INSIDE: Minimizing grubs / 32 | Miller: What makes a great superintendent? / 44

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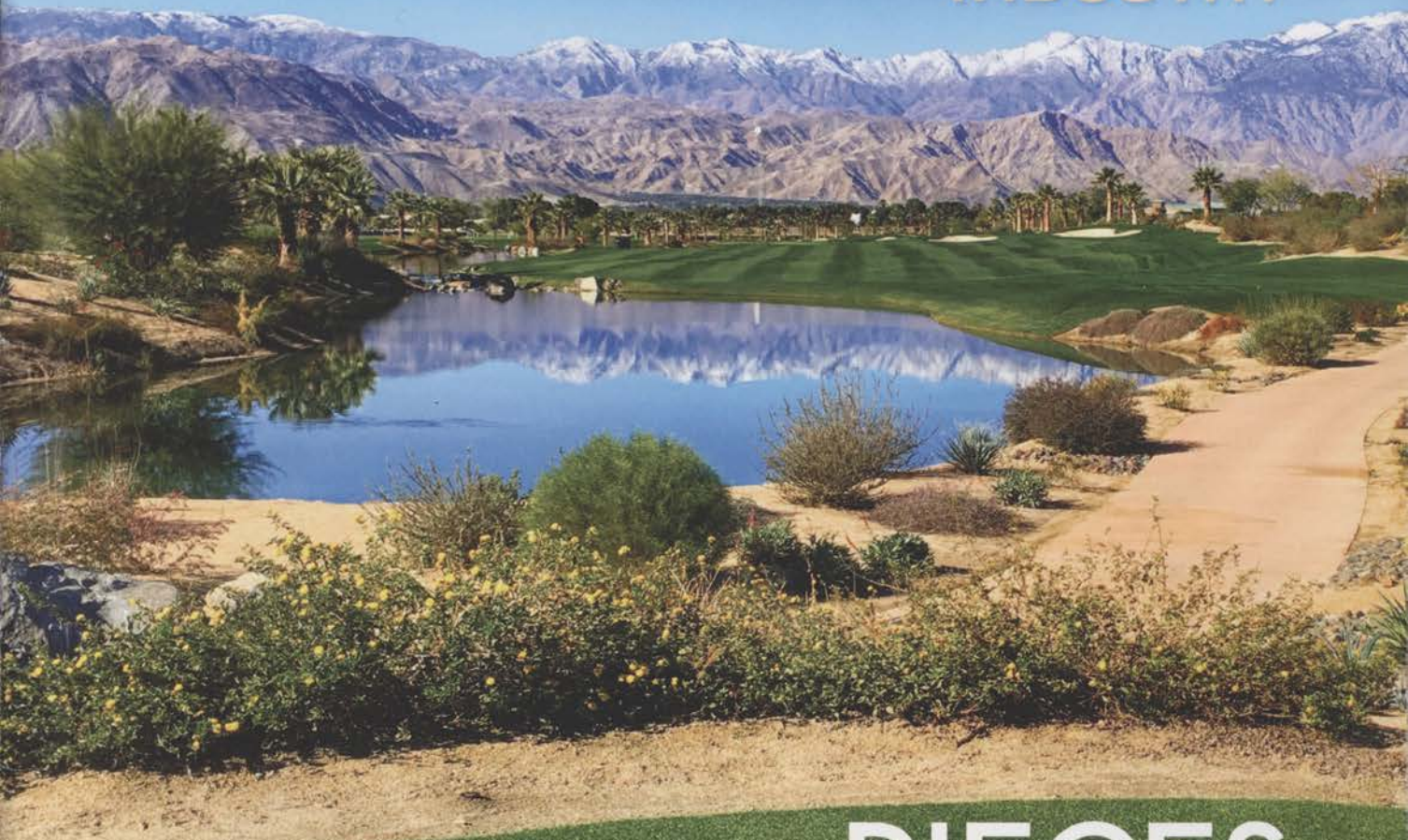

PIECES OF THE SAME PUZZLE

Superintendents are finding innovative ways to lead water-saving efforts in the demanding California desert. Their stories could help the next region facing a resource crunch.

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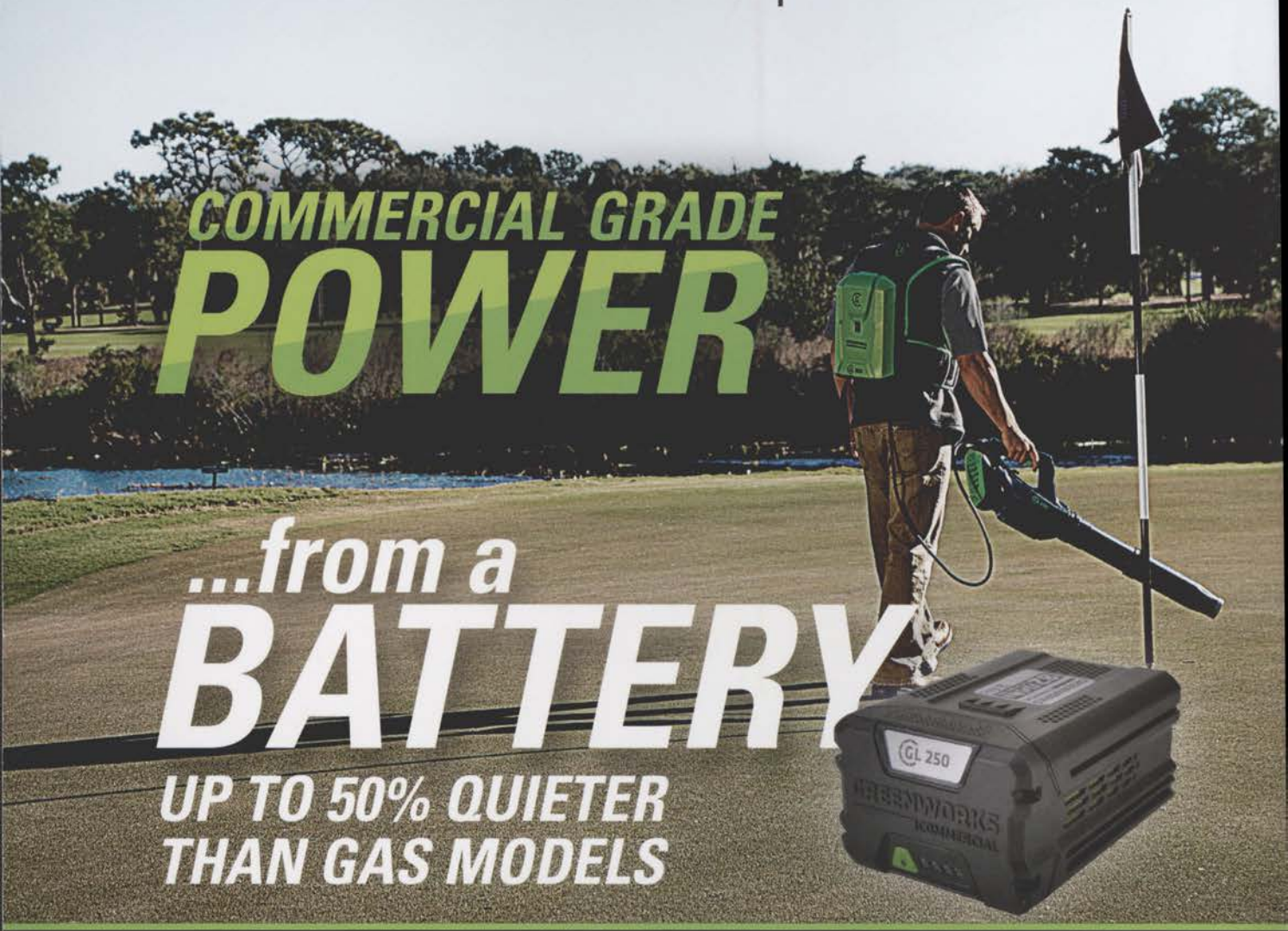

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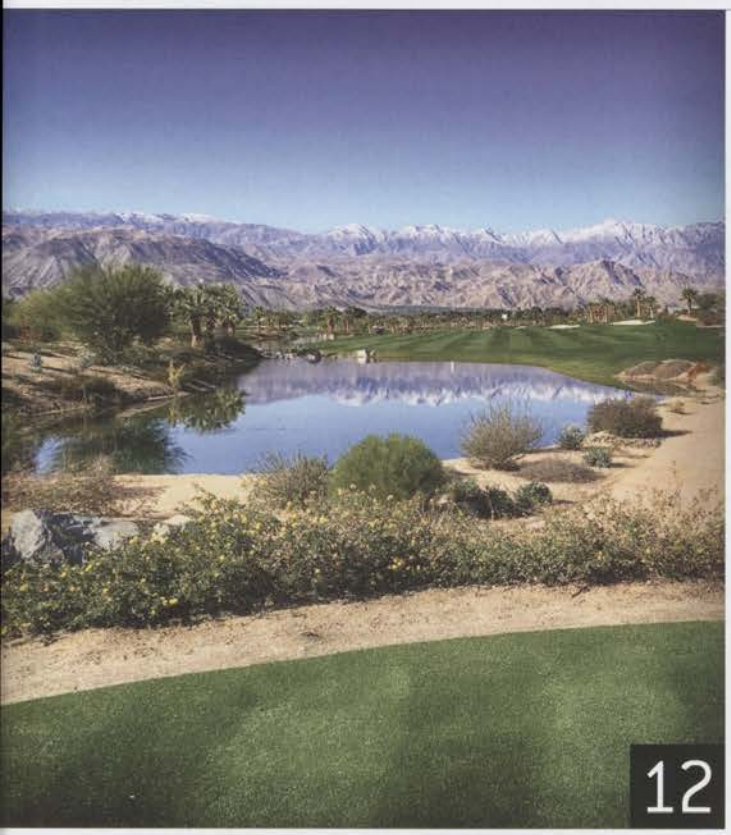
ON THE COVER
Associate editor Guy Cipriano shot this picture of the 12th hole at the Toscana Country Club North Course on his iPhone.

VOL. 29 NO. 3

IN THIS ISSUE



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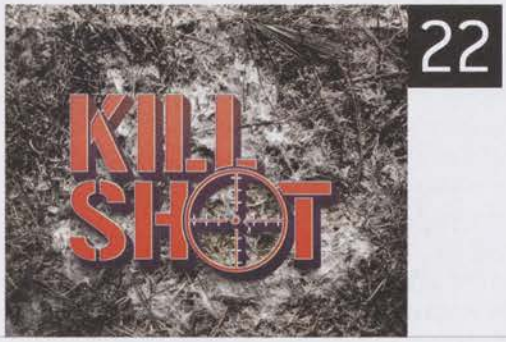
DEPARTMENTS

FEATURES



IT'S RAINING. NOW WHAT?

I'm a pseudo snowbird. When January arrives, I concoct ways to flee Northeast Ohio. Two of this winter's trips involved sojourns to Southern California, where I crashed on futons, couches and hotel beds. I visited family and friends, hiked a bunch, ate too much Mexican food, and obtained thousands of frequent-flier miles, rental car bonuses and hotel points. On the first trip, I toured the equivalent of nine 18-hole golf courses in two days.

I also saw rain. It not only rained on the coast. It rained in the desert, creating blooms in scraggly spots. The precipitation altered the PGA Tour's charge through Southern California, forcing agronomic teams and volunteers to spend more hours pushing water than mowing. Hundreds of crews could relate to what the teams at PGA West, Torrey Pines and Riviera Country Club experienced earlier this year.

Experts are declaring the five-year California drought over. Instead of rejoicing the replenished water tables, lakes and ponds, the golf industry should reflect and prepare to expand its leaner ways.

Guy Cipriano
Associate Editor

Our cover story, "Pieces of the same puzzle," explores how proactive superintendents in the golf-rich Coachella Valley are making gradual changes to save water. From a golf standpoint, the changes are overdue. Courses in competing arid markets such as Las Vegas, Phoenix and Tucson operate on less than 100 irrigated acres. Facilities that overseed 130 or more acres are common in the Coachella Valley. That two irrigated acres adjacent to the 13th tee box might be a duffer's paradise. But they serve no strategic purposes.

Abundant green sells homes – or at least it did during the 1980s and '90s. Developers used golf course aesthetics as bait, marketing acres of plush ryegrass to northerners looking for soothing winter escapes. Yesterday's promises place today's superintendents in tenuous spots. Why take the political risk of altering a property when a few clicks on the irrigation software can provide job security? The absence of enforceable measures and low water costs compared to other parts of California make duplicating '80s or '90s aesthetics a safe decision even during a drought.

Precipitation adds a layer of safety. State politicians look outside their Sacramento offices and see rain. The tops of mountains are covered with snow. Media outlets are reporting on floods instead of celebrity drought shamers and "water-guzzling golf courses." A wet winter has freed the industry from external scrutiny – for now.

"We know there's a cycle," says Stu Rowland, the director of golf course operations at Rancho La Quinta Country Club "We know because of our coastal prominence we are going to have significant wet years, but we are also going to have significant dry years. I think the new normal for us is figuring out a way to operate under a model that is sustaining through those anomalous years, whether it's wetter than normal or whether it's drier than normal. How can we do this more efficiently without getting into the 'crisis' that we were in?"

Shifting landscapes from overhead to drip irrigation, replacing turf in low-play spots, fitting plants to the landscape, extending the gap between irrigation cycles following rain and helping Rancho La Quinta decrease its reliance on groundwater are among the conservation tactics Rowland and his team are pursuing. Ranch La Quinta saved 200 acre-feet of water in 2016, Rowland says, and playing areas are still covered with splendid turf.

