INSIGHTS



Stay ahead Monitoring irrigation system issues is key to ensure the system runs smoothly, especially during the busy season.

How to keep irrigation systems running all season long

Brad Jakubowski, irrigation technician and instructor at Penn State University, shares tips to keep irrigation systems running smoothly and effectively during peak times.

By Chris Lewis

To ensure their irrigation systems continue to operate throughout the busy time(s) of the year, Brad Jakubowski, irrigation technician and instructor at Penn State University, advises superintendents to be proactive.

For example, superintendents can prevent many potential issues through scheduled maintenance and monitoring, whether it's occurring daily, monthly or semi-annually. Jakubowski says superintendents should encourage staff members from mowers to those overseeing course setup — to take note of specific issues (preferably every day, but



Brad Jakubowski

especially on Fridays), including dry and wet spots.

Employees should take cell phone photos of the exact problems they encounter on the course to create a database featuring items to track, monitor, prioritize and fix. And, of equal importance, take advantage of the latest drone technology to note exact issues from above their course.

"Just as the captain of a ship should know every bolt and

weld of their vessel, the person in charge of irrigation (and/ or the superintendent) should also know the lifeblood of their irrigation system," Jakubowski says. "Know which heads and brands you have, along with their delivery characteristics, the types of pipes they have and the ages of their parts."

Additionally, superintendents must have up-to-date as-built diagrams of their irrigation systems. Since many courses use two-wire systems, these as-builts should also include detailed wiring diagrams within the diagrams and information about where every wire splice is.

Superintendents can also minimize system downtime by anticipating potential problems and having access to knowledge of as many parts and materials as possible.

"Make sure everyone is speaking the same language when it comes to ordering parts for stocking purposes, as well as immediate repairs," he says. "As an example of the significance of preparing for issues ahead of time, a single missing reducer bushing could hold up a repair for days or longer, versus having it accomplished immediately."

Hunter Industries

CARL EBERTS Category manager, golf



Superintendents should evaluate how much time they're

spending on irrigation management. To better manage the complexities of flow balancing and scheduling, among all their other responsibilities, they should develop a proposal to adopt a central control platform that allows them to make reliable, automatic runtime adjustments with a few clicks. If they are not equipped with the futureready tools they need to keep irrigation running smoothly in the background where it belongs, it's time to consider upgrading. They should also track how much they're spending on labor to make irrigation repairs and monitor the resources their irrigation system is consuming. By weighing the labor spent on repairing legacy systems against the potential water and electricity savings from improved distribution uniformity with a new system, they can determine a clear return on investment for upgrading to the latest golf rotor and control system technology.

Toro

JASON HABECK, CGCS Technical sales manager



Always be proactive, not reactive, when it comes to your irrigation

system. Keep these tips in mind to ensure the most expensive piece of equipment at your facility receives proper attention. Monitor it: Perform audits and test the system; watch it run at night under real-life conditions. Update central control: When you physically change nozzles, arcs or entire sprinklers, update the central control computer. Fine-tune it: Monitor moisture levels, adjust the entire system and fine-tune individual stations daily, based on moisture requirements. Routine maintenance: Don't wait for the system or turf to tell you there's a problem. Schedule regular maintenance checks and audits. Identify sprinklers that aren't properly adjusted, not rotating, have debris in the nozzles, have poor pressure, are not level or are not functioning before they become a problem. Inspect inventory: Check your parts inventory monthly and ensure common items are on hand. This is especially important as supply chain issues continue to impact most markets. Start early: If weather allows, start your system early and pressurize the system slowly so it's ready.

Ecologel Solutions

JIM SPINDLER, CPAG, CCA CSS Director of agronomy

Irrigation is critical to golf course maintenance, but, unfortunately,



sometimes even the most well-maintained systems fail. Having a plan and the right products to protect the turf during failures will reduce stress for both you and the turf. Hygroscopic humectant products, such as Hydretain or LESCO Moisture Manager, protect turf from drought stress during extended power outages or equipment breakdowns. Hygroscopic humectants condense the water vapor in the soil back into water droplets, making it available to plant roots. This process provides roots with moisture after the soil has begun to dry. Not only do hygroscopic humectants protect turf during emergencies, but they can also be part of a regular maintenance program to decrease the watering frequency, thus reducing irrigation system component wear and energy use. Furthermore, recent research shows that hygroscopic humectants increase nutrient uptake, helping to reduce fertigation requirements.

