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A decade after the Great Recession, smart facilities are pouring millions into capital improvements and reshaping the golf market of the future.

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AMERICA'S GREENKEEPER

Changing demographics at Carolina Golf Club nudged superintendent Matthew Wharton toward social media.

His first blog post, "Maiden Voyage and Thanksgiving Tee Times," went live Nov. 21, 2011, beginning a digital journey intended to connect with a membership trending younger. Two years later, he joined Twitter. Wharton remembers his Twitter debut – a less than 140-character message declaring @CGCGreenkeeper as a spot to find updated course information between posts at carolinagreenkeeper.blogspot.com – and he likely remembers many of his 6,000 ensuing tweets.

Wharton consumes thousands of tweets, hundreds of blog posts and magazine pages, and attends multiple industry conferences each year. Somewhere en route to reaching the turf social media stratosphere, thousands of colleagues started consuming his content.

It's an odd transformation for somebody who still views social media as a forum to connect with members of a charming club in the shadows of Charlotte's high-rising skyline. "I have always strived to A.) Keep the message positive; and B.) Communicate with members," Wharton says. "If the industry likes it for another reason, then that's just icing on the cake."

Wharton generates "likes" at startling rates, thus making him an easy selection for the 2018 Kaminski Award, which will be awarded during #GCITweetUp18 at the Golf Industry Show. When it comes to social media, Carolina Golf Club Greenkeeper is America's Greenkeeper, an everyman superintendent who exudes positivity, creativity and humility via a smartphone and computer.

The industry can thank a Carolina Golf Club green committee chairman for suggesting Wharton might want to consider using social media to reach a membership with a decreasing average age. Wharton knows he's not being followed by all 500 members. But, as a rule, he crafts blog posts and tweets as if the entire membership was reading.

Assuming your membership consumes everything is good advice for social media novices. Remember that snarky tweet about the unraked bunker on No. 12? It's possible Mr. Footprint's 32-year-old member-member partner could be informing him of the superintendent's social media antics as they sip brandy on the patio.

Wharton never embarrasses members. Instead, he updates course conditions (Who knew they have regular frost delays in Charlotte?), explains cultural practices, shares industry literature and proudly illustrates the intricacies of a 1929 Donald Ross-designed course. He also uses social media to learn. Wharton discovered Frazee mowing via Twitter, asked around about it and decided to implement the tactic on the practice range tee, saving the club thousands by avoiding the costly renovation trifecta of stripping, laser leveling and sodding.

Following Wharton on Twitter and reading his blog is perhaps the industry's best glimpse at somebody who truly loves his job and the profession. Raised in small-town Virginia and educated at Virginia Tech, Wharton leads a team on land where Ross worked and prepares a course for a golf-loving membership. His office is a miniature turf golf course architecture and turf library, an orderly place where somebody with similar golf zest can spend days.

Only a small fraction of Wharton's 3,600 Twitter followers will ever visit Carolina Golf Club. Thanks to social media, every follower feels like they have experienced a Charlotte drought or toured the course with its head greenkeeper.

Legions are relating to Wharton's leadership.



Guy Cipriano
Senior Editor

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See page 11 for a full list of Super Social Media Award winners and GCI's events at GIS. GCI



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The good, the bad and the ugly

Nematodes dominate conversation at the 2018 Michigan Turfgrass Conference.

By Mike Zawacki



NEMATODES WERE THE TOPIC de jour at the 2018 Michigan Turfgrass Conference, and nematologists and turf research offered the latest news and insights (both good and bad) on management techniques, including the potential use of a fungus that attacks ring nematodes. And, yes, there were a number of stomach-turning, enhanced images of nematodes

doing their thing.

The conference, organized by the Michigan Turfgrass Foundation, took place Jan. 3-5 at Michigan State University's Kellogg Hotel & Conference Center. The foundation directly supports research at MSU's Turfgrass Research Program.

If you were hoping this winter's string of extremely low temperatures will curb spring

nematode populations, University of Rhode Island turf pathologist and nematologist Dr. Nathaniel Mitkowski says the cold hard facts are nematodes can weather the cold, even extreme cold, citing an especially frigid stretch in the Pittsburgh area two winters ago where the region experienced four weeks of 20 degrees or below temperatures. "Spring came and



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we didn't see a lot of mortality among nematode populations," he says. "Nematodes have the ability to survive a harsh winter ... And there is no correlation between low winter temperatures and nematode mortality."

And there are a few reasons why nematode populations are growing and spreading on golf courses. For example, topdressing, over time, has removed the harmful heavy metals from the soil profile that has kept nematode populations in check, Mitkowski says. In addition, the cultural trend of lower heights of cut stresses turf, which results in shallow roots susceptible to nematode infestation. But without a doubt, the loss of NemaCur has had an impact. Newer (safer) control options are more expensive and haven't had the same broad knockout punch.

Management options that may offer some control include: raising height of cut; reducing *Poa* invasion; establishing better rooting and plant health; and early soil sampling and treatment.

On the topic of nematode control, Dr. Billy Crow, University of Florida nematologist, commented

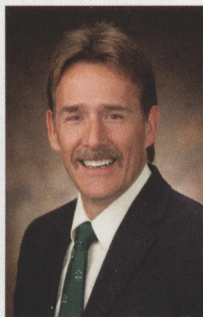
he is confident (and excited) that chemical companies have new nematicides in the pipeline for the turf industry.

In other conference news...

- Michigan State research may be busting a commonly held myth about irrigation timing, water rates and their impact on dollar spot. Popular thinking is that deep and infrequent watering will get turf roots to chase water into the ground, thus establishing deep rooting. However, recent research suggests that "deep and infrequent" resulted in the most instances of dollar spot when compared to turf plots that received daily irrigation, which had virtually no dollar spot. Researchers suggest daily, nighttime (10 p.m.) water of 1/10th of an inch to better manage dollar spot severity.
- The majority of renovation work on Michigan golf courses for the last five to seven years has centered around greens. One of the turf revelations to come out of this work addressed how to encourage maximum growth for a grow in. Researchers suggest keeping nitrogen levels high (between .2 - .25 lbs. N per 1000 sq. ft.) to get the turf seedlings growing, and added that there was no observable negative impact from using increased nitrogen levels.
- Ever wonder about the maintenance budget at St. Andrews? According to guest speaker Gordon Moir, director of greenkeeping, he manages a maintenance budget of around 4.6 million £, or roughly \$6.24 million USD. That total is for seven courses, including the famed Old Course.
- Watch the pH when you tank mix chemicals prior to application. You may start with a pH near neutral, but the addition of various products can bring those levels either up or down and can render AIs ineffective. The result: panic calls to supplier reps about why the product isn't working.
- Seeking a way to reverse green damage due to golf spikes? Researchers reported that staying on top of regular topdressing resulted in less visible wear on creeping bent and *Poa* greens.

Zawacki is GCI's editor.

Tartan Talks No. 18



Kevin Norby used an orange ball when playing his first round of golf. The course? Pebble Beach.

A landscape architecture major who attended South Dakota State University and the University of Idaho, Norby had never played golf until a memorable college trip to California's Monterrey Peninsula. Norby describes his path from Pebble Beach to forming a golf course architecture firm with Don Hertford in a Tartan Talks episode.

Norby runs his business from Chaska, Minn., the Minneapolis suburb where 2016 Ryder Cup host Hazeltine National Club is located, and works frequently in the Upper Midwest, where a short golf season doesn't suppress enthusiasm. Wetlands are common in the region and Norby describes on the podcast how working with environmental features can benefit a golf course. "It's hard to find a project that in some way

doesn't involve wetlands," he says.

The podcast also includes guidance on flood mitigation and rebuilding following a natural disaster. Enter goo.gl/QjqosP into your web browser to hear Norby's thoughts.



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Creeping Bentgrass Fairway

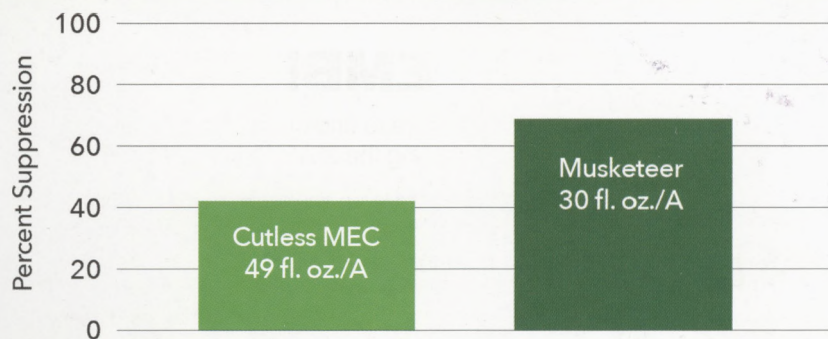


Figure 1. Maximum growth suppression of a creeping bentgrass fairway following PGR application. Notice Cutless MEC regulates creeping bentgrass growth less than Musketeer while both significantly suppress *Poa annua* growth (Figure 2).



Non-treated



Cutless MEC 41 fl. oz./A



Musketeer 35 fl. oz./A

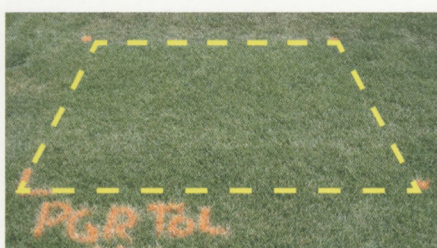


Trinexapac-ethyl 22 fl. oz./A

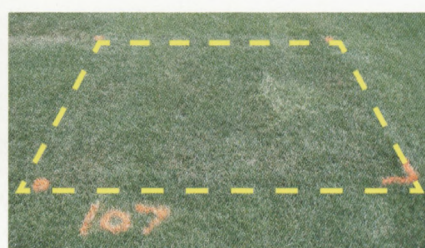


Prohexadione-Ca 25 oz./A

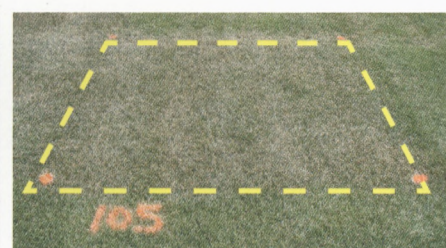
Figure 2. *Poa annua* suppression following PGR application. Photos taken 36 days after treatment.



Non-treated



Musketeer 36 fl. oz./A



Paclobutrazol 36 fl. oz./A

Figure 3. Kentucky bluegrass turf safety following PGR application. Notice lack of injury following Musketeer application compared to paclobutrazol alone.

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Overheard and observations at SBI17



The 2017 Syngenta Business Institute brought a inquisitive group of superintendents to Wake Forest.

Labor was the topic of interest with the 2017 class of superintendents attending the Syngenta Business Institute Dec. 4-7 at Wake Forest University.

For the last decade, Syngenta has partnered with Wake Forest's School of Business professors who teach a program focused on interpersonal and intergenerational communication, financial management and budgeting, delegation, and negotiation tactics. Superintendents apply to attend SBI, and Syngenta hand picks 26 attendees.

Here are some takeaways from this year's event:

- Superintendents lament over the fact that labor is in such short supply, often blaming housing surges in their markets for poaching labor. Many are forced to pay record wages to secure their turf management teams.
- Speaking of labor, assistant superintendents are in short supply in the Midwest. According to attendees, not only are turf schools not churning out the number of junior turfheads like they had in the past, but these graduates instead head toward the East and West Coasts in pursuit of internships and jobs, leaving a large hole in the middle for talent. One Michigan turf manager said he was forced to promote a long-term laborer into the assistant position because pickings are so slim in his market.
- When it came to intergenerational relationship building, much of the conversation was steered toward how younger superintendents can better manage laborers who may be 20-plus years their senior. To further complicate matters, some of the older laborers are retired former superintendents. Junior superintendents were intent on learning skills to overcome anxiety and better manage those who have "been there, done that."