The superintendents profiled in our cover story offer a responsible guide on how to prepare for the political effects of a drought while appeasing snowbirds. And don't think rain will stop snowbirds from visiting Southern California. Have you experienced a Midwest winter? **GCI**

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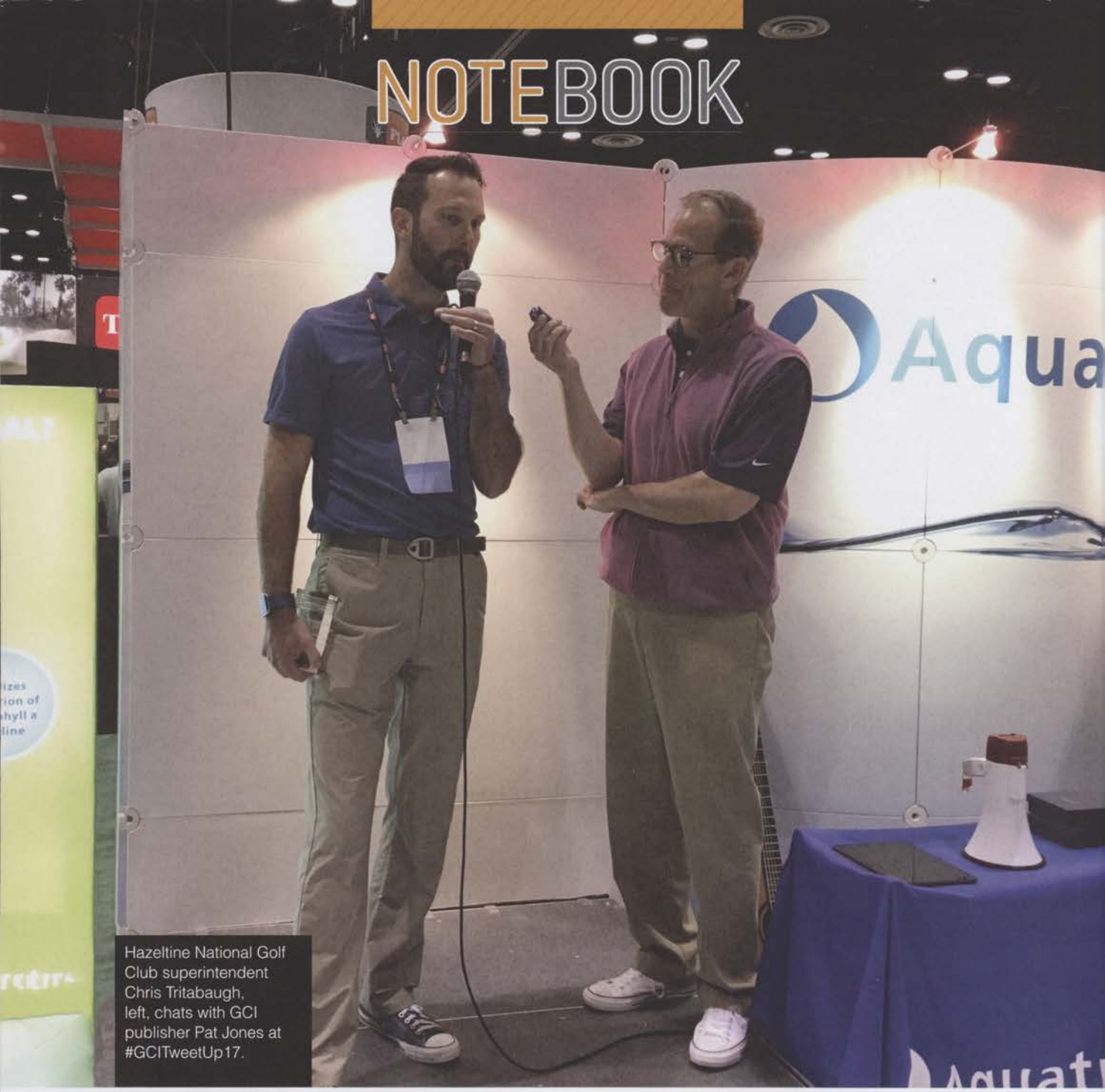

Hazeltine National Golf Club superintendent Chris Tritabaugh, left, chats with GCI publisher Pat Jones at #GCITweetUp17.

Tips from TRITABAUGH

Hazeltine National Golf Club's relaxed superintendent offers social media advice after receiving the John Kaminski Leadership Award.

By Guy Cipriano

CHRIS TRITABAUGH'S DEMEANOR and appearance suggest he's ready to lead a Silicon Valley company.

The industry's social media wunderkind – his 8,200 Twitter followers are more than numerous PGA Tour winners – wore golf shirts, jeans and Chuck Taylors as he strolled the Orange County Convention Center during the Golf Industry Show. He even warned followers of his intent to make GIS

a laidback affair. In a series of tweet before arriving in Orlando, Tritabaugh questioned the industry practice of wearing blazers, buttoned-down shirts and polished shoes to trade shows and conferences.

I'd wager we are one of the few industries left that dress up for their conference. Wear something comfortable, look professional, job done.

Oh and BTW, jeans can look professional. #justsayin

Tritabaugh expects and welcomes the engagement following tweets. The calm he displays when driving turf-centric Twitter conversations is one of numerous reasons he received the John Kaminski Leadership Award at #GCITweetUp17.

"I don't mind putting something out that's maybe sort of profound or maybe sort of a little provocative and getting a discussion going about it," says Tritabaugh, the superintendent at Hazeltine National Golf Club in Chaska, Minn. "That has never really bothered me and it still doesn't bother me. If it's smart and good discussion for our industry, then fire away."

GCI fired away at Tritabaugh after he accepted the Kaminski Award. Duplicating his social media feats, especially the show-all flurry of activity when Hazeltine hosted the 2016 Ryder Cup, is a giant challenge. But he's filled with ideas for superintendents looking to raise their Twitter games.

GCI: WHAT WOULD YOU TELL A SUPERINTENDENT WHO'S UNEASY ABOUT USING TWITTER?

CT: I think you have to be considerate of your employer. Think about what your employer wants. What kind of information do they want out? When you get into it, you have to be thoughtful of that and you have to be thoughtful of yourself. You don't want to have information out there that makes you look bad. You have to be considerate, but then have fun. Enjoy it. It can be such a benefit if you do it the right way."

GCI: HOW HAS YOUR USE OF TWITTER EVOLVED?

CT: I think I have just gotten smarter on how I use it. In some ways, I pay less attention to what other people are saying and focus more on my own thing. That's not a selfish thing. It's more of a time management type of thing. I use to be a little argumentative if I saw something I didn't agree with. I might have gotten into a conversation about it, which in hindsight wasn't really necessary.

GCI: WHAT'S BEEN THE MOST FULFILLING THING ABOUT USING SOCIAL MEDIA FOR WORK PURPOSES?

CT: The Ryder Cup was great and I love that I have gotten to do that in my career. But I also wanted to make an impact in the industry and maybe change some things in the industry that I don't think are particularly good. Because of the Ryder Cup and use of social media, that platform has taken place.

GCI: WHAT DO YOU WANT TO ACCOMPLISH ON SOCIAL MEDIA IN 2017?

CT: I want to help the industry through some of the things maybe there's a struggle with. I think we can be better leaders toward our people that work for us. I think we can be stronger communicators toward what we do and the good that we do. I want to work with that stuff.

GCI: WHO DO YOU ENJOY FOLLOWING ON TWITTER?

CT: I haven't solved all the agronomic problems that I want to solve, but I have really gotten into looking at leadership stuff. Anybody who's a good leader and has a good leadership style is somebody I'm happy to follow.

Enter bit.ly/2lEO2vz into your web browser to see #GCITweetUp17 video.

Tartan Talks No. 8

Seven tees on one hole? For one North Carolina course, it makes perfect sense and key participants in the project are hoping it spurs a larger movement.

Bill Bergin joined us for a "Tartan Talks" podcast to discuss the Longleaf Tee Initiative, a partnership involving the American Society of Golf Course Architects Foundation and U.S. Kids Golf Foundation launched at GIS. The initiative's goal is to use a variety of strategically placed tee options to increase playability and golfer enjoyment.


Bergin

With guidance from Bergin, Longleaf Golf & Family Club, a Pinehurst-area facility owned by U.S. Kids Golf President Dan Van Horn, recently implemented the program. Course yardages at Longleaf range from 3,241 to 6,602 yards and numbered poles beginning with 100 yards on the practice range help golfers determine appropriate tees. "It's a living laboratory," Bergin says.

Enter bit.ly/2l8Gqow into your web browser to learn more about the Longleaf system and Bergin's career.

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Tim Moraghan, principal, ASPIRE Golf (tmoraghan@aspire-golf.com). Follow Tim's blog, Golf Course Confidential at www.aspire-golf.com/buzz.html or on Twitter @TimMoraghan

Sometimes, you may feel like you are all alone out there, dealing with your own set of problems, challenges, stresses and woes. But, talk to your fellow superintendents and those issues dissipate and resolutions seem clearer.

I've been thinking a lot about the state of our industry, specifically how courses and clubs are closing due to financial troubles and being turned into housing communities, office buildings, even water parks. I recently saw that the leadership of one of golf's key organizations is calling for 1,000 courses to close for the "betterment of the game and the industry." So, we all have good reason to worry.

While at the Golf Industry Show, I ran into a friend from a high-profile club in South Florida. Looking around the convention floor he commented how much it disturbed him to know that many superintendents come to the show without having a shot in hell (or the money) to buy any of the equipment and other products on display. But rather than just complain, he was doing something about it.

He told me that he gives older or extra equipment and other things to clubs in his area that aren't as fortunate. For example, his club has him replace the flagsticks every six months: at $80 each, 20 flags, two and maybe three times per year. It's money his club is happy to spend. So, what does he do with the "old" sticks? He gives them to his friend, a super down the street at a daily-fee facility that in a good year can only afford to change flagsticks once.

Which got me thinking: Are we, as a profession, sharing enough?

Yes, we're quick to send our staff to "volunteer" at major tournaments, but to what end? Does this help our individual courses? Are we getting much more than some bragging rights? Yes, assistants and crew might gain some experience and enhance their networks, but at the end of the week, they come home and unless "home" is a club with money and the chance to host its own big events, how much good does that experience do? And fact is, the host course will be perfectly fine with or without our laborers pitching in.

No, if we really want to share — and I think we should, all of us, whatever we can spare — we need to find ways to help those clubs and superintendents who aren't as fortunate as we are. And I'm really calling out the top clubs, those that are the most affluent and prestigious, to give back or pay it forward or whatever you want to call it. They, most of all, should practice some "trickle-down" economics and help others.

If you have equipment that's being replaced, not in a lease package, and the manufacturer or distributor won't take it back, consider giving it to another club. This small gesture could significantly upgrade another course's maintenance practices and arsenal of tools.

Understand, this is not charity. Superintendents are a proud bunch and take great pride in doing the best they can with the resources they have.

This is about camaraderie and support, helping a fellow superintendent who, face it, isn't as lucky as you are. And who really benefits? The golfer and, ultimately, the whole game. If the patron of that daily-fee down the street has a better experience because the fairways or the greens are better conditioned, maybe he'll play a little more and maybe consider joining the private club. What trickles down can also move up the ladder.

Giving an extra piece of equipment, a case of fungicide, a bag of fertilizer, or some extra bunker rakes and ball washers to another club can help them look better, play better, and feel better about its place in the industry. Also, you've probably helped a fellow superintendent, and you never know if his/her job is in peril. One gesture can go a long way.

And something else. I'm not talking about emergency support after some sort of disaster, natural or man-made. This is about day-to-day assistance, unpublicized giving back to your friend, your community, your industry. Quietly helping someone so both parties feel better.

Other parts of the golf business already give back. We're all quick to give old clubs, bags, balls, even shoes to beginners and junior programs. Many clubs hire underprivileged kids to work in cart storage and dining rooms, introducing them to a game—and a world— they might otherwise never see. And we're all aware how much money the pro tours give to charities and they certainly aren't modest about it.

Well, I'm asking you to do this and be very modest about it.