Rain Bird Golf

TONY WHELAN National sales manager

Superintendents can ensure that their irrigation system



themselves up for success during the off-season. Conduct irrigation audits and nozzle exchanges and repairs ahead of busy times - while also properly documenting any updates in their computer central control database - makes all the difference. Skipping the step of updating their records can negatively impact the system's efficiency very quickly. It's also hugely helpful to leverage soil and environmental data when optimizing an irrigation system. These data points often hold clues to effective water penetration and seasonal and regional conditions that impact irrigation needs. Finally, innovations in mobile-first irrigation management are bringing superintendents out of the back office and onto the course. The upcoming CirrusPRO irrigation system from Rain Bird allows them to make real-time adjustments and troubleshoot issues and water more efficiently right from the field, using their mobile devices.



"Trinexapac-ethyl's release changed how PGRs were used. We went from general products of one or two applications with a niche-type target to frequent, lower-rate applications with a broad range of plant health impacts beyond growth suppression."

KARL DANNEBERGER, PH.D., Science Editor

Why we need to remember the benefits of PGRs

hirty years ago, a new turf product was expected to have a significant impact on how we managed turfgrasses. I remember thinking, during the product's pre-release stage, that it would most likely have a minor impact. Time proved me wrong.

Ironically, I recently saw some of myself in a cryptocurrency advertisement, where comedian Larry David misses out on major innovations throughout history, including — as the ad would have you believe — cryptocurrency.

That new turf product released in the early 1990s was Syngenta's Primo (trinexapac-ethyl), a plant growth regulator (PGR). Prior to its release, we had several PGRs that were basically niche products. The PGRs available were:

• Mefluidide (Embark). Used for *Poa annua* seedhead suppression.

Amidochlor (Limit). Targeted more for lawn turf suppression.

③ Paclobutrazol (Scotts TGR). Marketed as a Poa annua suppressor in creeping bentgrass fairways.

These compounds were often applied once or twice a year and had a specific purpose.

BROAD APPLICATIONS

Trinexapac-ethyl's release changed how PGRs were used. We went from general products of one or two applications with a niche-type target to frequent, lower-rate applications with a broad range of plant health impacts beyond growth suppression.

Currently, trinexapac-ethyl is the active ingredient in several generic products. The formulations, including Primo MAXX, have evolved considerably since the original formulations. Originally, trinexapac-ethyl was an emulsifiable concentrate (EC) or watersoluble bag (WSB) formulation. Current formulations, like Primo MAXX, have enhanced trinexapac-ethyl for ease of handling and safety.

ABSORPTION CHARACTERISTIC

Given that few turf products have been as researched as trinexapacethyl, I thought I would focus on just one trinexapac-ethyl characteristic. Trinexapac-ethyl is foliar absorbed. This absorption characteristic is important when compared to gibberellic acid inhibiting PGRs like paclobutrazol and flurprimidol. From published research, we know that the absorption into the leaf occurs around one hour after application.

Absorption time has practical importance because a significant rain event immediately after application would most likely result in a loss of product effectiveness. However, if that same rain event occurred 1 or 2 hours after application, little effect would occur. Paclobutrazol and flurprimidol are root-absorbed. Anuew (prohexadione-Ca) is foliar absorbed.

The absorption characteristic of the PGR may impact seed germination and establishment. Trinexapac-ethyl being foliar absorbed does not impact seed germination or seedling growth. The practical importance is with the winter overseeding of bermudagrass. A common practice in winter overseeding is to apply trinexapac-ethyl to bermudagrass one to two days or so prior to seeding. Trinexapac-ethyl slows bermudagrass growth but does not inhibit the cool-season turfgrass seed germination or growth at overseeding. Root-absorbed PGRs can reduce seed germination and suppress growth.

As a precaution, know the absorption characteristics when using a combination PGR product with gibberellic acid inhibitors.

As summertime temperatures rise, the length of growth suppression from trinexapac-ethyl decreases. One factor reported is the half-life of trinexapac-ethyl reduces as temperatures increase. From a management perspective, increasing the rate is less effective than reducing the application interval. First, retain the rate but shorten the interval to regain the expected growth suppression.