REMEMBER GCI

How and where to find our team and digital coverage during the 2018 Golf Industry Show.

GCI is preparing to two-step its way into Texas with a variety of events designed to enhance the 2018 Golf Industry Show experience.

Our base Feb. 7-8 will be booth #9082 inside San Antonio's Henry B. Gonzalez Convention Center. Visitors can interact with GCI editors and personalities, offer story ideas, subscribe to the magazine, and obtain copies of the popular State of the Industry and Turfheads Take Over issues.

The booth is a Facebook-, Twitter- and selfie-friendly zone, although the social media highlight begins at 3 p.m. Wednesday, 7 with the presentation of the seventh annual Super Social Media Awards at #GCITweetUp18. A Happy Hour featuring free drinks and live music proceeds the ceremonies at 2 p.m. Aquatrols booth #5097 is the site of the festivities. For those who can't make it to San Antonio, use #GCITweetUp18 to follow along.

Coverage from San Antonio can be followed via @GCI-Magazine on Twitter and on our Facebook page. GCI is also producing two newsletters about GIS-related happenings.



2018 SUPER SOCIAL MEDIA AWARD WINNERS

Kaminski Award

Matthew Wharton, *Carolina Golf Club, Charlotte, N.C.*

Best Overall Use of Social Media

Ian Andrew, *Ian Andrew Golf Design, Brantford, Ontario*
St. Andrews Turf Team, *St. Andrews, Scotland*

Best Twitter Feed

Steve Hammon, *Traverse City Golf & Country Club, Traverse City, Mich.*

Steve Wright, *Pine Tree Golf Club, Boynton Beach, Fla.*

Best Blog

Chris Harriman, *Cattail Creek Country Club, Glenwood, Md.*
Richard Johnstone, *Nairn Dunbar Golf Links, Nairn, Scotland*

Best Use of Video

Atlantic Golf Course Superintendents Association,
"Deep Roots"

Megaphone Award for Hurricane Recovery

South Texas Superintendents



THE GRAINYS — 2017 EDITION



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

We had a lot to celebrate in the golf world this year — and more than a little to laugh at — so welcome again to The Grainys, my highly subjective awards for the best and worst of the golf season just past. I promise that no one was fondled, groped or coerced during the balloting (although I did notice a few courses that could do with a little extra irrigation). The envelopes, please....

BEST (OR WORST) HORROR SHOW

The Lexi Thompson ruling at ANA Inspiration, which is an uninspiring name for what used to be the Nabisco Dinah Shore. Even Lexi herself likened the four-shot penalty experience — called in by a television viewer, no less — to a nightmare. Friday the 13th fell on a Sunday this year.

BEST CINEMATOGRAPHY — BUT WORST RESULT

HDTV, 4D, OLED and screens of 60

inches and more were able to pinpoint every flaw in turfgrass, players' complexions and commentators mis-views. Technology becomes our worst enemy. (See "Horror Show," above.)

WORST SOUND MIXING

When are television announcers going to do their homework and accurately explain how courses are set up and conditioned for tournament golf? Might I suggest that they remove the uncultivated organic matter from between their ears and actually talk to someone on the ground? Instead, their misinformation and glaring mistakes prevent the viewing audience from grasping some basic agronomic facts, which is making life hell for superintendents at thousands of everyday clubs around the country. Thanks for nothing, guys!

BEST DIRECTOR: KEITH WOOD, GOLF COURSE SUPERINTENDENT AT QUAIL HOLLOW

Not only was the PGA Championship exciting to watch — particularly for an "August" major — give Keith and benevolent dictator Johnny Harris credit for needing a mere 95 days to put their golf course through all phases of construction and showcase it under exquisite championship conditions for the PGA of America. The course identified a great champion in Justin Thomas, whose father and grandfather are golf professionals (nice touch!), while Keith showed the world what a superintendent can do under extreme pressure in a very short time frame when given the resources and support.

BEST UNADAPTED SCREENPLAY: THE RULES OF GOLF

Opening up the Rules for review is a ruse to make us think we're actually part of the game. But as we all know, or should by now, the governing bodies will do exactly what they want to do. Maybe, just maybe they can make The Rules easier for their "Joe-Six

Pack's" among us.

BEST ORIGINAL MUSICAL

Make that "Musical Chairs." Paul Latshaw Jr. to Merion, Chad Mark to Muirfield Village Golf Club from Inverness, John Zimmers to Inverness from Oakmont, Dave Delsandro moved up at Oakmont. What's this, "Groundhog Day?"

WORST SUPPORTING ACTRESS

Fox Sports misidentified U.S. Open champion Brooks Koepka's girlfriend. Oops!

BEST PRODUCTION DESIGN

Golf finally got its tournament calendar correct. As of 2019, the year will start with the "fifth major" also known as The Players Championship, followed by the Masters, a May PGA Championship, the U.S. Open and then The Open. Kudos to Pete Bevacqua of the PGA, with an assist from the PGA Tour, for getting it right. At last.

BEST VISUAL EFFECTS [OR MORE ACCURATELY, WORST EDITING]

What could be prettier than flowing fields of fescue? Tell that to the USGA, which decided to mow them down during practice rounds for the U.S. Open at Erin Hills. Seems the stars didn't like the set: The players complained early in the week and the USGA folded like an empty box of popcorn. And how did it become an issue on Tuesday when it wasn't an issue the day before? Also, the fairways were 60 yards wide; why was the fescue even an issue? Giving Erin Hills this unnecessary haircut turned it into a vanilla — at best — U.S. Open venue. But don't blame the course or the barbers (Ground staff): Blame the stylist ... and the crybabies in the barber's chair.

BEST CINEMATOGRAPHY: GCS GREG

JAMES AND THE PGA TOUR

For the Presidents Cup, the oft-maligned Liberty National Golf Club was re-routed so it ended on a par 3, a questionable move ... until you saw the gleaming Manhattan skyline and Lady Liberty herself in the distance. It made for great television and almost made us forget the competition itself was a yawn.



BEST PRODUCER

Architect Mike Hurzdan designed Erin Hills to be a "Shinnecock with balls." Hmm, I've heard that quote before. Great idea, but without wind and/or wet conditions, course was emasculated and soft. A for Effort, but D- for execution.

BEST FOREIGN FILM: THE OPEN

It was great drama until it was comedy. Such was the plight of two Americans playing head-to-head in a foreign land — the 146th Open at Royal Birkdale. By using the Rules to his advantage, Jordan Spieth cleverly (but slowly) got relief from a TV tower, swinging the momentum in his favor and edging out Matt Kuchar.

BEST NEW TECHNOLOGY: WEEDIT

Call it "Boom Envy." WEEDit has developed GPS-directed sprayers on an 80-foot boom that can apply chemicals from an individual nozzle and target individual weeds using infrared sensors to nail the suckers as small as the size of a nickel.

BEST SHORT STORY: TIGER WOODS

He came back, played a "friendly" 72 holes at eight under par, and left us wanting more. It would be great if this teaser turns into a full-length production. Golf could use a mega-hit.

WORST SEQUELS

Week after week after week. Does the golf season never end? The wrap-around schedule deserves a rap in the mouth. Please, make it stop already, and stop trying to compete with the NFL. We can't win. At least our golfers don't take a knee during the national anthem.

WORST SEQUELS, PART 2: SUSTAINABILITY

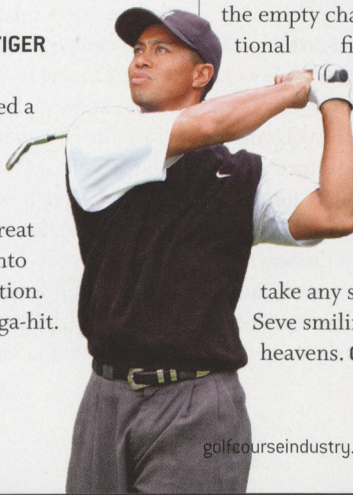
Yep, okay, we got it. We know, stop telling us. We have to maintain golf courses today without jeopardizing the future. Save water, reduce fertility inputs and improve the environment where our courses exist. We agree. It's common sense. And sooner or later there'll be an app for it.

SHAMELESS OVER-PRODUCTION AWARD

My prediction for the new year: The word you're going to come to hate is "iconic." Count the number of times you hear this word in the next six months, specifically to describe Shinnecock Hills, site the 2018 U.S. Open. But let's make this fun: Every time you hear the word iconic, feel free to take a sip of your favorite iconic adult beverage. You'll be flat on your ass, iconic or not, by June 17.

BEST PICTURE: THE MASTERS

We may have to retire this award. Once again, the Masters shows that they are the best at what they do and no one else even comes close. Billy Payne ended his chairmanship in perfect fashion and with cinematic flair: the empty chair for Arnie, the emotional first tee ceremony, and a fantastic finish that went to extra holes as Sergio Garcia went mano-a-mano with Justin Rose to break through for his first major win. It didn't take any special effects to see Seve smiling down from the heavens. GCI



CLUBS AND COURSES – IS THE MIDDLE CLASS DISAPPEARING?



Larry Hirsh, CRE, MAI, SGA, is the president of Golf Property Analysts in Conshohocken, Pa.

Much has been written about golf being an elitist activity, about it being too expensive for the masses and the resulting decline in participation. I've written extensively (<http://golfprop.com/blog/>) about broadening golf's appeal to the "3-M's". As I see it, a big part of the problem is that just like our societal shift in distribution of wealth, more seems to be going to the top.

When I look back over the past few years at our appraisal, consulting and brokerage assignments, there is a clear distinction between the upscale private clubs (which are performing favorably) with the mid-market and affordable clubs (which aren't faring as well). This is consistent in other areas as well, where upscale restaurants like Del Frisco's and Capital Grille, are thriving while Red Lobster and Olive Garden are struggling. Have you noticed that there's rarely an empty seat in First Class lately?

We all know that golf courses are closing at record rates, but do we know which ones? While it is true that some of the closures are upscale, in some cases "destination" courses, like Wynn in Las Vegas and Glen Abbey in Toronto, and several well-known courses in the Myrtle Beach area, many of the courses closing are middle market and affordable private clubs and middle market daily-fee fa-

cilities. In most markets, the upscale, sometimes iconic and prestigious private clubs are thriving and rounds are up at many municipal courses. Golf for the middle class is disappearing.

After a long growth period from the 1950s and '60s originally spearheaded by Arnold Palmer and later Tiger Woods, is golf returning to its elitist roots? In 1960, slightly more than half of U.S. courses were private. At the end of 2016, about 25 percent were private. Over the same period, the number of municipal courses grew from roughly 900 to about 2,500 and from roughly 14 percent to 17 percent of the national total. While it is unlikely that affordable golf will disappear, it is clear that middle market private clubs and those daily-fee courses serving the mid-market are challenged. The "working man's" private club seems to be particularly challenged.

Whether these clubs close and cease operations in favor of alternative use development, the members sell to management firms or the clubs convert to a semi-private or daily-fee model, these clubs are most definitely a casualty of current market conditions. Why?

I've observed the following issues that seem to impact middle-market clubs the most:

Governance. Either club leaders stay too long or they change every year. Therefore, there's no leadership

or leadership that becomes stale.

Reinvestment. Those clubs that need capital investment the most can't afford it or decline to invest, thus continuing their downward spiral.

Evolution. Many clubs become obsessed with tradition and history, often ignoring the desires of today's members. They refuse to evolve and include facilities, programs and groups that would enhance the club's prospects for economic success.

It is essential for clubs to understand their goals and objectives. I like to say that a club needs to know what it wants to be when it grows up. Every club needs to be realistic about establishing those goals. A club's facilities, location, competitive market and membership makeup all need to be considered, and it is not uncommon to see clubs either reach too high beyond their capability or elect to control their pricing by avoiding upgrades and enhancements. In those instances, the club often declines physically and economically to a point where there's little reason for anyone to join. With most markets having multiple clubs to choose from, the exodus begins to the other clubs.