It must start with superintendents (**MORAGHAN** *continues on page 48)*

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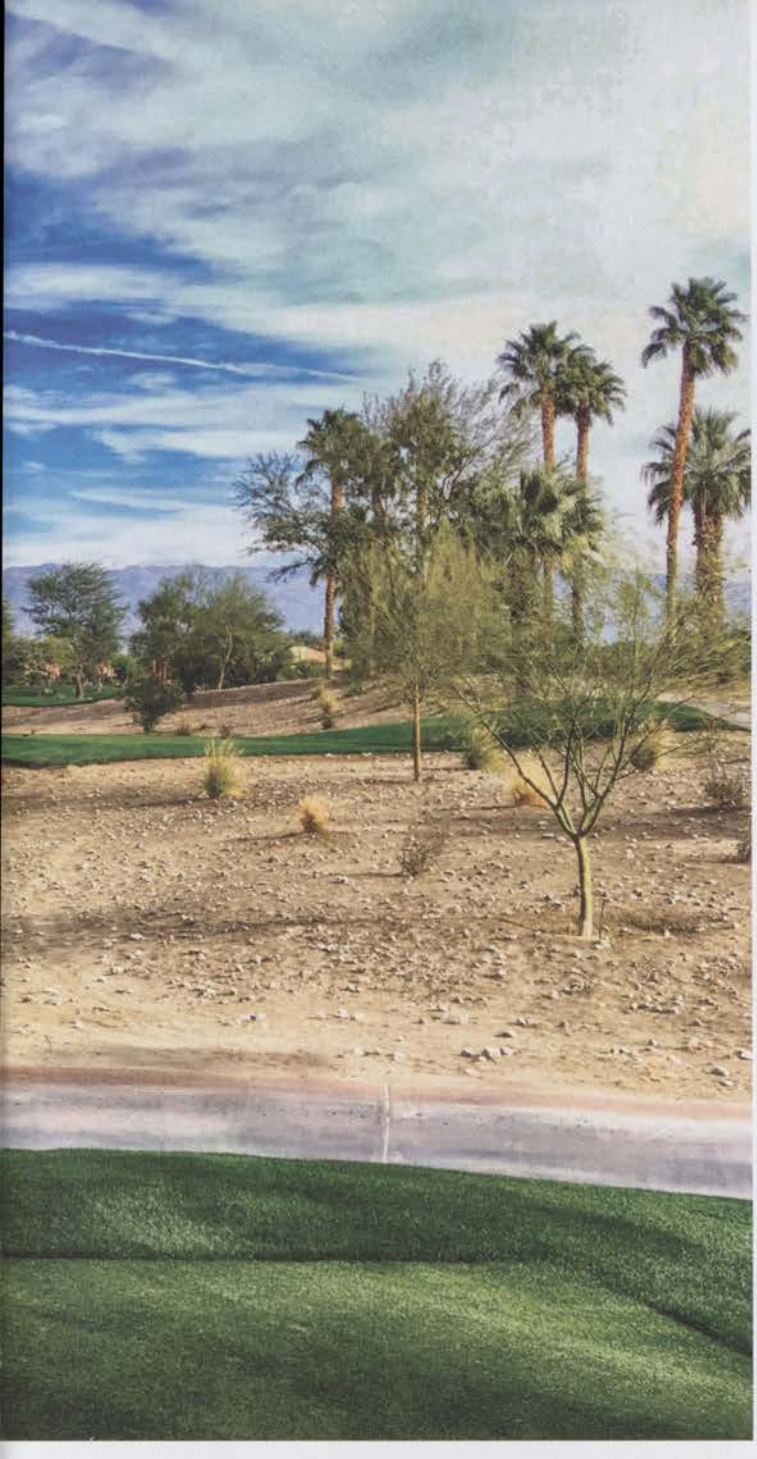


PIECES OF THE SAME PUZZLE

Superintendents are finding innovative ways to lead water-saving efforts in the demanding California desert. Their stories could help the next region facing a resource crunch.

By **Guy Cipriano**

Behind gates and walls, snugged between houses, and below mountains and omnipresent sun, rests one of the golf industry's biggest conundrums. A desert supports a vibrant and viable golf tapestry.

Tyler Tang spends a late-January afternoon zooming around The Club at Morningside in Rancho Mirage, Calif., explaining how he maintains a 140-acre golf course in a desert. Temperatures are in the low-70s as sun reflects off the bordering San Jacinto Mountains. Snowbirds three weeks into their transient winter existences pack a course opened in the early 1980s.

Weather is the top attraction in Rancho Mirage, one of nine cities comprising Southern California's Coachella Valley. With the weather, comes golf. Plenty of it. A 50-square mile stretch boasts 123 golf courses. Thousands of homes surround the courses and developers use phrases such as "deep emerald turf against

From top left to right: Rancho La Quinta Country Club, Bermuda Dunes Country Club, The Club at Morningside and Thunderbird Country Club. Superintendents at the four facilities have worked with club leadership, members and homeowners to reduce water usage.

ever-changing desert colors," "lush landscape palette" and "immaculately maintained" as marketing tools on club websites.

Back-porch aesthetics and decades-old promises place superintendents in tricky spots. Do too much to adapt a course to the surrounding environment and customers could purchase homes and memberships elsewhere. Yet changing little, or nothing, could place a facility in a tenuous spot. "By the time, you realize you should have been with the program, you're five to seven years out of date," says Craig Kessler, the Southern California Golf Association's director of government affairs and chair of the Coachella Valley Golf & Water Task Force.

Kessler made his comments at the second annual Coachella Valley Golf Industry Summit in late January. He warns state leaders are ready to pounce on the region whenever the next widespread drought intensifies. The Coachella Valley averages less than six inches of rain per year, so it can be argued the region never leaves drought.

A day after the summit, Tang drives his cart toward the corner of Country Club Drive and Highway 111, a sloping expanse offering outsiders a peek into The Club at Morningside. The entire 14th hole is visible from the intersection. The tee, fairway and green are a verdant green. The rough is a mix of green and brown. The club opted last fall against overseeding 35 acres that borders the 13th and 14th fairways and covers landing areas of the driving range.

"Everybody was on board with it," says Tang, the club's superintendence since 2015. "With what was in the media and newspapers, then (members) coming back and seeing how proactive we had been, they totally accepted it which is great. It's out of play, it's not backed up to anybody's home or lawn. That does help with the initial blow of having brown grass."

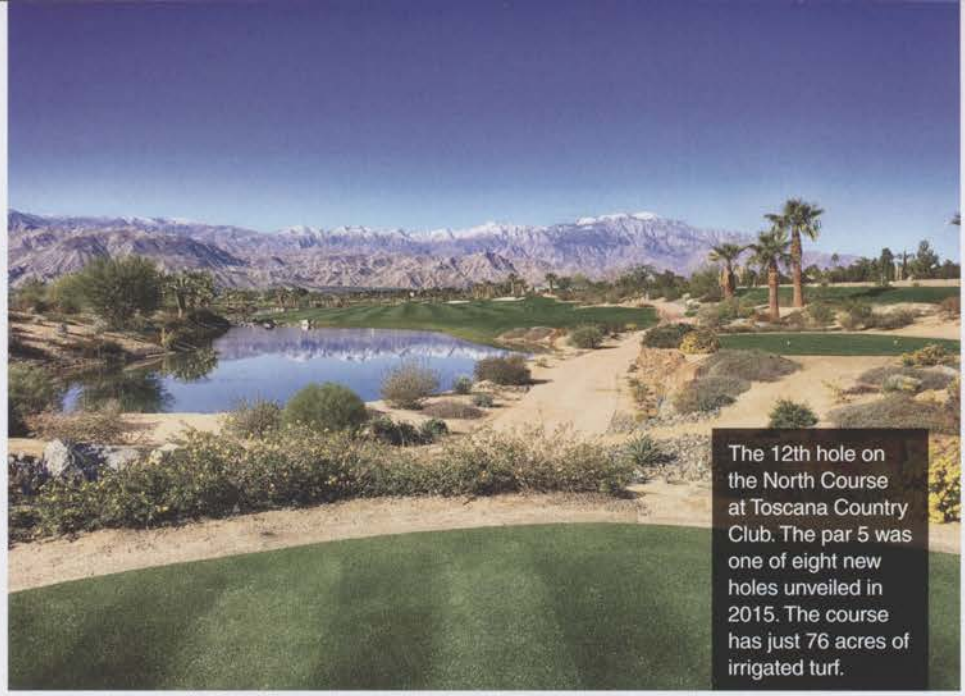
From discolored turf in wayward areas to replacing turf with desertscape along cart paths, tees and medians, superintendents are tactfully pursuing water-saving projects and practices once deemed risky in a competitive market. Methodical shifts are occurring despite favorable water prices and lenient conservation mandates, at least by California standards.

GCI spent two days earlier this winter observing Coachella Valley golf course maintenance and business practices. Lessons shared by proactive desert facilities can be applied wherever golf courses face scrutiny over water usage.

START NOW

Stu Rowland, the director of golf course operations at Rancho La Quinta Country Club, relishes conversations about golf's water usage. But when he arrived in the Coachella Valley in 2002, he fielded few questions about the subject. An expansive aquifer, longstanding access to Colorado River water through the All-American canal and water districts that understand how golf aesthetics attract residents shielded the Coachella Valley from issues facing other sunshine markets such as Los Angeles, San Diego, Las Vegas, Phoenix and Tucson.

"Nobody really talked about water," Rowland says. "Water was terribly cheap – really, really cheap. Unless you are



The 12th hole on the North Course at Toscana Country Club. The par 5 was one of eight new holes unveiled in 2015. The course has just 76 acres of irrigated turf.

CONTRASTING LOOKS

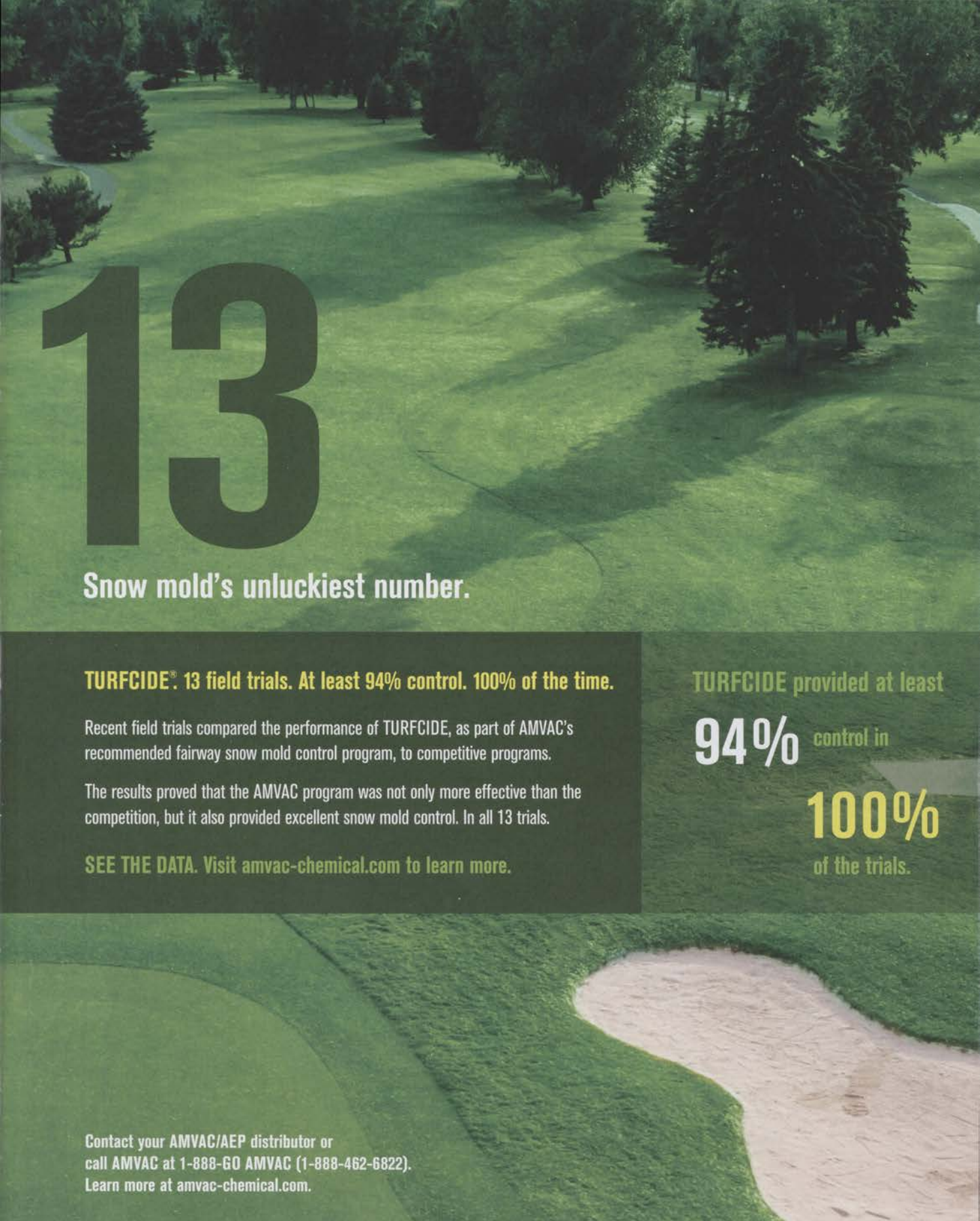
Rick Sall doesn't need to leave the property he manages to observe contrasts created because of water issues.

Sall is the vice president of golf course maintenance at 36-hole Toscana Country Club. The club opened the 18-hole South Course in 2004 and was swiftly moving toward unveiling a second 18. But the start of the recession halted construction on the North Course after the completion of 10 holes.

Construction resumed a decade later as the Coachella Valley real estate market started improving and the North Course opened in November 2015. The course includes just 76 acres of irrigated turf, compared to 130 acres for the South Course. Both courses are Jack Nicklaus Signature designs.

Turf acreage isn't the only contrast between the courses. Everything on the South Course, including 30 acres of landscape areas, uses overhead irrigation. "We have smaller heads that do the landscape," Sall says. "We have 30,000 roses. Or at least I stopped counting at 30,000." The North Course features 15 acres of desert-style landscape supported by drip irrigation, with 23,000 plants along the eight new holes. The plant density helps keep the native blow sand from affecting golfers or homeowners. Blow sand makes it challenging for the Coachella Valley to support limited-acreage courses, according to Sall.

"We don't have that native Arizona desert," he says. "If you just drive in here, the desert is really sparse. So, with the blow sand, you would have dust issues if you just have the native. That's why the resistance going to those style of courses is so great here."



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getting it for free or pumping out of a river like some other parts of the country, it was the next cheapest you could get."

A drought that started in 2012 and recently ended in most of California placed the region in the conservation spotlight. Media outlets started tossing haymakers at the Coachella Valley golf industry, using terms such as "sucking California dry," "slow to conserve" and "water guzzling" in headlines. Fair or not, superintendents hired to produce looks impossible to achieve without abundant water found themselves in an emotional debate extending beyond club walls. "We have this huge target, which I think is interesting because I have never met a superintendent that's excited about depleting a resource that helps him keep his job," Rowland says.