Above, I have mentioned a few of the characteristics of trinexapac-ethyl and, to a lesser extent, other gibberellic acid inhibitors. As an integral part of golf course management practices for such a long time, some benefits and uses are taken for granted or forgotten.

Fortunately, a comprehensive library of research exists on the benefits and characteristics of trinexapac-ethyl, all you have to do is search for it. **③**

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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Mar W



"As a kid working on a golf course in El Cajon, Calif., I remember how it was a constant battle to keep *Poa annua* out of bentgrass greens. Yet, there were courses with greater than 90 percent *Poa annua* putting greens along the California coast."

MIKE KENNA, PH.D., Research Editor

Is *Poa annua* a friend or foe?

few weeks ago, the 'Idea of the Day' on LinkedIn was titled: *Rethinking weeds*. The quote with a close-up picture of a dandelion said, "We need weeds. They help to keep part of our spirit wild. And when we look upon them in a new light — they can be quite beautiful."

I thought about my perceptions of annual bluegrass or *Poa annua* — particularly the love-hate relationship with this grass. As a kid working on a golf course in El Cajon, Calif., I remember how it was a constant battle to keep *Poa annua* out of bentgrass greens. Yet, there were courses with greater than 90 percent *Poa annua* putting greens along the California coast.

NOT WITHOUT MERIT

Charles Piper, Ph.D., and Russell Oakley, Ph.D., penned an article in the March 1921 United States Golf Association Bulletin of the Green Section. The following is an excerpt from the article.

"As a putting grass, *Poa annua* is not without merit, at least in some latitudes. When abundant enough to make a solid turf, its putting quality is most excellent but a little slow. If only scattered plants occur in the turf, it is sometimes objectionable, as it may make the putting surface uneven. No matter how closely the grass is cut, it will still blossom and make seeds at the very surface of the ground. As the grass nears maturity, it gradually becomes paler, partly due to the abundant flowers, and is then not so attractive." As the Oklahoma turfgrass extension specialist in the mid-1980s, I only considered *Poa annua* as a weed to eradicate from the golf course. In the summer of 1987, I presented a progress report on the Oklahoma State University bermudagrass breeding program to the USGA Turfgrass Research Committee meeting in Salt Lake City, Utah. Donald White, Ph.D., also attended and talked about his annual bluegrass breeding program at the University of Minnesota. I was stunned that the USGA was supporting the development of *Poa annua* for putting greens.

CHANGE OF MIND

Fast forward to 1990, and now I am working as the research director for the USGA Green Section. Three years after 1987, I had mellowed on the idea of annual bluegrass breeding and the release of a variety. After traveling extensively to the Northeast and Pacific Northwest, I saw perennial biotypes of annual bluegrass that provided excellent putting surfaces.

White released 'DW-184' or 'True Putt' creeping bluegrass to Peterson Seed in 1997. Genetic classification suggested the more perennial types of annual bluegrass were *Poa annua* var. *reptans*. He renamed it creeping bluegrass to remove the stigmas of planting your greens with a grassy weed.

One of the early problems with 'DW-184' is infestation with larger, unwanted *Poa annua* in newly established putting greens. White thought this contamination was a production problem keeping unwanted wild-type annual bluegrass out of the seed production fields. New greens seeded with 'DW-184' were very rough-looking, but lower cutting heights slowly eliminated the coarser, less attractive plants.

BREEDING FOR THE FUTURE

In 1998, David Huff, Ph.D., started a breeding program at Pennsylvania State University to develop greens-type *Poa annua* with better temperature and disease tolerance. He collected more than 2,500 samples of greens-type *Poa annua* from the Northeast, Mid-Atlantic and Northwest U.S. Huff narrowed the vast collection to a few promising parents for a seed-propagated variety.

Unfortunately, the story ends here for now because Huff found that many greens-type *Poa annua* revert to ugly ducklings when put into seed production fields. It was not weed contamination but a genetic switch that caused taller, wider leafed, weedy plants that were undesirable for a putting green. Low mowing can cause plants to become smaller and denser, but they never return to the quality of their parents.