Private golf, which basically exists for uninhibited access, is expensive by nature. There is a place for the middle class, but making it too cheap usually fails and making it too expensive results in a limited market. It is my sincere belief that private golf in the U.S. has succumbed to the social pressures of creating an "exclusive" atmosphere and to the "Augusta Syndrome" which motivates many clubs to spend too much on golf course maintenance. Like most golfers, I enjoy the near perfect conditions experienced at my club on a regular basis. I'm willing to pay for it. At many clubs, membership seeks those same conditions but isn't willing to pay for it. If golf's middle class is to survive, we need to find that happy medium where the club matches the market. It's different with every club. **GCI**

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STATE OF THE INDUSTRY 2018:

THE GREAT REINVESTMENT

A decade after the Great Recession, smart facilities are pouring millions into capital improvements and reshaping the golf market of the future.

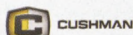
By **Guy Cipriano**



INTEREST
RATES



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TEXTRON GOLF



As this year's State of the Industry report once again shows, the golf industry continues to evolve. As it does, Textron Specialized Vehicles is changing with the times to better serve you.

2017 was a transformative year for us, with E-Z-GO®, Jacobsen®, Cushman® and Textron Fleet Management coming together under one umbrella — Textron Golf. We are uniquely positioned to be a single-source solution for a course's equipment needs, from E-Z-GO golf cars, to Cushman utility and hospitality vehicles, to Jacobsen turf-care equipment. We offer the industry's largest sales and service network to golf facilities worldwide, ready at a moment's notice to help you work more efficiently, reduce your operational costs, and improve the golfer's experience at your course.

2017 also showed Textron Golf's continued commitment to innovation with the launch of several new products across our brands and product lines. Jacobsen introduced its SLF530 superlight fairway mower, providing Jacobsen's unparalleled quality of cut while exerting less ground pressure than a golfer's foot. Our Textron Fleet Management solutions allow course operators to track their equipment fleets, and monitor maintenance crews, golfers' pace of play and other course activities in real time, while providing their golfers an enhanced on-course experience.

And we became the first manufacturer to launch lithium-powered golf cars at fleet scale, introducing our ELiTE™ series of E-Z-GO golf cars. These vehicles are activated by exclusive Samsung SDI zero-maintenance batteries backed by an industry-leading five-year, unlimited amp-hour warranty. This proven technology reduces your electric bills and labor costs — with no compromises to the golf car's performance and daily range.

We are proud to sponsor this year's State of the Industry report and expect that you will find it informative and helpful as you plan for the future. As the industry changes, you can count on Textron Golf to continue to evolve with it, providing a steady drumbeat of new and improved products and services to help you adapt to change, better serve your customers, and grow a larger, more profitable business.

Sincerely,

Michael R. Parkhurst

Vice President, Golf Textron Specialized Vehicles Inc.

We would like to take a moment to wish you all a Happy New Year! As we look back on a successful 2017, all of us at Nufarm are entering 2018 with great enthusiasm. This year is another excellent opportunity to bring you new, innovative products that will deliver better outcomes in the year ahead.

We're thankful for the success of our recent launches, including: Anuew® — a PGR that has quickly become part of the turf quality management puzzle; and Pinpoint — an impressive new Dollar Spot solution. We're also pleased to have many new solutions coming on the horizon.

One new innovation we'll spotlight in early 2018 is a proprietary turf fungicide that combines two FRAC active ingredients in a convenient pre-mix formulation to help golf course managers gain traction in fighting 19 challenging diseases and algal scum. This fungicide is labeled for use on greens, tees, fairways, and aprons and intended to serve as a top-performer in your disease control and resistance management program, improving flexibility and saving you time. We look forward to sharing more with you in the coming days.

As a trusted partner to the golf course industry, Nufarm is committed to innovation that will bring you the tools that you need. We will continue to evolve so that you may continue to evolve, and we look forward to supporting your journey.

Cam Copley

Golf National Accounts Manager

METHODOLOGY

During the fourth quarter of 2017, Golf Course Industry created a State of the Industry survey, administered online via SurveyMonkey, to gauge the overall fiscal condition of the turf maintenance side of the industry, to benchmark capital spending trends and to chart other industry-wide tendencies as they relate to the business of golf course maintenance.

More than 450 superintendents from around the U.S. and Canada completed the survey. As an added incentive to complete the survey, GCI committed to make a substantial donation to the Wee One Foundation, a charity group started in memory of Wayne Otto, CGCS, that helps superintendents and other turf professionals in need.

Lastly, in addition to periodic email reminders to take the survey, GCI provided access to the State of the Industry questionnaire via a concentrated social media campaign that involved not only the GCI website and biweekly newsletter, but also Facebook and Twitter.

For the purpose of this report, when analyzing the data, GCI editors broke down the findings regionally based on the USGA's boundaries, as well as between public and private facilities. When reporting on budgeting trends, to provide a more accurate and comprehensive financial picture, additional interviews were done with both participating survey respondents and industry insiders to provide detailed analysis on trends and observations.

— The editors

Nineteen months after his presentation at Carolina Golf Club in Charlotte, a magazine editor reminded DeLozier of his upbeat projections. He embraced golf when

others flocked elsewhere, yet his humility resonates. "I try to be a realist," he says. "I try to understand that not everything will work to the advantage of golf, but I'm very optimistic for the future of golf."

A soaring stock market, decreasing unemployment and a solid base of committed golfers are producing the highest level of operator confidence since the mid-2000s. Whether you're a management company executive in Scottsdale Ariz., or superintendent in Pinehurst, N.C., a few metrics and emotions are likely working in your favor entering 2018.

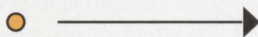
GCI conducted its annual State of the Industry survey of superintendents and partnered in the American Society of Golf Course Architects/Sports & Leisure Research Group Golf Facility Market Trend Watch in late 2017. Both reports indicate substantial funds exists for capital improvements, meaning golf's current cycle

might be remembered as the Great Reinvestment.

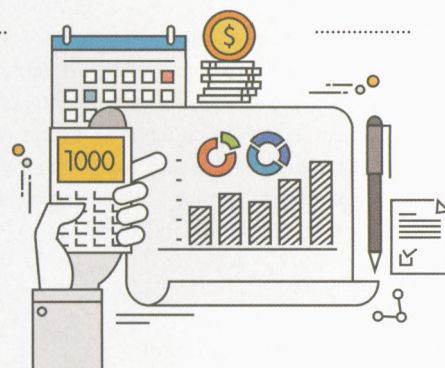
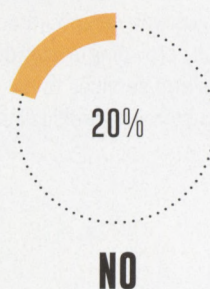
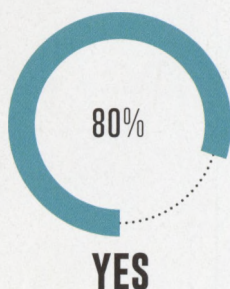
The average maintenance budget is

With remnants of the Great Recession still stalling parts of the golf business, Henry DeLozier exuded calm on April 12, 2016, using his forum as the leadoff speaker at the GCI Technology Conference to describe golf's fortuitous spot.

An audience consisting of course superintendents and industry professionals listened to DeLozier use words such as "bullish," "prosper," and "optimistic," strong language considering the cuts and closings the industry had endured. DeLozier, a principal at Global Golf Advisors, is a golf advocate who passionately celebrates the game's values and career potential. He's also been humbled by golf's tumbles, a combination of uncontrollable global economic factors and self-inflicted follies.



BUDGETING FOR CAPITAL IMPROVEMENTS IN 2018



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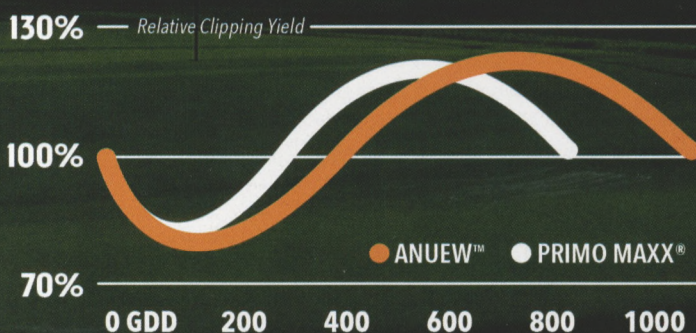
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THE 2018 VIBE



"We feel good. We are cautiously optimistic. The stock market has been very strong and that drives a lot of dollars and a lot of optimism among our customers when corporations spend. It's still very competitive and it all really depends on your local market. For the golf business, we would feel a lot better if we can grow the base of golfers and overall rounds. I think we feel like the economy seems to be moving along at a pretty good clip and people are willing to spend, and they will spend for a really good experience and for good value."

Steve Skinner, CEO KemperSports



"It's still very competitive out there, don't get me wrong. But this is a great time to be doing this work. There's a lot of good contractors and people interested in doing the work. I have to believe 2018 will be every bit as good as 2017."

Bill Kubly, Founder and CEO, Landscapes Unlimited



"We are in a bull market. The stock market is frequently setting records that have never been imagined before. The growing economy is causing everyone to feel more positive and more optimistic, it's causing more membership, more participation. The downside of that is that with the unemployment figure down, it's harder to find labor and, therefore, you have to pay them more. We're seeing both sides of that."

Henry DeLozier, Principal, Global Golf Advisors

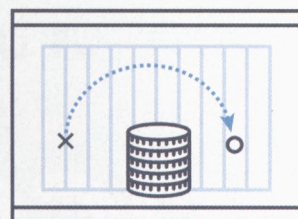


"I think it's prosperous times. But they are going to be sustainable in the sense that they will be golf-centric instead of real estate-centric development. In the 'boom' time so many of the golf courses were built to drive real estate and then we know what happens to the real estate. It's very cyclical. It's up and down. Then, when you tie a golf course to that, the golf course isn't just sustainable from a membership perspective."

Bob Farren, Director of Golf Course and Grounds Management, Pinehurst Resort

storming toward \$1 million. Thirty-three percent of the more than 450 superintendents who responded to the GCI survey reported non-capital operations budgets exceeding \$1 million, bringing the average maintenance budget to \$911,705, the highest average since GCI started tracking superintendent data in 2012. Increased labor costs are a major reason for the spike. Labor accounts for 60 percent of a facility's maintenance budget, according to the survey. But operators' willingness to provide the necessary resources to produce splendid course conditions are also contributing to larger ledgers.

"We are putting money back into the golf course, and it's not just labor and things that aren't controlled by us," Troon senior vice president of science and agronomy Jeff Spangler says. "We are also increasing maintenance budgets, changing our fertilizing practices a little



PROJECTED 2018 CAPITAL IMPROVEMENT BUDGET

\$313,042



PROJECTED 2012 CAPITAL IMPROVEMENT BUDGET

\$160,724

HOW DIFFICULT WAS IT TO GET THE BUDGET TO DO YOUR 2018 CAPITAL IMPROVEMENT PROJECTS AND PURCHASING?