Rowland has worked with members and homeowners to conserve water without damaging the intent of the 393 acres and 36 holes his crew of 62 employees maintains. Rancho La Quinta pursued a water-driven project last summer when the crew replaced 3 ½ acres of maintained turf surrounding the 18th hole of the club's Jerry Pate-designed course with a variety of desert plants. The area is being watered using drip instead of overhead irrigation.

It's too soon to quantify the savings, but Rowland says installing drip irrigation and drought-tolerant plants in 32 acres of landscape areas contributed to the club saving 200 acre-feet of water in 2016. One acre-foot is equivalent to 325,851 gallons. Similar projects are being considered. When altering aesthetics because of water concerns, Rowland says it's important to provide clarity about the reasons behind the change and how it will impact the member and homeowner experience.

"Start now on what your contingency plan is," he says. "Have that communicated so that if there's a drought or water shortage everybody is on board with the plan and what the plan entails. When worst comes to worst, tell them this is what we are going to water and this is what we are not going to water and this is what it's going to look like so there's not that shock factor and knee-jerk reaction."

FOCUS ON PLAYING AREAS

Reliability is a staple of Coachella Valley golf. Members and homeowners arrive each winter expecting to see the same people and views they enjoyed the previous year.

Opened in 1959, Bermuda Dunes Country Club produced more than five decades of re-

peatable experiences. Bermuda Dunes served as one of the sites for the PGA Tour's desert tournament from 1960-2009. A group consisting of Gerald Ford, George H.W. Bush and Bill Clinton and defending tournament champ Scott Hoch joined tournament host Bob Hope for a pro-am round on the course in 1995.

Superintendent Chris Hoyer will likely never prepare Bermuda Dunes for three presidents, a cranky PGA Tour player and beloved entertainer. But he did usher the club through one of the biggest transformations in its venerable history.

Bermuda Dunes, a 27-hole facility with 185 maintained acres, halted wall-to-wall overseeding in 2015. With help from golf course architect Tim Jackson of Jackson Kahn Design, the club identified a water-saving model that would require one height of cut for all fairway, tee and approach turf. Eighty acres of playing areas are overseeded while the other 105 acres turn dormant. Uniform tees, fairways and approaches promote course setup flexibility and shotmaking versatility.

Hoyer, who arrived in 2015, used long-term thinking when explaining the changes to members. He knew the dormant Bermudagrass would initially struggle because of the toll decades of overseeding below trees exerted on turf. Seeding problem areas didn't work, so sod was needed to cover dirt patches.

"What was communicated – and it was overcommunicated over and over – was that we are going to strive to make sure the turf that we do overseed in the playability areas is the best (members) have seen because we knew the rough and other areas were going to struggle," Hoyer says. "Having that plan in place and presenting it to the membership was really beneficial for us as a management team to portray it, and say, 'This is how it's going to work.' We didn't want to overpromise and underdeliver."

Full Bermudagrass coverage in dormant areas has increased this winter to 90 percent, according to Hoyer. The changes position Bermuda Dunes to handle future conservation targets while saving the club more than $200,000 per year because of reduced water, seed, pesticide, labor, fertilizer and energy costs. Hoyer and his crew also replaced 2½ acres of maintained turf between the ninth green and a road leading to the clubhouse with desertscape as part of a Coachella Valley Water District rebate program offering courses $15,000 per acre for up to seven acres of removed turf.

"We wanted to get ahead of the 8-ball," Hoyer says. "We didn't want to be left behind saying, 'What are we doing to conserve water and meet our goal that we had set as an industry?'"

A DIFFERENT ERA

Across Country Club Drive from The Club at Morningside, sits Thunderbird Country Club, the Coachella Valley's first 18-hole course and a symbolic cog in regional golf discussions.

Lawrence Hughes, who worked as a construction supervisor under Donald Ross, cracked the opening tee shot on the Coachella Valley's first 18-hole course on Jan. 9, 1951. The club then blossomed as it hosted the 1955 Ryder Cup, inspired a name for a muscle car and employed an assistant pro who developed the golf cart. Gerald Ford, Bob Hope, Oscar Mayer, Barron Hilton, Ralph Kiner, Joseph Coors, Dean Martin, Perry Como, Hoagy Carmichael, Lucille Ball and Bing Crosby are on past membership rosters.

The Thunderbird model of stylish homes surrounded by manicured green created by founder Johnny Dawson provided a template for the Coachella Valley's ensuing golf and construction booms. Five other 18-hole courses opened in Coachella Valley during the 1950s. The number continued multiplying until golf construction slowed in the mid-2000s. Who knows what happens if others had not tried emulating what Dawson successfully created at Thunderbird? "I don't know what would be here if there was no golf," says superintendent Roger Compton, a Coachella Valley resident since 1979. "There might be agriculture, perhaps using the same amount of water, if not more."

Thunderbird's landscape is changing. Compton, in his 25th year as superintendent, stops two dozen times during an 18-hole show-and-tell of the club's recent water conservation efforts.

Before pausing behind the clubhouse, where his crew replaced 20,000 square feet of maintained turf with desertscape using drip irrigation, Compton reflects on the changes since he arrived in the Coachella Valley in 1979. "The biggest thing and I remember the saying because it came directly from the water district: 'Water is not an issue. We will never run short on water,'" he says. "We do have a lot of water, but we need to learn to conserve and try to keep that water table from lowering."

The cost of water in the Coachella Valley has quadrupled in the last 30 years, according to Compton, although courses are still paying less than $150 per acre-foot. Projected increases over the next five years are expected to be among the steepest in the region's history. Some courses on the California coast pay more than $1,000 per acre-foot. "We can't complain about the price for water," Compton says. Still, Compton ekes out savings wherever possible.

Turf between cart paths and walls is being removed. Last summer 1 ½ acres of irrigated turf in an area once supporting citrus trees between multiple front-nine tees was removed and replaced with desertscape. Compton is eyeing similar locations throughout the course for projects this summer. "We want to do some bigger areas," he says. "If you take an acre out, you are going to save about five acre-feet of water per year. That's a lot of water."

A recent summer project involved installing storm capturing capabilities in the wash area. A pump takes the water to a pond that distributes water into an irrigation lake. Compton estimates the pumping captures 10 to 15 acre-feet of storm water per year. "That's like getting three acres of landscape," he says. "It's something we would have never thought of doing 10 years ago."

Additional water-saving tactics include irrigating overseeded rough three or four times per week instead of daily, reducing non-peak season irrigation and allowing a 10-acre wash area to turn brown in the summer. Compton plans on working with a consultant to reconfigure the irrigation system and he's mulling installing soil moisture sensors below a few greens, tees and fairways.

"If every course just does a little bit ..." he says. "There are always going to be ones that don't. There's just nothing you can do about it." **GCI**

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IRRIGATION TRAINING

Brian Vinchesi, the 2015 Irrigation Association Industry Achievement Award winner, is President of Irrigation Consulting, Inc., a golf course irrigation design and consulting firm with offices in Pepperell, Massachusetts and Huntersville, North Carolina that designs golf course irrigation systems throughout the world. He can be reached at bvinchesi@irrigationconsulting.com or 978-433-8972 or followed on twitter @bvinchesi.

It's turf show/conference season again, and the conferences and shows offer a multitude of excellent educational sessions. These sessions are usually well attended, especially on the golf side, and provide not only an opportunity to obtain Continuing Education Units (CEUs), but opportunities to learn. These educational programs often have multiple tracks for golf, sports turf and landscape. The good ones also have a mechanics track.

I have noticed a lack of maintenance during my evaluation and audits of golf courses. This is no big news because most golf course irrigation maintenance is reactive, not proactive – fix what's broken not what's working. Lately, however, I've observed a lack of irrigation knowledge by the personnel doing the actual irrigation maintenance. So, how come when we go to a golf-oriented conference and show there is very limited education on irrigation and basically none about irrigation maintenance? There may be a short irrigation talk, but nothing of substance. Many times, the irrigation subject matter is new technology or equipment related, not maintenance related.

Why is irrigation training important? True to its name, an irrigation system is a "system." At some point, someone spent a considerable amount of time designing that "system" to make sure it operated correctly and applied water as uniformly and efficiently as possible given the equipment available at the time. Unfortunately, very small changes to an irrigation system will quickly make the system less uniform and efficient.

For example, the original design used a certain sprinkler model with a specific nozzle to operate at a set pressure. Put in the wrong nozzle, and the system is not the same. As a result, the precipitation rate changes as well as the distance of throw, how much water it uses and the uniformity.

Have you ever trained your irrigation technician or staff in making sure the nozzle replacement is the same as the nozzle that broke or blew out and is being replaced? I see many golf courses where the nozzle variation for the same sprinkler on a feature is all over the place. I recently visited a golf course where each fairway had all five available 670 nozzles in the fairway sprinklers. Along the same lines, the sprinkler needs to be set with the right pressure setting or you have the same issues as with the nozzle replacement. It is also important to replace sprinklers with the same model as they are all slightly different, although this poses a challenge with older systems.

What else do irrigation maintenance personnel need to be trained about? If your irrigation system has smaller sprinklers that are not valve-in-head, they need to know what match precipitation is and what the flow control on a valve is for. That way the block zones water evenly and the pressure is appropriate for the sprinklers installed. Does everyone working on the irrigation system know how to make a proper wire connection – extremely important on two-wire/decoder system – that is waterproof with a consistent connector used throughout the golf course? How about something as simple as a repair coupling? Are they using solvent weld cement fittings for repairs that should be done with ductile iron or gasketed repair couplings? Do they know the proper way to install a repair coupling so it doesn't stress the pipe and so it will last? Many golf course irrigation system repairs are repairs of previous repairs – hence the repair was probably not done correctly in the first place. Of course, there is my personnel pet peeve of keeping sprinklers level and at grade. That is preventive maintenance, not repair. Train your personnel to level and set sprinklers at grade when they are not repairing other parts of the system.

What about when there is a wiring issue? Do they just twin sprinklers together or do they track out the wires and find the issue? Does your staff routinely check the system operation to see if the sprinklers pop up and down, turn, and go on and off? Do you have your staff replace broken valve box covers routinely to reduce liability? Do they ever clean out the valve boxes? Do they exercise gate valves at least annually so they do not stick open or closed and when they replace them? Do you have them use a quality valve or whatever can be found?

The difference between reactive and proactive maintenance is whether your irrigation maintenance personnel take the quickest route to fixing a problem or they try and figure out what caused the problem and execute a repair that will last. **GCI**


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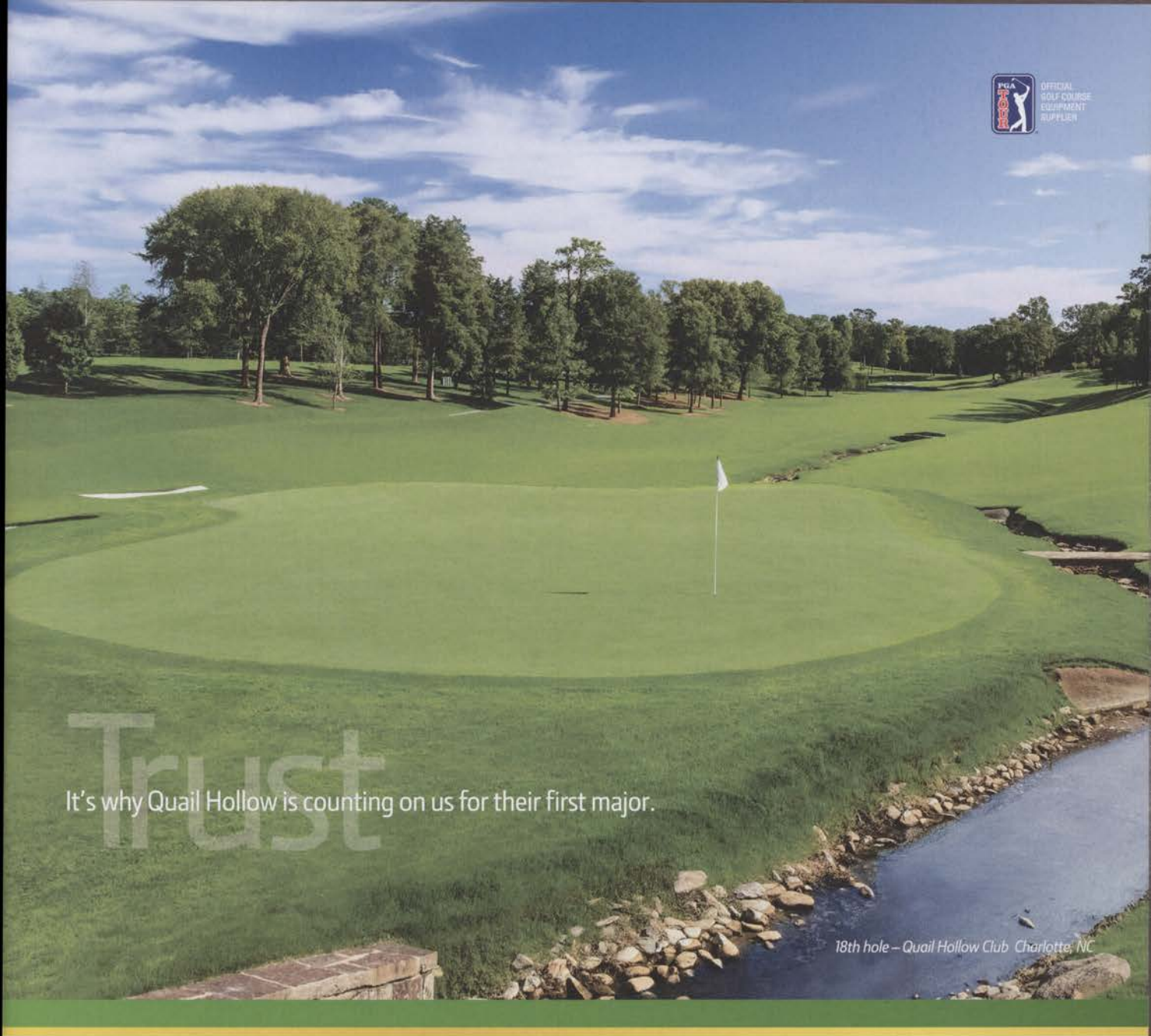
Winterkill doesn't come from a single culprit, but rather a combination of factors. Here are five key points to focus advanced planning and sound cultural practices to limit its impact.