Don White passed away in December 2016 at the age of 86. His and Dave Huff's goal to provide improved annual bluegrasses for golf is on hold. Yet, the USGA at least supports extensive research on managing naturally occurring *Poa annua* disease and insect problems. Whether you think it is a weed or not, *Poa annua* is here to stay for some time into the future. **G**

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



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introduced its new LESCO S1 Creeping Bentgrass. Available exclusively at SiteOne, S1 is an improved creeping grass cultivator that suppresses *Poa annua*. Iowa State University, Rutgers University and National Turfgrass Evaluation (NTEP) tested S1 under the experimental designation of DLFPS-AP/3058 and AP2.

SiteOne.com

2 Excalibur

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3 Infinite

Infinite, from TARGET SPECIALTY

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Target-Specialty.com





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4 Dr. Motion Compression Socks

DR. MOTION invites superintendents to step into health every day with style. The company's compression socks offer an everyday wellness collection that keeps wearers on-trend for all seasons. The medical benefits are a part of each pair as well, with compression levels ranging from mild to graduated for women and men, providing comfort for all wearers. *DrMotionSocks.com*

5 | 180 E-Cut Hybrid Walk Greens Mower

The JOHN DEERE 180 E-Cut Hybrid Walk Greens Mower meets a superintendent's demands for a walking mower that offers a precise, clean cut with a tight, 18-inch cutting swath. The Quick-Adjust five cutting units and adjustable clip frequency make meeting differing turf conditions easy. The dual traction rolls provide straight tracking and require minimal turning effort. Additional features include a grass-catcher system, standard diagnostic light and onboard backlapping for easy reel maintenance. Deere.com

6 Flex Deck Mower Attachment

The **STEINER** Flex Deck attachment delivers a professional, finished cut, even on steep slopes and undulating terrain, including around bunkers and push-up greens. With clean directional side discharge, four independent 21inch decks and variable blade speeds, the Flex Deck follows any slope or contour without scalping. Attached to the Steiner 450 tractor with more than a dozen available attachments, it can be a part of a year-round maintenance program as one versatile machine. **SteinerTurf.com**

The 19th Loce

Steve Shand

SUPERINTENDENT // The Cliffs at Walnut Cove, Asheville, N.C.

What are you having? A cold IPA, the hoppier, the better. We've got a new brewery in town, New Origin. They've got some great ones.

How did you and Trish meet? We met in 2001 in Hawaii while in school. We went to Elon College, now University. They do a 4/1/4 (month) schedule and in January, they do a one-month concentrated class that we were both in. My sophomore year, I could either do ac-

counting in Burlington, N.C. or spend a month in Hawaii. So, I went to Hawaii and studied the culture and history.



Tell me about your golf course. It's a Nicklaus Signature design; 18 holes, built in '04-'05. All cool-season grass. We're centered right below the Blue Ridge Parkway. The course sits in a valley, and we have a horseshoe of mountains around the property. We're one of seven courses in the Cliffs family and the only one in North Carolina.

How do you like living in Asheville?

We're spoiled to live here. We've lived here now almost 10 years. The hiking, the



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//BEST ADVICE

breweries, the food. Right out of our backyard, we tie into miles of trail systems.

What was the highlight of your 2022 Masters experience? It's al-

ways great to get back. I was fortunate to intern there in 2004. It's great to go back and see all the familiar faces. It's crazy how many folks from back then still work there.

How did you get into the

business? I grew up in Maine, on a small island off the coast. My father was the GM of the club on the island, The Tarratine Club of Dark Harbor. At the age of 10, I was cleaning clubs and picking the range. When I was 13, I started working on the grounds crew. I didn't know if I wanted to go the superintendent route or the club pro route. In the morning, I would mow greens and do course set-up, then I'd change and teach junior clinics. I've been doing it forever. When I got to Elon, I told myself I was going to get out of the business. That lasted about a week.

Who is your golf course best friend, and what is your enemy? Wailua,

my yellow lab, is my best friend. Annual bluegrass weevil is my enemy. They keep swinging; they're out in droves right now. In Western North Carolina, this pest reacts differently. I emailed Ben (McGraw, Ph.D.) about it yesterday. I'm fortunate to get to stay in touch with him and let him know what we are seeing down here, and pick his brain. The students love our property. N.C. State was here, and one student said he loved coming here because he could get

his counts real quick. I told him, 'I'm so happy for you.'

As interviewed by Seth Jones, April 14, 2022.



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