**10%
EASIER
THAN I HAD
ANTICIPATED**



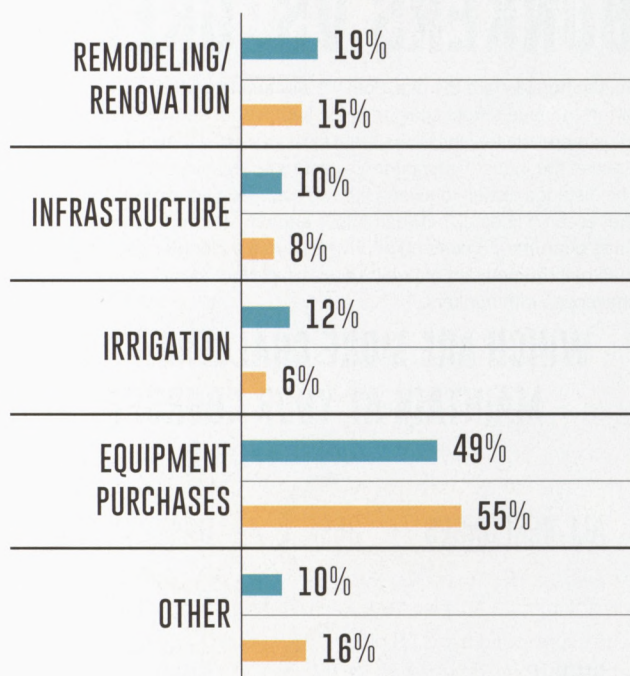
**69%
ABOUT
WHAT I
ANTICIPATED**



**21%
MORE
DIFFICULT
THAN I HAD
ANTICIPATED**

► BREAKDOWN: CAPITAL SPENDING

2018 2012

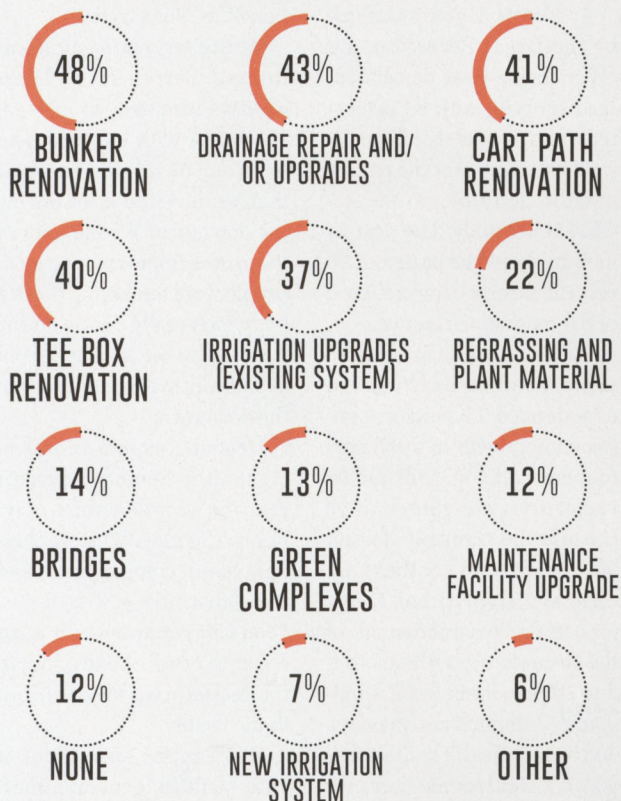


bit by getting more aggressive again and providing a little more preventative maintenance on chemical programs. There's greater stability and we are putting money back into the golf course. Maintenance budgets for us have increased every year for a while now, including on

all the individual line items in our budget."

Spangler works for the industry's largest management company. Troon manages around 270 facilities and its portfolio includes courses in all four major categories: private, public, municipal and resort.

CAPITAL IMPROVEMENT PROJECTS SLATED FOR THE NEXT THREE YEARS

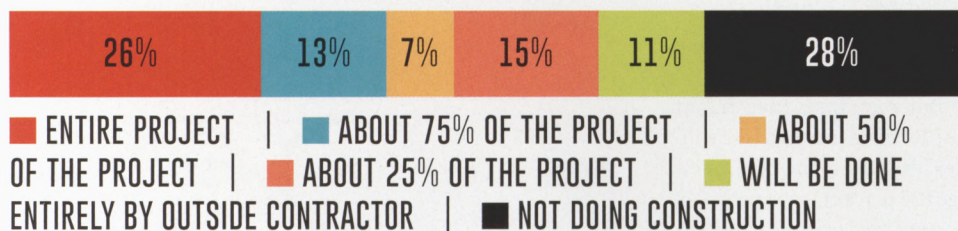


EDITOR'S NOTE: "OTHER" INCLUDED: FULL COURSE RENOVATION, DRIVING RANGE, TREE TRIMMING, POOL AND POOL HOUSE, SHORTER TEES, BUNKER REMOVAL AND/OR MODIFICATIONS.

Each category faces distinct challenges – municipal courses must cope with bureaucratic intervention while private clubs

joust for younger members – but Spangler says, in general, the industry "has rounded the corner to some degree."

IF YOU ARE DOING CONSTRUCTION, HOW MUCH OF THE WORK WILL BE DONE IN-HOUSE?



CLIMBING DOLLARS FOR CAPITAL

The volume and scope of capital improvements represents the biggest swing at many facilities. The average capital improvement budget for 2018 is \$313,042, a nearly 100 percent jump from an average of \$160,724 in 2012, according to the GCI survey. Stagnant facilities are anomalies, as 80 percent of superintendents report they are budgeting for

capital improvements. "I think 2018 is going to be a great year for golf course architects and builders," DeLozier says.

Architects, a group battered by the Great Recession, are experiencing more demand for their services, with 83 percent reporting increased or flat renovation revenue over the past 24 months, according to the AS-GCA-SLRG study. The next 24 months should be busier, as 90 percent are expecting increased or flat renovation revenue.

Builders are also in a growth mode. Landscapes Unlimited experienced 15 percent construction growth in 2017, says founder and CEO Bill Kubly. Projections are conservative because the company doesn't book work until contracts are officially signed, but Kubly expects the construction side of the business to grow by another 5 to 10 percent in 2018. Landscapes Unlimited also manages and owns courses. The company added a contract maintenance division in 2017. "I couldn't be more positive right now," Kubly says.

Competitive desires spur enhancements among the top 25 percent of clubs, DeLozier says, thus the current rise of \$1 million or more renovations, especially in the Southeast, where the average projected 2018 capital improvement budget is \$579,159. Examples of courses executing bold projects during the Great Recession proved rare. Pinehurst Resort restored its No. 2 famed course and improved its clubhouse in the middle of the Great Recession, business decisions director of golf course and grounds management Bob Farren says benefitted the resort when the economy started improving. Pinehurst recently embarked

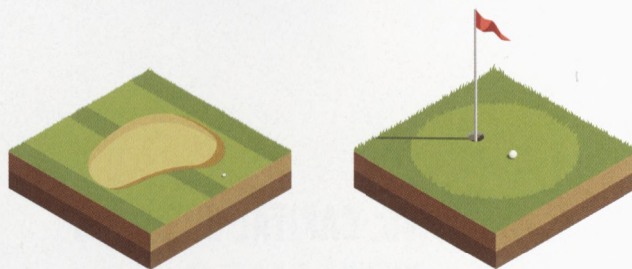
on another phase of major capital improvements, which includes the opening of a nine-hole short course and renovation of its No. 4 course.

"We're very optimistic about things," Farren says. "What we have been able to take advantage of with our resources from our ownership family is that we invested a lot during the downturn. We did a lot of those investments when a lot of people were hunkering down a lot, which really put us on the front end as we have come out of and continue to come out of the downturn."

Delaying capital improvements is a common operator reaction to a downturn, says KemperSports CEO Steve Skinner, whose company manages more than 130 golf facilities. "You can get away with it for a year or two," he adds, "but in the long term you need to invest in the facility."

While major renovations at elite facilities generate buzz, courses pursuing deferred capital projects or purchases are major contributors to the golf economy. Nearly half of all facilities (48 percent) are planning bunker renovations in the next three years, according to the GCI survey. That follows multiple years of steady bunker improvements. "There's pent-up demand from the really higher-end clubs that started doing bunker work three, four years ago," Kubly says. "Now it's the maybe middle market golf courses saying, 'We need that too.' It's keeping up with the Joneses – and the economy is strong."

But the Great Investment also involves hundreds of facilities planning to upgrade drainage (43 percent), cart paths (41 percent) and existing irrigation

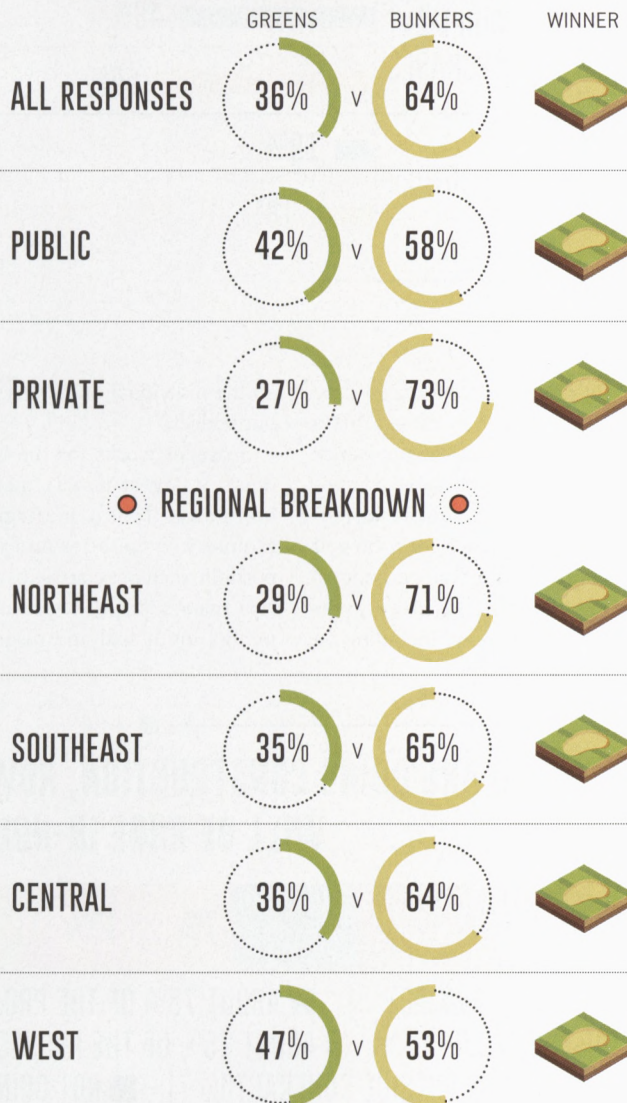


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BUNKERS VS. GREENS

So, the bunkers are the pits, both literally and figuratively. The majority of turf managers from coast to coast find the bunkers on their course to be more challenging to maintain than greens, with two-thirds of State of the Industry respondents casting a negative strike on bunkers. The distance disdain between the two increases as you break out the research findings between public and private courses, with nearly three-quarters (73 percent) of private course superintendents and more than half (58 percent) of public course superintendents facing more challenges with bunkers.

WHICH ARE MORE CHALLENGING TO MAINTAIN AT YOUR COURSE?





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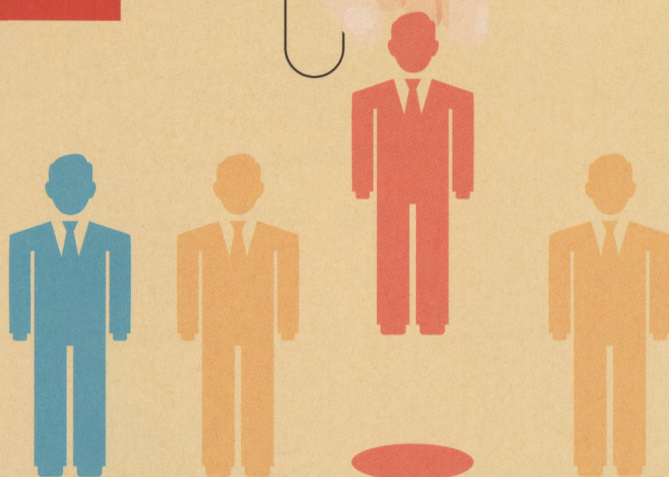
HAULER 1200

HAULER 1200X

HAULER PRO

HAULER PRO-X





THE GREAT SHORTAGE

Golf's labor situation failed to improve in 2017, and industry executives and analysts are predicting more struggles filling open positions in 2018.