By Rick Woelfel

Areas of your course with poor drainage, little or no snow cover, heavy thatch buildup, or are subject to heavy winter traffic are all prone to winterkill, a common problem for turf professionals in much of North America. While the causes vary, the solutions to mitigate this springtime turf problem are easy to attain.

TEMPERATURE

From fall to spring, particularly when there is no snow cover, cold temperatures threaten golf course turf in the northern latitudes. In some locales, particularly in Canada, superintendents cover their greens during the winter. University of Tennessee turf researcher Dr. John Sorochan is familiar with the practice. He grew up in Western Canada, where winter temperatures have reached 35



The PGA Championship is coming to Quail Hollow in 2017 for the first time ever and Superintendent Keith Wood and his crew have overseen a massive renovation on this pedigreed layout in Charlotte. They also have brought John Deere along for the run up to the championship. "I love the way that the John Deere mowers perform. I love the cutting units, especially the reel technology," says Keith. "When we use the A Model mowers, I'm even more impressed with some of the adjustments that we can make, thanks to the Tech Control display."

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"Using the snow covers can help insulate the surface and provide protective layers," he says. "If you had a snow cover, it adds a buffer from the really cold air temperatures."

The trick is covering greens at the right time to avoid turf damage, Sorochan says. For example, the covers must be removed if late fall or winter temperatures become unseasonably warm. Failing to do so would allow the air temperatures underneath the cover to rise to unacceptable levels. And if the greens are covered prematurely, the turf beneath may not shut itself down for the winter.

"In Calgary, we actually had to shovel snow off our greens to put the covers on them," Sorochan recalls. "You'd rather do that then put them on too soon and have the ground not freeze. You want it to freeze and get ready to harden off in the winter, but then you put the covers on them to keep them from getting exposed to too-low temperatures."

ICE

Ice is a major superintendent concern during the winter months. Prolonged ice cover is potentially catastrophic. However, some turfgrass species are more vulnerable than others.

For example, Kentucky bluegrass and creeping bentgrass survived for up to 150 days under ice cover without significant damage, according to a 1998 study conducted by Dr. James B Beard. Annual bluegrass, however, survived only 75 to 90 days, likely the result of toxic gas issues.

If ice persists to the point where the turf is at risk, the superintendent must do what is necessary.

"You want to do whatever you can do because one (issue) is gas exchange," Sorochan says. "You get lack of oxygen, and an accumulation of CO2. Cyanide has been known to kill bentgrass in Western Canada.

"I've seen some people do black-sand topdressing to kind of melt that ice a little bit, heat it up, do something if they can, to break up that ice layer," he adds.

CROWN HYDRATION

During the winter, temperature fluctuations will result in stretches of melting followed by re-freezing. Bermudagrass greens in northern climates are particularly susceptible to these dramatic shifts.

"Basically, the plant starts to grow again and the crown imbibes water," says Dr. Jim Kerns, assistant professor and extension specialist of turfgrass pathology at North Carolina State University. "Then, when cold temperatures occur, the water freezes inside the crown. As you can imagine this is fatal."

As is the case with an abundance of turf issues, preventative maintenance is key. The turf should contain the proper amount of moisture heading into the cold weather, Sorochan says. "You want to maintain low crown hydration," he says. "So, when they're going into winter, make sure (the turf) is not too wet, but not bone dry."

Striking the right balance between too much and two little moisture in the soil can be challenging, Sorochan adds, especially during a wet, rainy fall. It's important the turf — greens in particular — drains properly. "Good drainage and having proper drainage on your greens is a combination of surface and sub-surface drainage," he says so when it does get a lot of rain in the fall it's going to be slower to drain because of colder temperatures."

One way of reducing the risk of crown hydration during the winter is to avoid the temptation to put down too much nitrogen late in the season, Sorochan says. "You want to avoid late-fall nitrogen application," he adds. "You don't want it to become succulent, or get that late-season surge of growth. The plant's leaf blades can't harden off, the cells can't harden off to partition the energy to the crowns and the stolons and rhizomes to store for the winter."

DESICCATION

When cold winter temperatures and low-to-no snow combine with strong winds, turf can dry out and enter a state of extreme dryness known as desiccation. Concerns about desiccation explain why many superintendents are content to see snow covering their facility all winter long.

"It is very common in the Upper Plains states and Nebraska." Kerns says. "We also see this in Bermudagrass as well. Wetting agents and covers are very helpful to protect against this."

Areas most vulnerable to

WHAT COMES NEXT?

Determining if winterkill damage has occurred can be accomplished by taking samples from the suspect area and placing them indoors in a warm, sunny area. If green-up does not commence within a "couple of weeks," then the turf has been killed, according to the October 2005 Michigan State University Extension Bulletin.

From there, the superintendent must determine the extent of the damage. If it is minimal, the Purdue University Extension Service suggests applying pre-emergent herbicide after the spring green-up. Another option is tank-mixing a post-emergent herbicide in the tank as well or simply using Dimension (dithiopyr) since it has both pre- and post-emergent qualities.

If the damage is moderate, the Extension Service recommends re-growing damaged areas from sod, sprigs or seeds, or else simply letting the turf recover. In either case, the use of post-emergent herbicide is suggested as part of the recovery prescription.In the event of severe damage, the affected areas must be replanted.

Reestablishing turfgrass in damaged areas during the spring is challenging because the superintendent and his team must often deal with less-than-ideal growing conditions. A practical approach may be to strip the dead turf and re-sod, particularly when there are well-defined margins between dead and healthy turf.

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desiccation are open to the elements such as hills or areas that experience extreme temperature swings. The same topographic features that makes an area difficult to maintain in the summer, such as extensive tree cover, may help protect the area from desiccation. In addition, fencing installed around exposed areas will, in many circumstances, minimize the effects of the winds.

Even if the greens are covered for the winter, superintendents must be on their guard against snow mold. The most common U.S. varieties are pink (Microdochium patch or Microdochium nivale) and gray (Typhula blight or Typhula

NOWHERE TO HIDE

It's common for courses in the South and Southwest to be very busy during the winter months, thanks to mild weather. But a sudden cold snap can catch everyone off guard, including superintendents who may not have a lot of experience dealing with cold weather and, perhaps most importantly, are caring for Bermudagrass greens that are particularly vulnerable in the cold. If cold weather moves in, the superintendent must act fast.

The University of Tennessee's Dr. John Sorochan says it's important for golf course owners and operators in the Transition Zone to give their superintendents the resources they need to deal with cold-weather issues and for superintendents to communicate why those resources (read: dollars) are necessary.

"Bentgrass can survive minus-30 weather over the winter and come back," he says, "Whereas Bermudagrass won't survive, especially utradwarf on putting greens. You can get winterkill if you have (temperatures) in the teens or even the low 20s for a 24- to 48-hour period."

Superintendents can find themselves in a difficult position. If they don't cover greens, they're risking problems in the event of cold weather, Sorochan says. But problems can result if the covers are left on and temperatures rise.

"If you get warmer temperatures, you want to take those covers off," he says, "because you don't want those greens to heat up and start growing."

Superintendents who may not be accustomed to dealing with cold-weather scenarios can occasionally run into problems if they're tending Bermudagrass greens. "If you're from Florida and you come to the Transition Zone and you're not used to covering your greens and you're not used to winter prep in Northern climates, then you could really get in a lot of trouble," Sorochan says.

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A Deeper Respect

Pink snow mold could be a concern even if greens are covered throughout the winter.

incarnate or T. ishikariensis). The former is most prevalent in cool, humid climates; snow cover is not required. In fact, it can occur year-round, most often when the temperature is somewhere around the freezing point to 60 degrees. The latter thrives under a snow cover.

It's important for the superintendent to identify the species of snow mold he is dealing with. In many cases, this can be done by using a magnifying glass. Seeking assistance from, or providing samples to a turfgrass pathologist, will prove helpful, as well, according to the Purdue University Extension Service.

The best defense is a series of preventative fall fungicide applications, preferably after the season's final mowing, Kern says. "In climates with extended snow covers, two applications are sufficient," he says. "In the Pacific Northwest, multiple applications for pink snow mold may be needed."

It is important to note that the superintendent should utilize a product or blend of products appropriate to his environment and follow label directions.

MICROCLIMATES

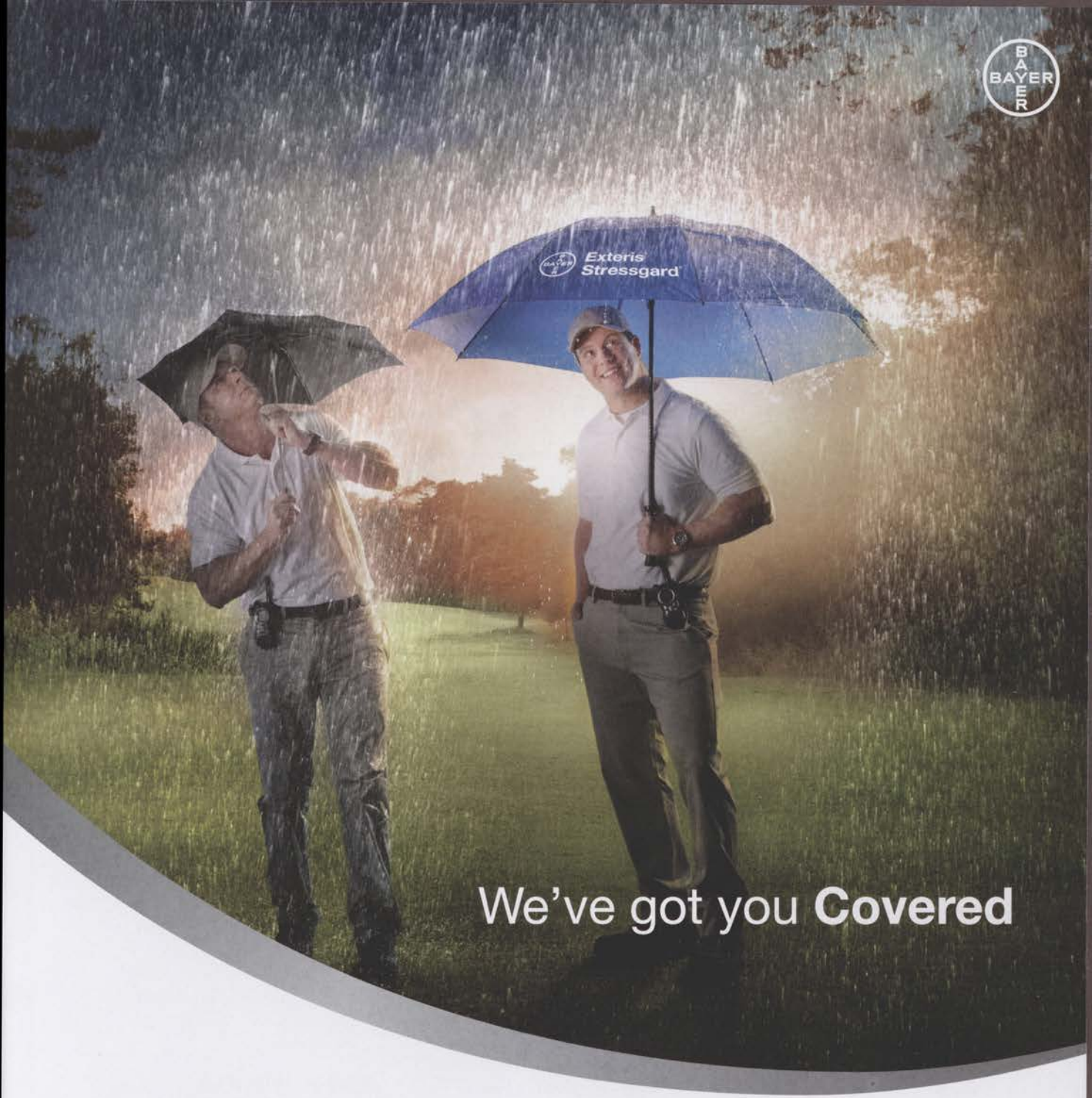
It's essential a superintendent is aware of what's going on throughout the property. The conditions on and around the seventh green may be quite different from those at the 11th tee. Be mindful of areas that may not get a lot of sun, which results in wet or damp conditions.

Microclimate is often left out of the conversation about winterkill, Kerns says. "Typically, winterkill only happens in certain areas on the course," he says. "I always advocate ensuring the plant gets adequate air, light, food and water … [which] help with winterkill prevention."

Microclimates have a big impact, says Dr. Kevin Frank, a Michigan State University turfgrass specialist who has observed differences in winterkill incidence between shaded and sunny greens. "Shaded sites usually have weaker turf and in many cases more *Poa*, thereby making them more susceptible to winterkill," he says. "Snow and/or ice usually persists longer on shaded sites also." **GCI**

Rick Woelfel is a Philadelphia-based writer and frequent GCI contributor.

PHOTO COURTESY OF SYNGENTA



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MY DEFINITION OF 'SHOT VALUES'

Jeffrey D. Brauer is a veteran golf course architect responsible for more than 50 new courses and more than 100 renovations. A member and past president of the American Society of Golf Course Architects, he is president of Jeffrey D. Brauer/GolfScapes in Arlington, Texas. Reach him at jeff@jeffreydbrauer.com.

Over time, I have developed my design-oriented view of "shot values" from amazingly consistent comments from tour pros and other good players. This provides me a tool for choosing the best design features. It could be a basis for a formal ratings system, but others can rate and analyze designs. I just design, striving to make as many shots as I can adhere to these parameters:

NO UNPLAYABLE/UNREASONABLY DIFFICULT SHOTS. They include impossible forced carries, targets behind mature trees or greens that are impossibly small or reject shots. It includes uncomfortable shots, with difficult "physics" such as an uphill long iron shot from a downhill lie, combinations of vertical challenges and shots over water/OB required to reach target.

TARGET VISIBILITY. There are exceptions, but blindness reduces strategy and pace of play, and sometimes increases safety problems.

TARGET ACCEPTS/HOLDS WELL-PLAYED SHOTS.

- Adequate size – Statistically sized, and about:
  - 15 percent width/20 percent depth of expected shot distance (average players)
  - 10 percent width/10 percent depth of expected shot distance (good players, used guarded "Sunday Pins")
  - Adjusted for typical wind conditions such as deeper greens on downwind shots accounting for less spin and wider greens in crosswinds.
  - Generally, angled less than 30 degrees right or left for playability.
- Contours with at least 1.5 percent upslope facing golfers and fairways with less than 10 percent cross slope depending on turf type.

OPTIONS WITH CONSEQUENCES.

- Two to three options on most tee shots, with a "best location" providing an approach shot that is shorter or from a better angle, a level lie, better vision or holding capacity, or taking major hazards out of play on either shot.
- On approach shots, a choice between "fat middle" area and "Sunday pin" target.
- A "bail out" area for any shot with difficult hazards.
- Balance of risk and reward. Risk proportion may rise near the end of the round.
- Create temptation and dilemma. High-risk shots should have 51 to 67 percent chance to succeed and reverse proportioned for recovery if missed. Use large 90 to 100 percent doable "safe" targets to accentuate the difference between safe and risky shots.

REWARD ONE "BEST" SHOT PATTERN ON EACH SHOT.

- Wherever possible, strongly align prevailing wind, lie and target angle to "signal" a preferred shot pattern. It reduces confusion and makes success a matter of execution and reduces luck. Setting up and rewarding one shot pattern on each shot requires golfers to "hit all the shots" over the course of the round.
- Even when favoring one shot pattern, leave enough room for others, as few golfers can hit all shots.

REWARD DIFFERENT RECOVERY SKILLS OVER 18 HOLES. Hazards should be a mix of different types and styles for visual and play variety. However, golfers who can hit "all the recovery shots" enjoy courses where they vary from hole to hole.

SHOT DIFFICULTY BALANCE/RELATIONSHIPS. While the occasional truly hard or easy hole stands out, most holes should have:

- Near average difficulty, with a mix of hard, medium difficulty and easier shots. Holes with difficult tee shots should have easier approach shots and/or putting. Where the long shots are relatively easy, putting can be relatively harder.
- Similarly, hazard difficulty should relate to shot difficulty.
- Hazards should be harder on wider fairways and bigger greens and easier on narrow fairways and small greens.

EXCEPTIONS TO THE RULES. Great holes first and foremost fit the land, and are aesthetic, sometimes at the expense of shot values. Using the land is the "first among equals" in design criteria. Many great old holes and courses break these rules. Some are even revered for it such as Olympic's "too narrow, too sloped" fairways or the Road Hole at St. Andrews. But, while those exceptions are cool, modern designers who break the "rules" too often usually create courses that are more goofy than great. **GCI**

Keep **Nitrile Gloves** on Hand

By **Mickey McCord**

Working on a golf course exposes your hands to a variety of substances. If you or anyone on your maintenance crew will be handling hazardous or questionable materials, then equip them with protective gloves. There are a couple of options, but nitrile gloves offer solid all-around protection and the edge over latex and other rubber gloves. Here are five fast reasons to stock your shop with nitrile gloves.

1 ONE SIZE DOES NOT FIT ALL

Nitrile gloves come in a variety of sizes, lengths, and thicknesses, some are even lined to provide more comfort and protection. Nitrile gloves are available in both disposable and reusable options.

2 PROTECTS IN MORE WAYS THAN ONE

Nitrile is a synthetic rubber compound and is more resistant to certain chemicals, oils, and even acids. Check the precautionary statement section of a hazardous material's label for required personal protective equipment (PPE). Nitrile gloves also provide an allergy-free alternative to latex, and are available powder free.

3 SUPER STRENGTH

Nitrile has superior strength, and is three times more puncture resistant than latex or vinyl gloves. Plus, if it does puncture, it rips completely, giving a clear indication of any loss of protection.

4 FEEL THE DIFFERENCE

Nitrile gloves combine excellent dexterity and sensitivity, with superior strength, making them a good choice for protection from incidental, or extended contact to many harmful chemicals.

5 A SOUND ALTERNATIVE

Nitrile gloves are inexpensive and important component of our maintenance team's PPE. Keeping several types on hand will allow your crew to choose the right option for the best protection.

You certainly want to keep your maintenance crews safe from harm, so be sure to have boxes of nitrile gloves, in a variety of sizes, onhand where laborers are sure to see and use them.

A 25-year career golf course superintendent, Mickey McCord is the founder of the maintenance crew safety training firm McCord Golf Services and Safety.

PREVENT DEFENSE

The most effective way to treat for grubs using today's insecticide technology is by using the preventive approach. Our experts outline how to keep them at bay.

By **Rob Thomas**

GRUB: © PERKMEUP | DREAMSTIME.COM; SOIL: © OLGA KOVALENKO | DREAMSTIME.COM

The primary and secondary damage done to golf courses by various beetles is devastating. Whether the larvae feed on the turf's root system or predators such as birds or skunks dig for them as a food source, the surface scarring is ugly, widespread and costly.

The most effective way to treat for grubs using today's insecticide technology is by using the preventive approach, especially if you know you have a history of white grubs on your course, says Jennifer Andon, program manager of the Ohio State University's Pesticide Safety Education Program.

"Neonicotinoid insecticides are still the least expensive products to use," Andon says. "Imidacloprid (Merit) or thiamethoxam (Meridian) are best put down in June into mid-July to prevent much of the damage you would see in the fall (at least here in Ohio). Clothianidin (Arena & Aloft) has a longer residual power and can be applied in May into mid-July.

"Ideally, you want to target the young instar larvae as they hatch and begin feeding," she says. "We've had very good results using neonics when applied during these windows. We've actually seen season-long control putting down chlorantraniliprole (Acelepryn) as early as mid-April, using the normal label rate."

Superintendents can still get grub control using this product when applied in June or July using half the label rate, Andon says. "This product is not very water soluble, so it takes a while to get to the soil-thatch zone, so the earlier you can get it applied the better," she says. "Acelepryn has very few non-target effects and has the lowest human toxicity level of all the grub insecticides, yet it is very effective, but this product will cost you."

The preventative approach is the key strategy for golf course superintendents, says Albrecht Koppenhofer, a specialist in turfgrass insect pest management in Rutgers' Department of Entomology. "Generally, use of synthetic insecticides has been most effective," he says. "The most effective among these tend to be the neonicotinoids (imidacloprid [Merit and many generics], thiamethoxam [Meridian, generics?], clothianidin [Arena, generics) and the anthranilic diamide chlorantraniliprole (Acelepryn)."

To be highly effective, the products must be applied in a preventive approach, ideally around the time when the female beetles lay her eggs and before the larger larvae start to show up, he says. "Hence, it is not possible to assess the grub densities before application, resulting in excessive use of these materials applied basically as an

insurance," Koppenhofer adds.

Curative approaches to damaged areas require applications of a material, like triclorfon, to those areas to eliminate the grubs, says Richard Buckley, director in the Plant Diagnostic Laboratory at Rutgers. "The advent of the neonicotinoids changed things a bit, so most folks use them as a preventive," he says. "We like to see turf managers map hot spots to restrict the amount of surface area being treated, but I am afraid many folks blanket treat regardless."

While there are myriad species of grubs, superintendents generally have not been forced to battle one type at a time, Koppenhofer says. "Most species have a very similar life cycle, give or take a few weeks —annual white grubs: Japanese beetle, masked chafers, oriental beetle, European chafer, green June beetle, Asiatic garden beetle," he says. "Only black turfgrass ataenius and May/June beetles (Phyllophaga species) have different life cycles. Most of the species are also similarly susceptible to the currently available synthetic insecticides."

Given the long residual of the primarily used preventive insecticides, it should be fairly easy to adjust for that, Koppenhofer says. "For example, black turfgrass ataenius can cause damage earlier in the year (has two generation per year)," he adds. "An application against the first generation would have to be a bit earlier than for annual white grubs. Many people apply the preventive material already early enough for that anyway, probably to get it out the way and because it is easier to water in application before things get drier in early summer."

As with anything, the "when" often matters as much as the "why" and "what."

"Timing is definitely important," Andon says. "Once you see damaged turf, it is often too late to treat and you will still likely have dead grass and/or animals digging for a tasty treat. The fat and sassy third instar larvae are much more difficult to control, especially as fall approaches. They stop feeding and start to descend into the soil for the ensuing winter. Once they stop feeding, an insecticide that has to be eaten (i.e., stomach poison) is no longer effective and you have to result to contact insecticides (think short residual) like trichlorfon (Dylox).

"We have also had fairly good control with Arena as a rescue treatment," she adds. "These products need to be watered in like mad to penetrate the soil and thatch to reach the critters, and still will only get you about

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70 percent control."

Controlling multiple species at once is best achieved early in the summer.

"Typically, we see a grub complex, rather than a single species of grub on our golf courses here in the Central Ohio area," Andon says. "It's usually pretty close to 60 percent Japanese Beetle, 40 percent Northern Masked chafers, with a few Phyllophaga (May/June Beetles), here and there. The further north you go (Cleveland area), you start to see more European chafers in the mix! These critters tend to stick around later in the fall and begin feeding earlier in the spring than the other grub species. We've actually seen southern masked chafers in our black light traps that really never occurred further north than Cincinnati, so the grub distributions are definitely shifting. If you make your June to mid-July application,

A shotgun approach

While there is no silver bullet for all pests, it is possible to combat more than one species at a time. It's all about timing, says Richard Buckley, director in the Plant Diagnostic Laboratory at Rutgers.

Buckley suggests to students that when picking a pesticide – particularly for highly maintained turf – choose products and timing to get the most bang for their buck. "For instance, the use of chlorantraniliprole in an annual bluegrass weevil program will pick up the black turf grass ataenius and other white grubs as well as cutworms and other lepids later in the season," he says. "On the flip side, we also stress that the applicator should be aware of unintended consequences. No need to kill pollinators or other beneficial insects."

Environmental concerns could affect the future of grub control, Buckley says. He suspects the use of traditional pesticides – for better or worse – will be curtailed via legislation. "The move toward biocontrol and least toxic materials will subsequently gain some traction," he says. "The efficacy of entomopathogenic nematodes appears quite good and if used in an integrated program can be as effective as an insecticide. I would like to see more superintendents try them for both their white grub issues and their annual bluegrass weevils."

Albrecht Koppenhofer, a specialist in turfgrass insect pest management in Rutgers' Department of Entomology, believes cost and politics may play factors in both the short-term and long-term future of grub control.

"The materials we have right now work well," he says. "Some companies might come up with some new materials related to chlorantraniliprole (Acelepryn). Nothing very different on the horizon as far as I am aware.

"If turf were to lose the neonicotinoids because of the whole bee/pollinator issue ... there would obviously be greater incentives to develop alternatives, be it new chemistries or invest more in biorational/biological control," Koppenhofer adds. "The alternatives we have currently are more expensive (than neonicotinoids) and some also more difficult to use, so that people will tend to continue using the synthetic insecticides as long as they can."

COURTESY OF JENNIFER ANDON

A preventative approach toward managing grubs on a golf course is the most effective way to maximize today's insecticide technology.

you will get good control of all these grubs."

For Buckley, the bottom line is continuing with best practices.

"I always think that the best control strategies are integrated," he says. "ID the main species, locate hot spots, determine when the adults are flying, then use the longer residual materials in the historical trouble areas (hot spots). Surely sound agronomics is important as well. Healthy, well maintained turfgrass can support higher populations of grubs." **GCI**

Rob Thomas is a Cleveland-based golf writer and frequent GCI contributor.

STANDARDS AND YOUR SUCCESS

Henry DeLozier is a principal in the Global Golf Advisors consultancy. DeLozier joined Global Golf Advisors in 2008 after nine years as the vice president of golf for Pulte Homes. He is a past president of the National Golf Course Owners Association's board of directors and serves on the PGA of America's Employers Advisory Council.

Before railroads spanned North America there were no time zones. As railroads began to shrink the travel time between cities, from days or months to mere hours, local times made scheduling a nightmare. Railroad timetables in major cities listed dozens of different arrival and departure times for the same train, each linked to its local destination. How could someone plan ahead or run the railroad on time when there were so many different times in play?

The solution was a uniform time-keeping system developed and introduced by the powerful railroad companies, which agreed to divide the continent into four – and eventually five – time zones that closely resemble those in place today.

Managing a golf course is a little different from running a railroad. But there is a similar need for uniformity and consistency. As with most things with lots of moving parts, multiple stakeholders and outside influences beyond your control, a smooth-running operation starts with a plan. For golf course superintendents, building a dependable agronomic plan requires extreme focus in two important areas: standards of excellence and standards of measurement.