Among the reasons for the continued shortage:

Dipping unemployment. The national unemployment rate dropped to 4.1 percent in 2017. By comparison, the rate was 10 percent at the end of 2009. "I have been around long enough to see a couple of the waves, but especially on the golf course maintenance side the labor market is getting tighter," KemperSports CEO Steve Skinner says.

Immigration confusion. The number of available workers in the H-2B program didn't increase to 81,000 until late July, which Landscapes Unlimited founder and CEO Bill Kubly says, "doesn't do golf people a lot of good." The H-2B program provides short-term visas for workers in nonagricultural positions. Uncertainty over the status of illegal aliens entering 2018 adds further uncertainty. Landscapes Unlimited has aggressively developed a pool of Puerto Rican labor to fill construction, maintenance and even office positions, but dozens of unfilled positions exist in key golf states such as California and Texas. "I can use another 100 employees and that's just on the construction side of our business," Kubly says. "We don't have as much trouble finding employees for managing golf courses as we do for construction and maintenance workers on the golf courses. That's the main shortage because we are prohibited from hiring illegal aliens."



Wage wars. Hourly wages are going to "increase decidedly" in 2018 for operators, says Global Golf Advisors principal Henry DeLozier. "I think labor costs are going up 6 to 7 percent in the golf business – and that's if you can get workers," he adds. Offering higher starting wages to attract employees will have a dramatic effect on departmental budgets because veteran employees will expect to make more than new hires. Ascending minimum wages in multiple states will also impact budgets. "What you and I grew up thinking about minimum wage is no longer," DeLozier says. "To get people to work for the kinds of jobs that we have in golf, they're expecting to make substantially more than minimum wage."

Perhaps no group will absorb the shortage more than golf course superintendents, who DeLozier says will face pressure to "find new solutions to achieve the same standards of excellent with less labor." Labor will account for 60 percent of the average maintenance budget in 2018, according to GCI's State of the Industry survey. The average course will support a 16-person maintenance crew with eight full-time year-round employees.

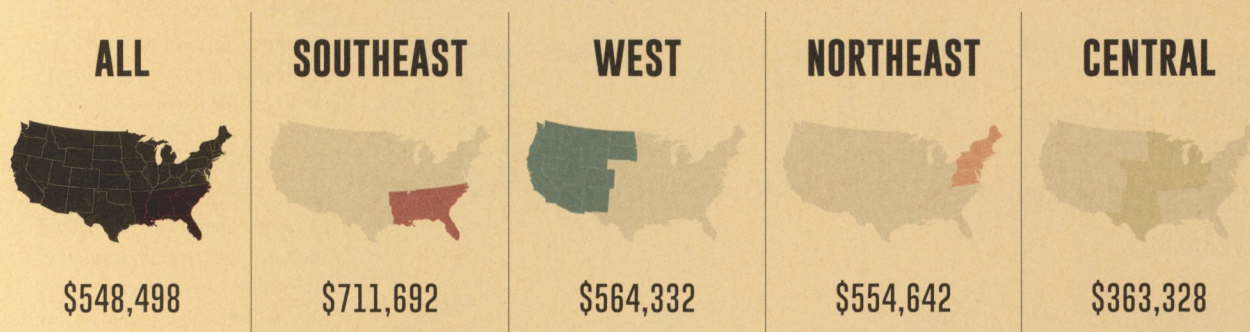
Wider mowers, plant growth regulators, fitting turfgrass varieties to geographic regions (translation: less bentgrass in the South), installing modern bunker liners, bunker reduction, hiring more part-time and fewer full-time crew members, transforming maintained turf into native areas, and morning and afternoon maintenance shifts are among the current labor solutions cited by superintendents and management company executives.

Robotics are one potential solution that will likely not fill shortages in 2018. Industry companies are taking a methodical approach with robotics as labor remains cheaper than the implementing the technology in most local markets.

"Robotics are definitely something we have been paying attention to for a while," Textron Golf director of product development Matt Zaremba says. "There's a lot of complexity with it to be completely honest about it. You won't see anything commercially from us until the whole technology is vetted and we're very comfortable with it as an organization."

"To draw a parallel, we just launched our lithium golf cars (in 2017). Our first exploration with lithium golf cars was over a decade ago. We had a limited number of cars out in the field once we got comfortable with the technology for about five years. That gives you an idea on the long-term perspective we take on new technologies, including robotics."

PROJECTED 2018 LABOR COST



PERCENT OF OPERATIONAL BUDGET ALLOCATED TO LABOR COSTS AND RELATED OVERHEAD

2018 BREAKDOWN	2018			2012		
	ALL	PUBLIC	PRIVATE	ALL	PUBLIC	PRIVATE
LESS THAN 30%	3%	4%	2%	5%	6%	5%
30% TO 39%	19%	25%	9%	9%	11%	9%
40% TO 49%	31%	38%	21%	19%	24%	12%
50% TO 59%	0	0	0	37%	37%	38%
60% TO 79%	46%	32%	68%	29%	21%	36%
80% OR MORE	1%	1%	1%	1%	1%	0

HOW DOES THE SIZE OF YOUR LABOR FORCE COMPARE TO THREE YEARS AGO?

	ALL RESPONSES		
	ALL	PUBLIC	PRIVATE
SIGNIFICANTLY MORE	3%	2%	3%
FEW MORE	16%	13%	21%
FEW LESS	32%	33%	31%
SIGNIFICANTLY LESS	6%	7%	6%
SAME	43%	45%	39%

2018 BREAKDOWN	SOUTHEAST			WEST			NORTHEAST			CENTRAL		
	ALL	PUBLIC	PRIVATE	ALL	PUBLIC	PRIVATE	ALL	PUBLIC	PRIVATE	ALL	PUBLIC	PRIVATE
LESS THAN 30%	6%	7%	6%	4%	6%	0	1%	3%	0%	3%	3%	2%
30% TO 39%	30%	47%	13%	15%	21%	0	20%	32%	8%	16%	20%	12%
40% TO 49%	21%	20%	25%	31%	33%	22%	19%	29%	8%	41%	51%	27%
50% TO 59%	0	0	0	0	0	0	0	0	0	0	0	0
60% TO 79%	43%	26%	56%	49%	39%	78%	59%	33%	84%	39%	24%	57%
80% OR MORE	0	0	0	0	0	0	1%	3%	0	1%	2%	0

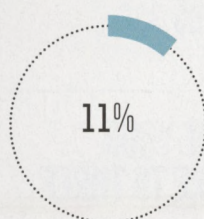


MAINTENANCE BUDGET

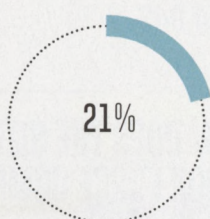
PROJECTED 2018
NON-CAPITAL OPERATIONS
(MAINTENANCE) BUDGET,
INCLUDING WATER, LABOR,
AND OVERHEAD

\$911,705

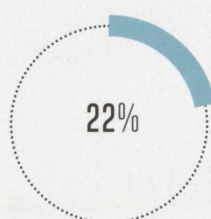
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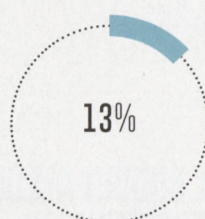
< \$250,000



\$250,000 - \$499,999



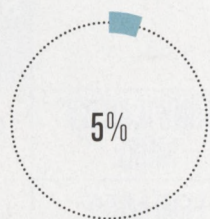
\$500,000 - \$749,999



\$750,000 - \$999,999



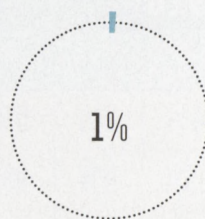
\$1M - 1.9M



\$2M - 2.9M



\$3M - 3.9M



MORE THAN \$4M

systems (37 percent) within the next three years. Even 12 percent of courses are expected to improve their maintenance facilities, operational support structures seldom seen by customers.

And let's not forget equipment. Nearly half (49 percent) of capital spending in 2018 will include equipment purchases, so fresher coats of green, orange and red will be spotted in all four regions. "The message I hear is that people are getting comfortable with the new stability in the industry," Textron Golf director of product development and strategy Matt Zaremba says. "Once things get stable, you can feel more confident with what tomorrow will look like and courses are willing to invest and improve and contribute more to their business when conditions are stable."

BETTER COURSES, BETTER MORALE

Bunkers with improved drainage and sleeker equipment should boost another group rattled by the Great Recession: superintendents and their teams. A decade of tightening budgets and deferred projects convinced hundreds, if not thousands, of highly trained professionals to abandon the industry.

Those who stuck around are now witnessing unfamiliar sights such as the delivery of new sand, equipment and chemistries. The deliveries are tangible signs of the Great Reinvestment. "Who doesn't like that new car smell?" Farren says.

REGION	AVERAGE MAINTENANCE BUDGET	PUBLIC	PRIVATE
NORTHEAST	\$928,842	\$614,035	\$1,279,627
SOUTHEAST	\$1,304,204	\$858,862	\$1,611,702
CENTRAL	\$716,128	\$474,764	\$1,006,927
WEST	\$1,060,379	\$905,448	\$1,566,486



AVERAGE NON-CAPITAL
OPERATIONS BUDGET
SINCE 2012

2018	2017	2016	2015	2014	2013	2012
\$911,705	\$798,200	\$750,000	\$697,000	\$651,392	\$651,392	\$622,500



RICK FLETCHER
*Technical Services Manager,
Nufarm Americas*

"WE'VE COMBINED TWO MODES
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Increased facility spending might mean more scenes like the one at last year's Carolinas GCSA Conference & Show. Instead of struggling to fill available booths, the association scoured the Myrtle Beach Convention Center for additional room, using a portion of the lunch area to satisfy the 217 companies who occupied 407 booth spaces. Both totals are the highest since 2008. Carolinas GCSA executive director Tim Kreger attributes the current renovation frenzy to the show's 2017 growth. Besides more commerce, Kreger has observed improved morale.

"We feel like our members have felt the brunt of a lot of cuts over the last couple of years and have suffered hardships where they have lost jobs or taken pay cuts to stay employed," he says. "Anything we can do to see some positive energy come back around, whether that's personal growth and improvement or health care improvement or to hire some folks to help so they are not working so hard, are all positives."