STANDARDS OF EXCELLENCE. A baseline understanding is necessary to describe which standards of care and upkeep will be achieved and sustained. Establishing dependable standards requires several sub-plans:

- **Mowing and Cutting:** Describing how the greens, tees and fairways will be kept is a top priority. Good plans describe frequency, intended cutting heights and mowing patterns. Photographs help laymen understand the look, fit and finish the superintendent expects. Because of the manpower and money required, the mowing plan is the foundation of an overall agronomic plan.
- **Cultural Practices:** Aerification, verticutting and other mechanical programs reflect the facility's course philosophy; that is, how management wants the course to look and play. Implementing this philosophy to achieve the desired results requires precise description and illustration of each practice that management and crew understand completely.
- **Irrigation:** The efficient and sustainable use of water is mission-critical in most locales where water use regulation is commonplace. A good plan shows water usage by day as measured in gallons and dollars.
- **Fertility:** Increasing regulation demands that golf courses execute thorough planning and reporting of consumption and usage of all chemicals, especially pesticides and fertilizers. The agronomic plan is an ideal platform for superintendents to demonstrate their knowledge, expertise and commitment to sustainability.

In addition to these examples of sub-plans, superintendents must consider an arboreal plan to include the planting, feeding, pruning and removal of trees on and adjacent to the golf course. Describing how lakes and streams will be kept, preserved and cleaned is another important element of a comprehensive agronomic plan.

STANDARDS OF MEASUREMENT. In each section of the plan, superintendents should describe in words and images how standards of excellence will be maintained. These standards must be measured to be effectively managed because, as we often hear, things that get measured get managed. Here are three metrics to consider:

- **Units of Consumption:** A sound agronomic plan describes the volume of all consumables, including time and distance. This is where superintendents really shine. Demonstrate your scientific training and make it easy for your controller or finance committee to understand the depth of your knowledge and measurements that are most important to agronomic success.
- **Cost per Unit Consumed:** Connect consumption units to the budget with easy-to-follow calculations. Run the numbers and show how they were calculated. As all who do the work know, the granular consumption is where budgets either work or do not work. Use the measurements to educate those who supervise or opine on your work. Examples of cost-per-unit references are gallons-per-day for water, man-hours for the tasks required, and kilowatts consumed for running pumping and irrigation systems.
- **Labor Costs:** More than half of a typical golf course budget goes to labor. This segment is one that is escalating significantly. Describe the work that is being done, the cost per hour of the worker and the overhead calculations for benefits. The more thorough the detailed backup, the more powerful your argument. **GCI**

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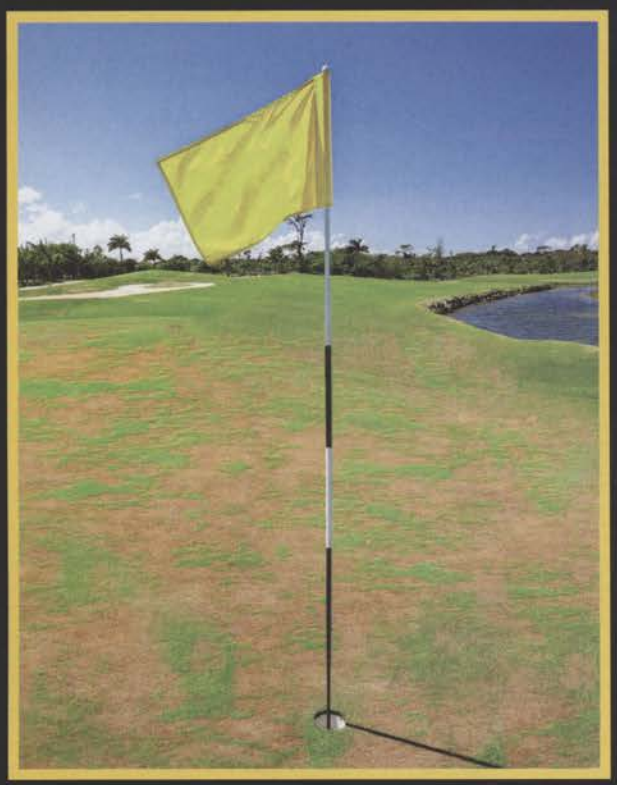

PYTHFUL or BLISSFUL?

ADVERTORIAL

King of the hill

Humidity and rainfall create the perfect conditions for Pythium root rot, a destructive disease that grows exponentially if unchecked. Segway, a QII fungicide from PBI-Gordon, leads the industry in managing the disease.

By **Patrick Williams**

When wet, humid weather persists for days, superintendents brace for Pythium root rot, a relentless soil-borne disease that appears in various climates and seasons and grows at an alarming rate.

Cool-season putting greens in the summer are particularly susceptible to Pythium root rot, says Dr. Jim Kerns, assistant professor and extension specialist of turfgrass pathology at North Carolina State University. Afternoon thunderstorms followed by several days of hot, dry weather provide perfect conditions for the disease, but it shows up in the event of limited rainfall if the air is humid enough.

"Typically, organic material favors the disease — any kind of wet, humid weather, most definitely," Kerns says. "Typically, on creeping bentgrass and annual bluegrass, where it's most prevalent, it's usually associated with heat stress."

When it comes to product applications to ward off Pythium root rot, Kerns says the PBI-Gordon fungicide Segway is "the king of the hill" because it has the broadest spectrum to fight against different Pythium root rot species, of which there are several. "It is what's called a QII inhibitor, so it basically prevents the pathogen from developing energy," he says. "It can't make its own energy; the fungicide shuts that down."

Once superintendents have performed soil tests and found

that Pythium root rot is infecting their turf, they will want to make a preventative application of Segway in the spring and continue applications throughout the summer, says Jim Goodrich, PBI-Gordon product manager of fungicides, insecticides and plant growth regulators.

The hotbed for Pythium root rot is in the Transition Zone, Kerns says. In North ern areas, such as the Upper Great Lakes and New England, the disease is rare, but still an issue. And although the disease is most common on cool-season turf, it has been appearing lately on ultradwarf Bermudagrasses.

Warning signs include the formation of irregular dew patterns in the early morning, Kerns says. These signs indicate the disease has damaged the plant's root, preventing the turf from taking up water. It leaves odd-shaped purple or purple-brown patches up to three inches in diameter, Kerns says. The diseased area can double the second day and triple the third. "It can move almost exponentially if those conditions are right, without some sort of protection there," he says. "Then it can develop into large, irregular areas of essentially just dead turf."

To culturally combat Pythium root rot, Kerns advises topdressing to increase infiltration rates and keep water out of the plant crowns. He recommends solid tining every two weeks in the summer and slightly increasing mowing heights and fertility rates.

Initially, many people used Segway at a rate of 0.9 ounces per thousand square feet, but Kerns and other researchers have found halving that rate provides the same control and allows for more applications. NCSU Researchers spray five to six times throughout the summer, separating applications out by about a month and rotating other Pythium chemistries between them. In other areas, such as Columbus, Ohio, superintendents might only need to spray three or four times a summer, and farther North, even less.

Many superintendents prefer to make a 0.9-ounce application at first to ensure strong control, and then switch to a 0.45- or 0.55-ounce rate for subsequent applications, Goodrich says. "There's alternate programs you can do," he says. "You can do a different approach, or you can just do the 0.9 three times throughout — 28 days apart, rotating with other chemistries, just to make sure you're putting out the most effective dosage to control the disease and get it stopped before it has any chance to progress."

The amount of disease pressure will determine application rates and frequencies, Goodrich says. If pressure is high, the highest rate possible works best.

Segway not only treats Pythium root rot, but all Pythium diseases, Goodrich says. Pythium root rot can develop a resistance to Segway, so superintendents need to rotate, Kerns says. "This is an excellent chemistry, and we still do have to be very cognizant of preventing resistance development because we don't really have anything as a viable alternative," he says. **GCI**

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Monroe Miller retired after 36 years as superintendent at Blackhawk CC in Madison, Wis. He is a recipient of the 2004 USGA Green Section Award, the 2009 GCSAA Col. John Morley DSA Award, and is the only superintendent in the Wisconsin Golf Hall of Fame. Reach him at groots@charter.net.

Paul Latshaw's selection to receive this year's Old Tom Morris Award is an honor well-deserved and a long time in coming. He's been at the top of our profession for decades, and he joins Sherwood Moore as the only golf course superintendents chosen among the 35 Old Tom recipients. There isn't a much higher honor in golf and these two guys are more than deserving.

Paul's selection got me thinking about what sets the very best superintendents apart from the rest of us. I've noticed some obvious characteristics.

Education is one. Whether it is from a major university program or from something other than that, good superintendents value not only higher education but also continuing education. They are good plantsmen and understand turfgrass growth and cultivation. They are engaged with their staff, players at their courses and colleagues in our profession.

They not only embrace technology, they often are creating it. Common sense is another common trait, and full engagement (hands-on) on all golf course activities is another. A strong work ethic, flexibility, focus and experience can be seen in these golf course managers. They all love golf, although not necessarily as a player.

But there is one thing the best superintendents possess in plentiful quantities. It is a special instinct that seems to be God given. Or maybe it is genetic. It's an instinct that could be called "turf clairvoyance." Some might call this "a sixth sense." People outside the profession likely would refer to it as a "green thumb." Whatever it is, it is well recognized, and not just among superintendents.

I recently attended a Wisconsin basketball booster group's meeting, and our head coach was talking about the shooting slump some of our players were in. He talked about emphasizing the elements of shooting – arc of the shot, position of the hands and feet, location on the floor, game score, and a dozen other factors. "In the end," he said, "I have to let them fall back to their shooting instincts."

Arnold Palmer, our first Old Tom Morris Award winner in 1983, wrote about instinct in his book, "A Life Well Played." In fact, he devotes a chapter to it. He wrote about his involvement with getting the Golf Channel started: "I think if there is any lesson at all with my involvement with Golf Channel, it's simply to trust your instincts." I think that is why the best superintendents do better than most. They have very keen golf turf instincts.

A group of Columbia University researchers found that the longer you mull over a decision, the more likely you are to choose the wrong option. Superintendents with good turf instincts will quickly consider their decision options and make a move. And it is usually the right move. They have learned to follow their instinct.

It isn't just colleagues at our biggest or most famous golf courses or courses that host major golf event each year. Over the 50 years that I have worked in golf turf, I have seen colleagues close to home with a sixth sense that led them to courageous and almost always the correct golf course decision. They have that turf instinct.

Years ago, during an incredibly hot, humid and droughty year, a Wisconsin colleague made a move that no one in the state had ever even imagined. He closed the course for a day in the summer. It was hot, dry, windy and humid; golf courses across the state were suffering. It was a time when there was far more *Poa annua* than there is now. Closing the course to ease stress, allowing his staff to do lots of syringing and hand watering made sense to him. Closing gave him every opportunity to suspend any mowing operations and not worry about playing conditions. He had the authority to close and he got support from the green committee chair. It worked beautifully and the course suffered far less than those who stayed open for play. When questioned about it, his reply was, "I had a hunch I had to do this." He followed his instinct.

I am sure you can see this trait in all professions. There are people who seem to nearly always make the right decision – farmers who know when to cut hay even though none of the neighbors are. Bankers often follow instincts on a loan and some investors have excellent instinct on where to put some money. Or a teacher who has a good feeling (instinct) about a struggling student who ultimately goes on to do great things.

As I look back, I now know what my dad meant when he told me: "When things get a little crazy or rushed or almost out of control, or when something has to be decided right now, trust your instinct."

It was good advice. **GCI**


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Travels with Terry

Globetrotting consulting agronomist Terry Buchen visits many golf courses annually with his digital camera in hand. He shares helpful ideas relating to maintenance equipment from the golf course superintendents he visits – as well as a few ideas of his own – with timely photos and captions that explore the changing world of golf course management.

Terry Buchen, CGCS, MG, is president of Golf Agronomy International. He's a 41-year, life member of the GCSAA. He can be reached at 757-561-7777 or terrybuchen@earthlink.net.

CUSTOM MIRRORS

All 21 Toro Workman turf vehicles have center-mounted front rear-view mirrors used when driving on development roads and for backing up when being parked at the maintenance building complex at The Reserve Club in Indian Wells, Calif. A Napa Mirror #97653 ($20.99) and the Napa Bracket Part #97828 ($27.77) is bolted to the front fascia. The two Larsen fertilizer spreader/seeders are used for winter overseeding and fertilizing of the Bermudagrass turf. The Napa Mirror #97653 ($20.99) is mounted onto the Napa Tripod Bracket #97678 ($54.09) that is placed on the rear of the spreader/seeder, which makes it quite easy for the operator to quickly view how much grass seed or fertilizer is left in the hopper. It took less than a half-hour to mount both mirror/bracket applications. Felix Milward is the superintendent and Miguel A. Flores is the assistant superintendent.

EQUIPMENT USAGE CONTROL

This employee personal usage control of string-line trimmers, edgers and hovercraft rotary mowers was put into place so the staff would not put them away broken – but instead they were taken to the mechanics for repair. Employees "checkout" and "check-in" equipment themselves with their name, equipment description, check-out and check-in times and supervisor's name on the clipboard form. This control procedure helps produce "personal responsibility" in the team effort – and it makes it much easier for an employee to approach the equipment managers without any backlash, knowing that putting it back "broken" would be subject to a reprimand. The pegboard comes in 4 foot by 8 foot sheets with matching-hole size brackets available at any local big box lumberyard/hardware store. Total cost was about $200 for the pegboard, brackets and clipboards, and it took a couple of hours to wall-mount them. This system has been used by Jim Vajen, director of golf course and community landscaping, at Fiddler's Creek, the Creek Course, in Naples, Fla., since the mid 1990s. Brian Weaver is the equipment manager and Richard Garcia is the assistant superintendent.