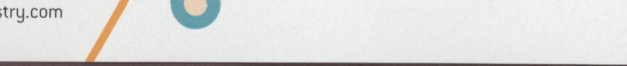
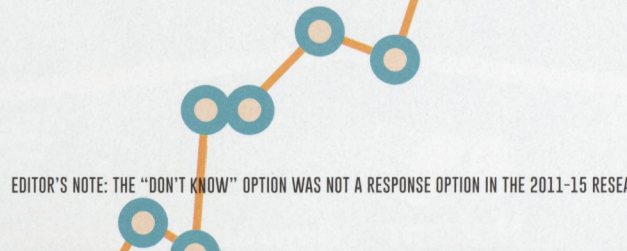
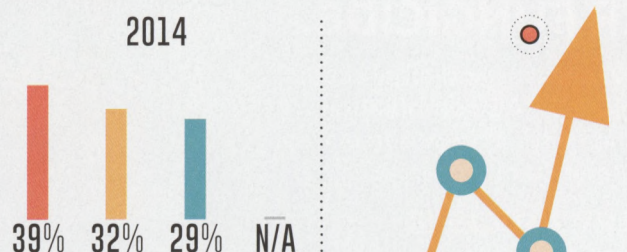
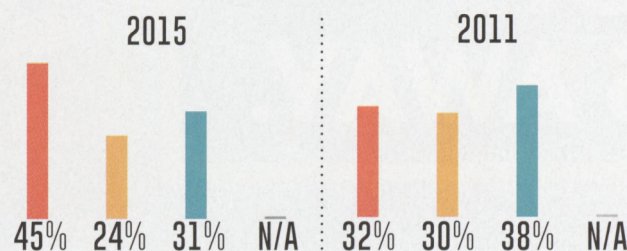
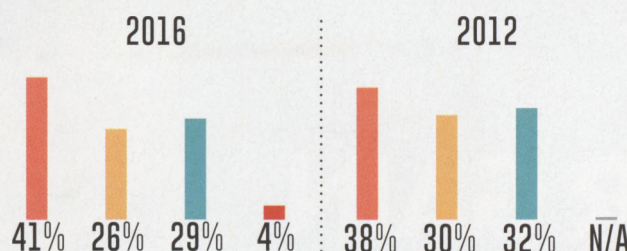
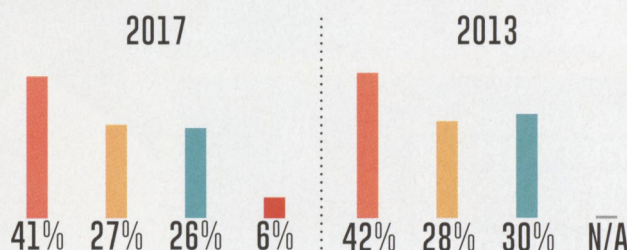
As signs point toward the positive energy continuing in 2018, a loaded question emerges: Is the golf industry back?

The number of golfers has decreased from 30 million in 2006 to 23.8 million in 2016, according to National Golf Foundation data. But DeLozier says the industry can grow without expanding its customer base because mobile jobs that can be performed anywhere, including on a golf course, shrink the separation between work and recreation. Expanded and creative programming are other ways to increase revenue without expanding the base of golfers, Skinner says.

CONTINUED ON PAGE 70

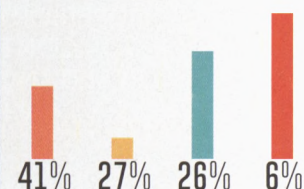
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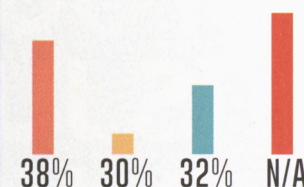


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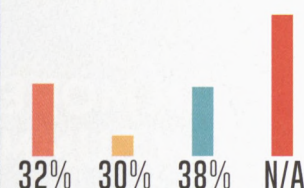
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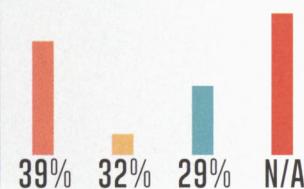
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Henry DeLozier is a principal in the Global Golf Advisors consultancy. DeLozier joined Global Golf Advisors in 2008 after nine years as the vice president of golf for Pulte Homes. He is a past president of the National Golf Course Owners Association's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

Happiness is a butterfly, which when pursued, is always just beyond your grasp, but which, if you will sit down quietly, may alight upon you.

– Nathaniel Hawthorne

Happiness, like a butterfly, can be elusive for golf course owners and operators challenged by the shifting tides of economics, demographics and lifestyles. But a new program from Audubon International, where I am honored to serve as chairman of the board of directors, promises some happier days for those with the patience to await the butterflies.

Over the past 20 years, populations of the iconic monarch butterfly have declined by 90 percent. A key reason for the decline is a lack of habitat, especially a lack of milkweed. As it turns out, golf courses represent a wonderful opportunity to plant milkweed and other wildflowers that provide sustenance and habitat for monarchs.

Marcus Gray, the director of Audubon's Cooperative Sanctuary Program for golf, says: "Golf courses have been identified as having great potential for the development of monarch habitat. We estimate that there are at least 100,000 acres of available space on golf courses to help butterflies."

No one is arguing that monarchs are the answer to golf's challenges.

But helping to save the king of the butterflies will have tangible benefits. When courses create monarch habitat in out-of-play areas, they increase the beauty of their course. They also make a statement about their commitment to sustainability. According to a 2017 survey by Pew Research, 75 percent of Americans are concerned about the environment and 1-in-5 acts on their concern. A separate Pew study found that women – by 17 percent more than men – are acutely concerned about the environment.

Millennials put their money behind environmentally concerned companies. According to Nielsen global research, nearly three-fourths of millennials support companies committed to positive social and environmental actions and programming.

"Brands that establish a reputation for environmental stewardship among today's youngest consumers have an opportunity to not only grow market share, but build loyalty among the power-spending millennials of tomorrow, too," says Grace Farraj, who leads Public Development & Sustainability at Nielsen.

Any courses out there not inter-

ested in appealing to women and millennials?

Audubon is making it easy to do well by doing good. Its "Monarchs in The Rough" program guides land managers through pesticide reduction, site preparation, planting and long-term maintenance of habitat for pollinators. "Our goal is to create at least one acre of new vegetation installed specifically to bolster monarch numbers on every golf course," Audubon International CEO Christine Kane says. "Many courses have existing gardens and larger plots dedicated to wildlife already."

The program is open to any golf course in Canada, Mexico or the United States. Superintendents can plan, install and manage monarch habitat on their courses by following guidelines published by Audubon. The program provides superintendents and staff with the information and technical support they need to incorporate monarch habitat into the unique layout of each course. Guidelines include how to plant and establish milkweed and other nectar-producing plants; track progress and manage the habitat; and procure native and ecologically appropriate plant materials, such as milkweed seed. In addition, superintendents can connect with the Audubon network of participating courses and communicate with their customers about the plight of the monarch and how they can help.

Monarchs in The Rough has the potential to provide up to 20 million milkweed plants toward a goal of 1 billion to 1.5 billion stems of milkweed available for monarchs. This amount of plants is what is required to maintain a robust population of butterflies at overwintering sites in Mexico.

Unfortunately, monarchs won't add to membership rolls or fill tee sheets. But for the small effort required to save one of nature's greatest wonders, they will certainly bring no small measure of beauty and appreciation. Happiness is, indeed, a butterfly. **GCI**

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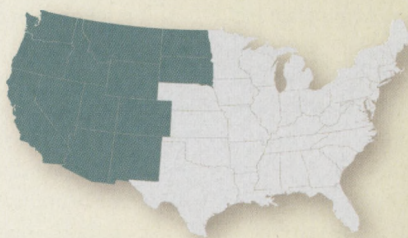
Be on the **lookout**

Get the scoop on the top regional pest and disease problems to look out for this spring.

By **Rick Woelfel**



Pests and disease decimate golf courses and can wreak havoc on a season before it even gets started. Superintendents appreciate the importance of planning and being alert to potential problems before they become season-ending catastrophes. We asked the experts about the potential pest pitfalls turf managers may face in their respective regions this year and what to keep an eye out for before it becomes a major problem.



west

Patrick Gross is based in Santa Ana, Calif., where he serves as the West Regional Director for the USGA Greens Section. Gross notes there is no single particularly troublesome disease or pest in the West. He attributes this agronomic status quo to the professionalism of the superintendents he works with day in and day out. "There's not one biggie wiping everybody out [in the region]," he says. "Superintendents are on top of their game."

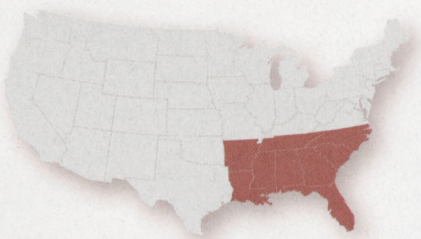
Many superintendents maintaining turf in the West will be watching for rapid blight, a disease that was first identified in California in 1995, Gross says. This pathogen affects cool-season grasses and tends to thrive in soil with elevated salt content or areas irrigated with saline water. Most concerned are superintendents managing *Poa annua* greens, but rapid blight can also impact bentgrass putting surfaces. Its impact is devastating to turf. Rapid blight can kill infected turf in as little as two or three days. "It comes on so suddenly," Gross says. "And it can cause a lot of damage."

Gross recommends attacking rapid blight with a combination of Mancozeb fungicides and Insignia. A big key toward warding off rapid blight is managing soil salinity. "(Rapid blight) is very tightly related to elevated salinity in the soil," he says. "No. 1, you've got to lower the salinity."

Winter rains, or the lack of them, has a significant impact on soil's salinity level. "Last year (the winter of 2017) we had decent winter rainfall that really leached the salt out of the soil," Gross says. "But previous to that we weren't getting winter rainfall and that salinity accumulates. Guys think that because it's cool outside that they don't have to worry about the salinity, but you should constantly monitor the salinity with a hand-held meter. So that's important, along with leaching or heavy applications of water to drench the soil and lower the salinity."



Rapid blight is a disease to watch in the West this year.



southeast

By now, the golf season in Florida and the rest of the Southeast has kicked into high gear. At the same time, Dr. Adam Dale has focused his attention on the Bermudagrass mite. "I got the most calls about this pest at the beginning of 2017 and probably 2016 also," says Dale, a University of Florida assistant professor of entomology and nematology.

The Bermudagrass mite is an eriophyid mite, meaning it feasts on a single strain of turf. In this case, it sets its tastes on Bermudagrass. As is the case with other eriophyid mites, it is extremely small and extremely difficult to detect, even with a high-quality hand lens. The pest typically makes its appearance in the spring,

Dales says, and is found across the Southeast, where Bermudagrass prevails.

"It is pretty widely distributed throughout the Southeastern U.S., but seems to be most problematic in Florida, Georgia, and parts of South Carolina," he says. "But they find it over in Texas, also."

The pest creates what Dale describes as a "witch's broom" effect. "Imagine a chute of Bermudagrass that looks like a broom," he says. "It's got a long chute and all the foliage is tightly grown in a big tight wad at the tip of that chute."

The presence of the Bermudagrass mite results in thin strands of turf that are, in Dale's words, "really clumpy looking." The net result is an uneven playing surface.

The pest is most commonly found on Bermuda fairways, particularly in low-cut areas. It is also found on tees and greens. To control and manage Bermudagrass mites, Dale recommends a lower mowing height than normal. "We did a trial where we had some Bermudagrass that was mowed at about an inch," he says. "We came in and mowed it to about a quarter-of-an-inch and collected all those clippings that we cut up and removed them from the system."

"What we saw was that just from mowing really low and collect-

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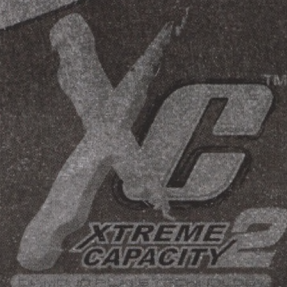
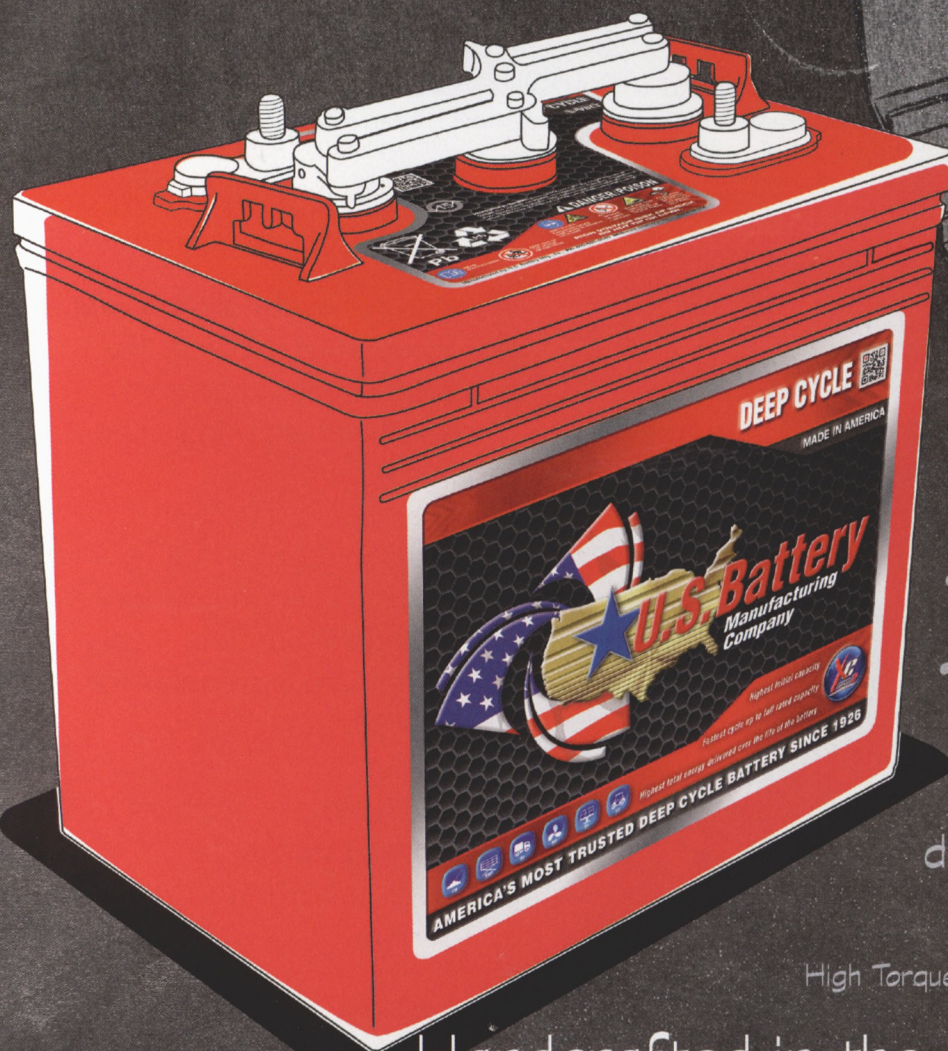


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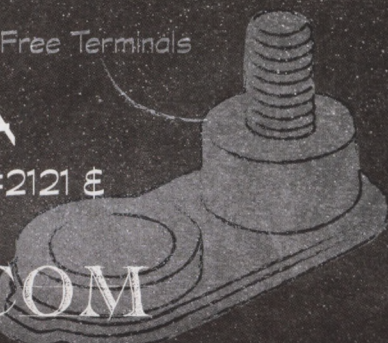
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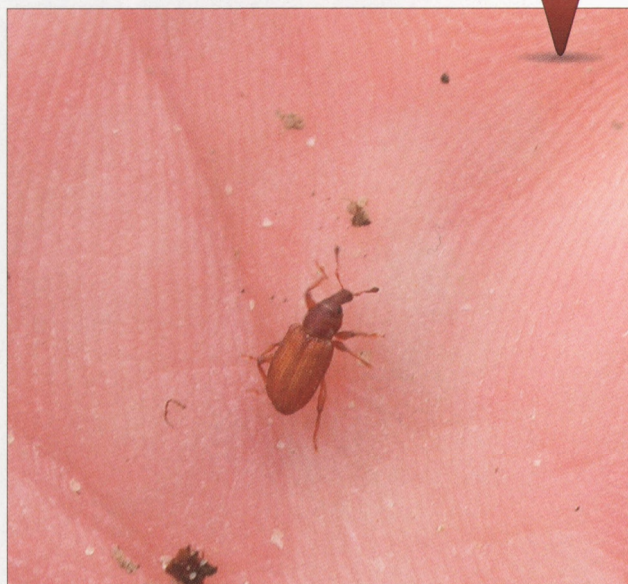
ing all the clippings we reduced the damage and the abundance of the mites by about 50 percent for the rest of year.”

The nematicide Divanem has been effective in combating the Bermudagrass mite, Dale says, adding the label has recently been updated for use against Bermudagrass mites on golf courses. Dale and his team made two applications of Divanem at a 14-day interval. The most effective application rate proved to be .14 oz/1,000 square feet



northeast

For superintendents based in the Northeast, the annual bluegrass weevil (ABW) is always a concern. While the pest has been migrat-



The annual bluegrass weevil is a pest to watch in the Northeast this year.

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ing westward and southward in recent years, it is most common in the Mid-Atlantic and Northeast sections of the country, as well as in Canada. It was first identified in Connecticut in the early 1930s.

Some turf experts, among them Dr. Albrecht Koppenhofer at Rutgers University and Dr. Ben McGraw at Penn State, have theorized there is a strain of ABW that thrives in a golf course environment.

Jim Skorulski, a USGA agronomist based in Palmer, Mass., advocates an integrated approach in dealing with ABW that encourages establishment and growth of bentgrass, which is a less effective host. He also recommends properly timed insecticide applications – monitoring ABW activity via WeevilTrak – for maximum control of both adults and larva. This is coupled with rotating products from different insecticide groups, or those with different modes of action, to prevent or slow the onset of resistance.

With ABW, resistance issues have become more problematic in the case of ABW. “Resistance to the insecticides has been a

“The ABW is most common in the Mid-Atlantic and Northeast.”

major concern that has impacted management programs,” Skorulski says. “Researchers have demonstrated cross resistance, where the annual bluegrass weevil becomes resistant to one chemistry and is able to detoxify other chemistries, as well. Golf courses with reported resistance rely on newer chemistries that more aggressively target the larval stages of the insect.”

Skorulski notes that Ference, a Syngenta product, and Conserve, which is produced by Dow, are two of the newer products that have become popular in ABW management programs. However, in some circumstances, superintendents might benefit from tolerating some insect activity, he says.

“Control expectations can be very high, and it might not be such a bad thing to tolerate a small amount of feeding injury of annual bluegrass at least on tees and lesser-played fairway areas,” he says. “The amount of damage that can be tolerated is based on many factors and would vary from golf course to golf course. Maybe it is time to selectively reduce some of the inputs that protect annual bluegrass in favor of more durable bentgrass.”

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central

Come spring, turf pros in the Central region will be on the lookout for dollar spot. However, “cleaning up” in the fall can reduce the likelihood of a major spring outbreak, says Dr. Paul Koch, an assistant professor of plant pathology at the University of Wisconsin. “If you go into the winter with disease, you’re more likely to have disease the following spring,” he says. “Failing to clean up areas of dollar spot or whatever it might be is going to make you more susceptible to disease the following year.”

“If you cleaned up pretty well the previous year and had healthy turf growing into the snow cover, then you’ll start off the next year disease free; that puts you in a more advantageous spot. Once you get behind once there is already a disease present, it takes more effort, it takes more fungicide, it takes more money to get it under control.”

Koch has been seeing major fall outbreaks of dollar spot in recent years. Controlling the problem before snow arrives is a major challenge. “We’re seeing more and more dollar spot occur in the fall,” he says. “I don’t know why that is. There might be different genetic strains that occur in the fall than those that occur in the summer, (but) in most years we have a fairly big fall dollar spot outbreak. If we don’t clean that up before winter comes along, sometimes it’s just too late in the fall (to prevent problems in the spring). We’ve had dollar spot outbreaks in November in the past. That’s tough to clean up prior to snow cover.”

The weather also has a “trigger effect” on dollar spot that remains from the fall. Koch recalls the spring of 2012 when March temperatures in Wisconsin rose to record levels and remained there for a full week. “We didn’t see any dollar spot then,” he says. “But when it did occur in May, it was much more aggressive than it would have

been in a typical year. It kind of exploded on you. Whereas, in a normal year it would be a spot here, a spot over there, it would slowly build up. That year – I think it was May of 2012 – it was very aggressive. It

came on very quickly.”

What is likely happening is the dollar spot fungus is getting inside the plant well before turf managers see symptoms, Koch says. “It kind of hangs out there for a while

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and then there is some sort of trigger that causes symptoms to develop.”

Koch recommends combining iron sulfate with conventional fungicide applications to enhanced dollar spot control. “Iron sulfate without any fungicides, is not likely to give very effective dollar spot control,” he says, “but what it does do is when you combine it with your normal fungicide program, it helps to knock down the fungal population and makes it easier to control.” **GCI**

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



Dollar spot is a disease to watch in the Central region this year.

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Seven Poa MYTHS

Whether you consider it a friend or foe, we set the record straight by addressing some of the plant's most popular misconceptions.

By **Rick Woelfel**

POA ANNUA.

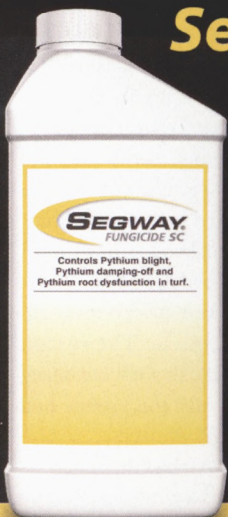
Turf professionals have varying reactions to it. Some manage it the same way they would any other turfgrass species. Others regard it as a nuisance weed, as a pest to be eradicated without prejudice.

When one considers how prevalent *Poa* is and how varied the climate is across North America, it is not surprising that opinions vary about the plant itself. Those opinions are, on occasion, accompanied by misconceptions. We outline a few of the more prevalent ones and attempt to set the record straight.

POA MANAGEMENT PRACTICES ARE UNIVERSAL REGARDLESS OF THE LOCALE OR CLIMATE.

Poa annua is found from the Arctic Circle to the equator, says Dr. Zac Reicher, a specialist with the Bayer Greens Solutions Team. "It is more than capable of surviving in a wide variety of climates," he says. "This is largely due to the tremendous genetic variability of the turf species and its plasticity, or the ability to adapt to its surroundings and cultural management practices. Depending on the climate, *Poa* may be the best-adapted grass, poorly adapted, or anywhere in between. Furthermore, it may thrive in the summer in some areas, spring/fall in other areas, or all-year-long. Plus, every golf course has a different environment of soil types, shade and humidity. Add to this that all courses have a different

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level of 'acceptable' *Poa* population and/or performance, and one quickly realizes that *Poa* management programs vary dramatically from course to course and region to region."

2 I REALLY DON'T HAVE THAT MUCH *POA*, DO I?

Some turf managers, particularly those trying to eradicate *Poa annua* from their golf courses, are surprised



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to learn just how much of it they are dealing with. Jay Young, a PBI-Gordon product manager, has worked in the turf industry for two decades. "I've seen people who are trying to control *Poa*, or manage it, and they don't really have a true sense of how much *Poa* they really have," he says. "They become quite shocked at finding out how much *Poa* they actually have. Some of the void being left by the dead *Poa* is pretty unsightly and pretty large, so whereas they may have thought they may have only had 10 or 15 percent *Poa*, they're finding out they had 20-30-40 percent, leaving some pretty unsightly voids in the turfgrass. Understanding exactly how extensive your *Poa* problem is a major key to really trying to get a grasp on and manage the problem." It's important that superintendents not develop a false sense of security when it comes to managing *Poa*, Young says. "People may tend to let their guard down a little bit," he says. "Next thing you know, it's a major problem because of the fact it is such a prolific seed producer."

3 BENTGRASS IS ALWAYS PREFERABLE TO *POA*.

Lehigh Country Club in Bethlehem, Pa, boasts one of the finest golf courses in the state, a William Flynn-Howard Toomey design. Director of grounds John Chassard has spent nearly four decades in the turf industry, 35 of them at Lehigh. In 1992, he regrassed his greens, replacing the *Poa* surfaces with bentgrass. But the *Poa* returned and Chassard is fine with that. "I'm probably a better *Poa* farmer than I am a bentgrass farmer," he says. "A lot of it is dictated by the microenvironments on your golf course. The reason we regrassed was because we were doing a bunker restoration and the greens had shrunk somewhat. We wanted to recapture the original size. We had great greens going into that. It takes a while, especially in this climate, to really let bentgrass

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grow in. You need a good 12 months of growing, which is essentially a season-and-a-half, almost two seasons of growth."