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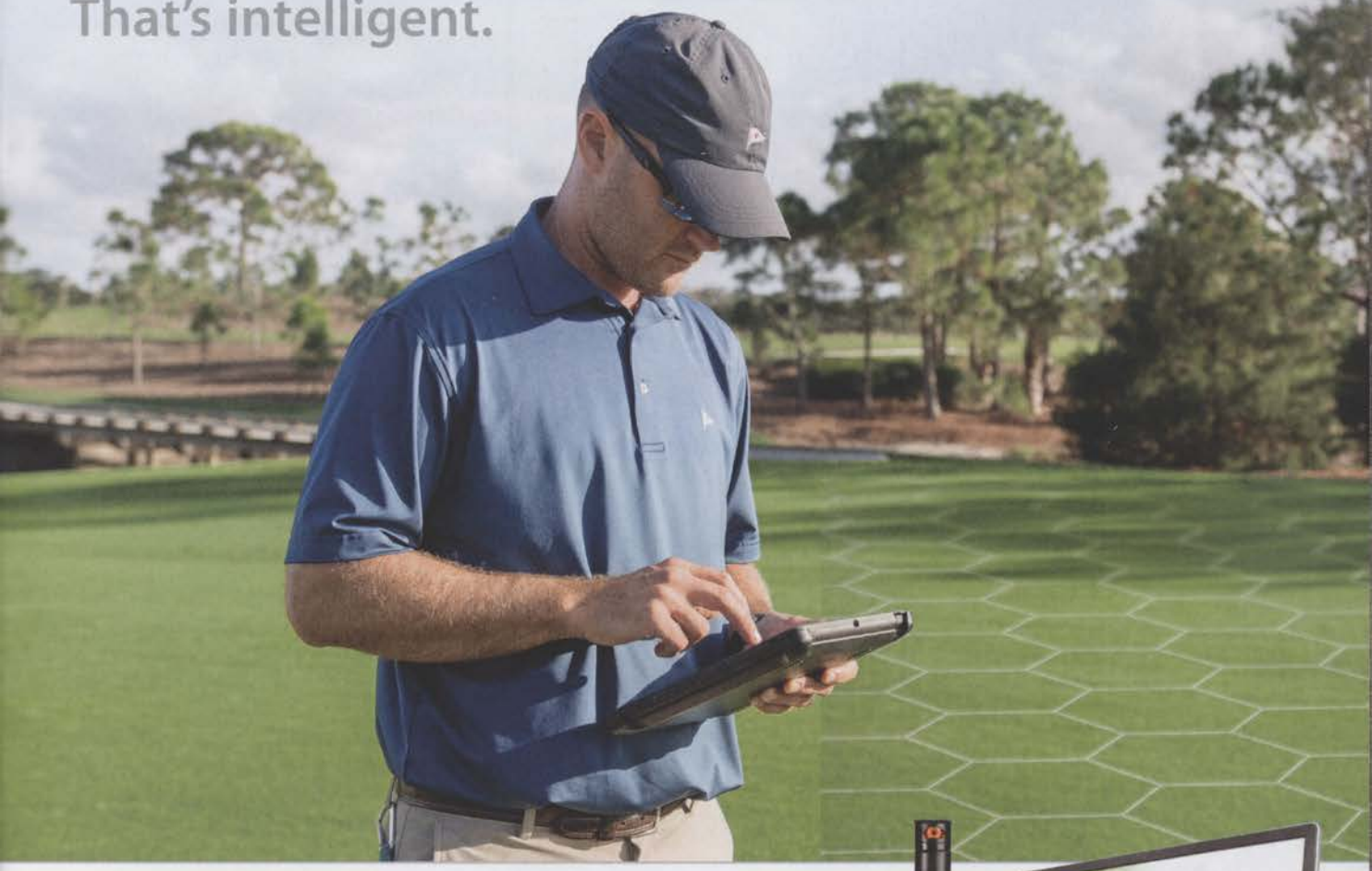

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FMC	fmcprosolutions.com	8, 25, 35
Foley United	foleyunited.com	7
Gempler's	gemplers.com	31
Greenworks	greenworkstools.com	2
Grigg Bros.	griggbros.com	11
Hunter	hunterindustries.com	5
Jacobsen	jacobsen.com	52

ADVERTISER	WEBSITE	PAGE
John Deere	JohnDeere.com/Golf	23
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PBI Gordon	GordonsProfessional.com	40, 41, 49*
Progressive Turf Equipment	ProgressiveTurfEquipment.com	26
Rain Bird	rainbird.com	47
SipcamRotam	sipcamrotam.com	51
SiteOne	SiteOne.com	45
Spectrum	specmeters.com	34
Syngenta	GreenCastOnline.com	cover tip
Trojan Battery	trojanbattery.com	19
Turf Diagnostics	turfdiag.com	16
Turfco	turfco.com	16, 37

(continued from page 10)

at the bigger, wealthier clubs, who need to lead by example. Look around the maintenance facility and ask yourself if that older mower, aerifier, sprayer or trailer is ever going to be used or can it help someone else? And you don't have to give away anything: How about lending a stump grinder or wood chipper to a neighboring club? It could save your fellow super a good amount of money.

At regional, district, or state association meetings, let other attendees know what you have or what you need, be it a spray tank, a greens mower, an aerifier, even a flagstick.

As for you guys working at smaller clubs, do not think of this as taking a hand out. View this as an opportunity to re-allocate your smaller budget to the greater benefit of your course and your members, customers, and guests.

Furthermore, don't be afraid to tap into your distributor network. There may be damaged packaging that the manufacturer won't take back. Tell your rep that you're always willing to pay a reduced price for slightly worn products. Stretch your budget and your connections.

Note to manufacturers, distributors, and salespeople: You know which are the wealthier clubs and which are having a harder time getting by. There's a lot you can do to help clubs with smaller budgets.

Our survival as a fragile industry is dependent on staying together, staying connected and helping one another wherever possible. We need to realize that our job isn't just taking care of our course, it's also helping others in the business.

Those of you who can use a hand need to think of it not as charity but as assistance and an investment someone else is making in you, your club, and the game. Don't waste an opportunity.

So, let's wave the flag and help one another. We all benefit when we work together and help one another. **GCI**

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PRACTICING WHAT I PREACH

Pat Jones is editorial director and publisher of Golf Course Industry. He can be reached at pjones@gie.net or 216-393-0253.

I just got into a big argument with some people on Facebook because I posted something about a politician who I thought was being hypocritical. Many folks agreed but some took issue and started beating me up about it. It was ugly.

Like most Facebook arguments, nobody won. Social media kerfluffles always remind me of something somebody told me years ago: avoid pissing matches because the only possible outcome is smelling like piss.

I swear – every time I get into one of these stupid online brouhahas – that I'll never do it again. I even teach it in my classes on social media: when you're online, remember the old rule about polite conversation and avoid politics, religion and sex. Yet, I inevitably fail to practice what I preach. I'm a terrible hypocrite about some things.

I try to get better about being less hypocritical every year but I always seem to find myself doing (or not doing) some of the things I preach about. Here's a few things I'd like to improve on.

Gratitude: For years, I've talked about the power of little handwritten thank-you notes in business and in life. Think about it: in the age of email, texts and social media, aren't you always surprised and delighted to get a handwritten note from someone?

I try to be good about saying thanks but my handwriting really stinks and it always takes me about three tries to write a decent note. At least that's my excuse.

So, from now on, no more excuses: I'm going to practice what I preach and write thank-you notes once a week.

Planning: In my seminars, I always harp on the value of planning. Set goals, define objectives, develop tactics to achieve your aims, etc. Do I do that? Hell no. I just fly by the seat of my pants way too much.

Frankly, I've been pretty successful trusting my gut and running and gunning … but that doesn't make it right. I'm constantly missing opportunities to promote what we do at GCI because I don't take the time to do some simple marketing stuff. That's kind of like you guys having crappy lawns at home. I'm really good at developing marketing programs for my clients but I stink at selling my own stuff. Kind of like that old axiom: the shoemaker's child has no shoes.

So, I'm going to get better at executing a marketing plan this year. In fact, I just spent 30 minutes building all of it into my calendar. Now I just have to stick to it.

Networking: Those of you who know me will find this ironic but I really don't have any formal networking program for myself. I mostly just show up at every single industry event and try to shake a bunch of hands. Yet I constantly tell young people or job seekers to have a list of people that can influence your career and reach out to them regularly. Again, failure to do what I tell others to do!

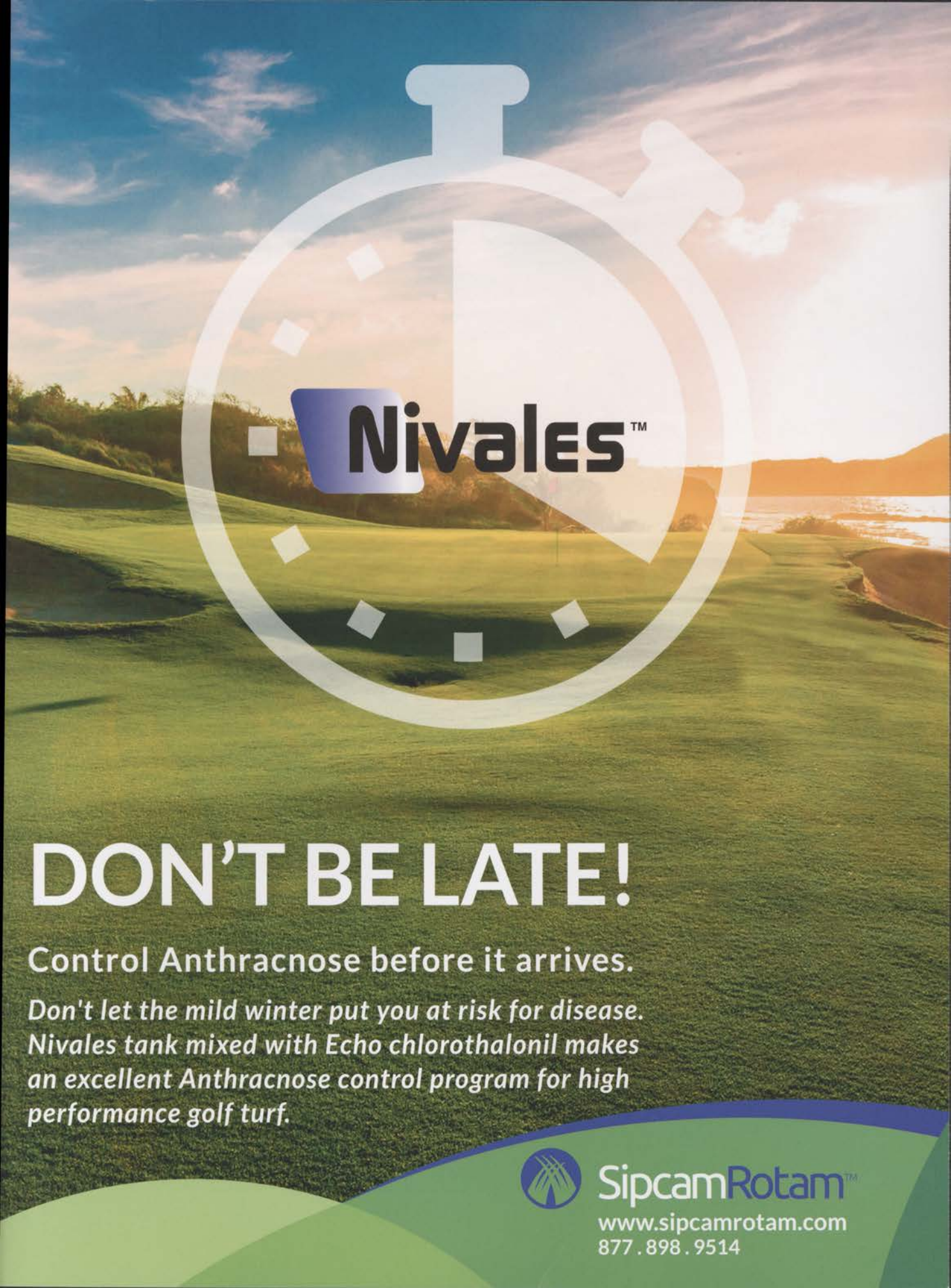
So, I spent part of last weekend making a list of 100 people in the industry that I wanted to get to know (or know better) this year. Most are successful supers I just haven't gotten a chance to meet in the past, but others are researchers, educators and people at various associations I would like to know. Why? Because the more connectivity you have, the more you can help others.

Be Mindful: One of the reasons I used to drink so much was a futile attempt to self-medicate for depression. Specifically, I tried to drown anxiety with gallons of beer and vodka. That didn't work out too well. For one thing, alcohol is a stimulant/depressant so it's not exactly recommended treatment for depression. And, guilt about drinking (and the consequences of being a drunk) just made my anxiety worse.

So, after seven years of sobriety, I try to practice mindfulness whenever that anxiety bubbles over. For me, that means trying to clear my mind and focus. Mostly, it's trying to just breathe and tell myself that everything will be all right. Whatever small, stupid thing is making me anxious will pass.

But, it's hard to remember to do those simple little mindfulness exercises. So, I did what these cool young folks are doing: I downloaded an app which, several times a day, dings and reminds me to do something simple yet important: Breathe. It calms me and takes me back to a good place instead of letting the anxiety put me into a downward spiral.

So, that's my plan for being a least a little less hypocritical every day. You can do it too if you like. Just think about one thing you preach but never seem to practice. Can you change? Try … and just breathe. **GCI**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