Today, Chassard and his team tend to greens that contain varying amounts of *Poa*. "I have a few greens that have great exposure," he says. "They're out in the open and they probably still have about 60 or 70 percent bent but then I've got greens that are low lying or in the shade. They go into winter early, they come out of winter late; they stay wetter because of where they're at and they're 100 percent *Poa annua*."

"And I got a lot of com-

plaints because they weren't what they were before we gassed them."

Chassard notes that *Poa* will thrive in areas where other species of turfgrass will not. "The biggest thing with *Poa* – it's going to come in and it's going to thrive in areas where you can't grow anything else, like bentgrass," he says. "If you have good exposure, good air movement, great internal drainage, bent is going to do just fine, and it's a good grass. But on old soil-based push-up greens with no internal drainage, poor air movement and lack of sunlight, *Poa* is going to thrive."



IT'S POSSIBLE TO COMPLETELY ERADICATE *POA ANNUA* FROM A COOL-SEASON GOLF COURSE.

This goal is unrealistic, says Reicher. *Poa annua* is a prolific seed producer, producing upward of 350 seeds per plant per year. Seeds remain viable for up to 16 years in the soil, so there may be up to 110 viable seeds in the soil. *Poa* occupies almost every niche on a golf course, but superintendents are usually limited to only focusing control methods on greens, leaving the rest of the course as a potential "*Poa* nursery." "Bottom line is that it is impossible to eradicate *Poa*

from a cool-season golf course, but you can prioritize your areas and maintain it at a level reasonable for your course, geography and budget," he says. There are a number of quality products on the market to control *Poa*, including Velocity, Prograss and a number of plant growth regulators. But Reicher is quick to point out that chemistry has its limits. "Even an unimaginable 99 percent control in a given area would still allow many plants to continue reproducing," he says.



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is considered an intrusive weed, superintendents trying to eradicate it understandably focus their attention on their greens. But Young cautions not to ignore tees, fairways and rough areas. "There is such an emphasis on managing *Poa* in greens that the rest of the golf course can get forgotten at times," he says. "To have a very effective *Poa* management program you've got to manage the entire golf course, not just the greens and tees. *Poa* can be very easily tracked in from the fairways and the rough surrounding the greens."

BONUS!**POA RESULTS IN BUMPY PUTTING SURFACES**

During televised golf events, if a player misses a short putt, it's not uncommon for a commentator to remark that "the *Poa* growing late in the day has made it tough out here."

But that's necessarily the case, says Jay Young, a PBI-Gordon product manager.

"The greens are so regulated during tournament time and they're under so much stress," he says. They just don't grow during tournament time.

"I've been part of tournament golf in my prior life and during the entire week you could take all the grass you took off all 18 greens and all the practice greens and you probably couldn't fill up an 8-ounce cup," Young adds. "I struggle with that at times, when they say that *Poa* greens get bumpy in the afternoon because the seedheads are starting to grow. On a regular daily-fee course with daily play, that may hold some merit, but during pro tournaments, I kind of struggle with that."



**YOU CAN'T MAINTAIN
POA IN HOT, HUMID
WEATHER.**

Superintendent
Fran Owsik has spent 20

years at Lakewood Country Club in Lakewood N.J., tending to a Walter Travis design that dates back to 1919. Owsik, a longtime New

Jersey turf manager, has seen plenty of *Poa*. He maintains it can survive the heat if it's maintained properly. "If you're going to survive with *Poa* greens, you have to have a good root system," he says. "We aerify sometimes three times a year to establish a good root system going into June, July and August." Managing *Poa* in the heat requires maintaining a balance between using enough water to keep the turf alive but not so much the root system is overwhelmed, Owsik says. In those circumstances superintendents must not overwater and in the process "cook the root system," he adds.

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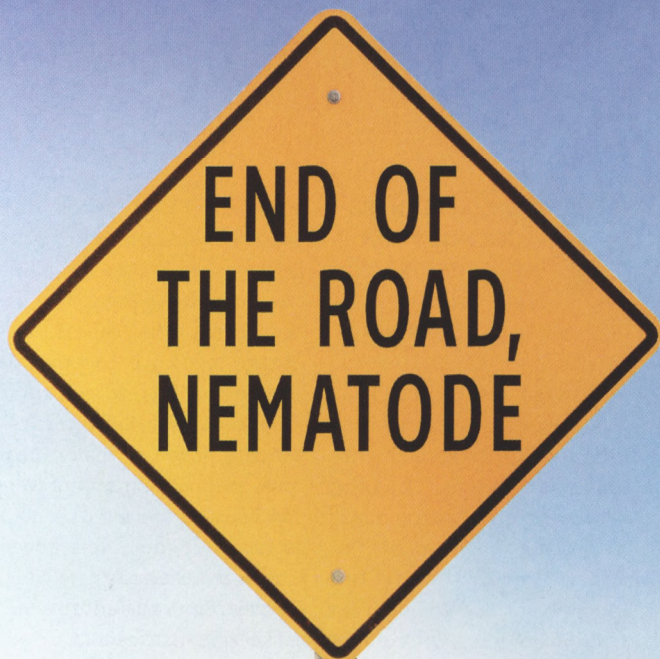


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Annual bluegrass (*Poa annua*)

7 POA REQUIRES MORE WATER THAN OTHER SPECIES OF TURF

In a January 2013 GCI article, the University of Minnesota's Brian Horgan, addressed the topic. "Poa, like most grasses, can be conditioned to grow based on the management style," he says. "So, if you give *Poa* too much food or too much water, the *Poa* will soon require the input. Light and frequent irrigation programs will confine roots to shallow depths and when the water is turned off for a day, the *Poa* dies. Hence the myth, *Poa* needs light/frequent application of water." In fact, this approach

can lead to overwatering, which weakens the root system and leaves the plant vulnerable to heat stress. Young says that superintendents working to control *Poa annua* need to vary their approach. "It's definitely essential if you're using both pre- and post-emergent herbicides to manage *Poa* to rotate your chemistries, even on an annual basis," he adds. "Poa is very resistant to some of the chemistries that are out there. So, I think it's imperative to rotate your chemistries and make sure you're maximizing the effectiveness of what we have currently on the market." GCI

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TOO MUCH OF A GOOD THING



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.

HDPE pipe is becoming more popular for use on golf course irrigation systems, with more than 50 percent of new systems utilizing HDPE mainlines and an even higher percentage using HDPE laterals. HDPE pipe works well, but only when properly designed, specified and installed. As with any product, it had some initial issues.

For starters, some systems were specified with too low a pressure rating in the pipe. Then, there were failures of new HDPE systems in Florida — dubbed “polygate.” We learned you need pipe with a pressure rating higher than the operating pressure and then some — no different than PVC.

Contractors, distributors and

designers learned the hard way you cannot weld a high-pressure rated fitting to a low-pressure rated pipe and the wall thicknesses needed to match up, which, in most cases, required machining the fittings. The industry also learned that HDPE pipe does not like chlorine or high temperatures in the soil. And, lastly, side fusion for HDPE laterals came and went. Time provided an education and most of these issues are no longer a problem. When it comes to HDPE, it's all good ... or maybe it's not.

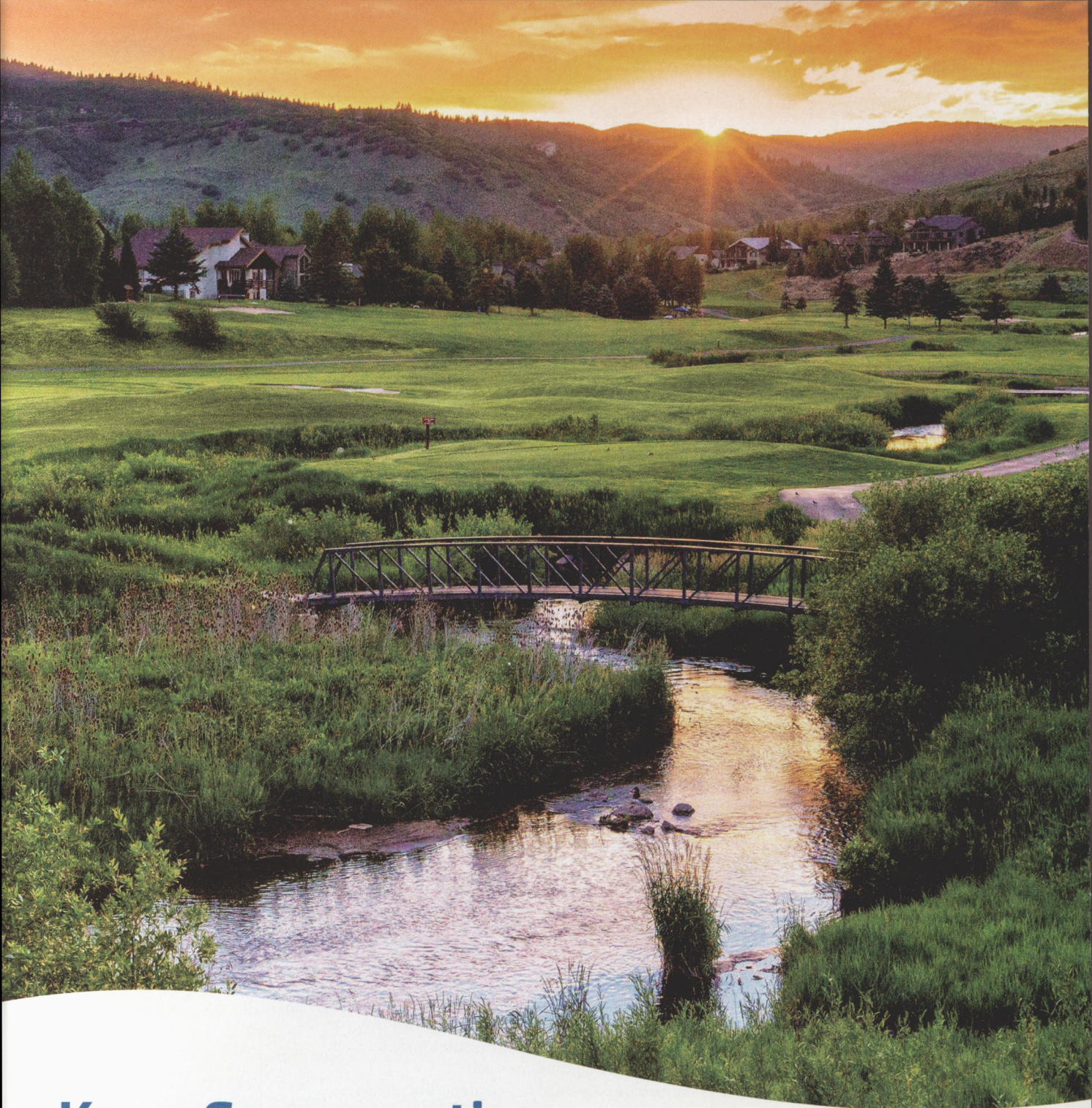
As the above issues have faded and HDPE pipe systems seem “bullet-proof,” some contractors are pushing the envelope and not necessarily in a good way. They're pushing the limits of the pipe and/or taking advantage of

what it will let you do even if it's not in the course's or irrigation system's best interest.

Because HDPE pipe is fused, you can join together very long lengths. There really is no limit, especially when you are doing 2-inch laterals. HDPE pipe is also easily installed by pulling as opposed to trenching using (hopefully) the proper equipment. If you have the right soil and enough horsepower, you can pull very long lengths. HDPE is very flexible, especially at smaller sizes so you can make turns easily — too easily. On the adjacent picture, the red line indicates the installed pipe routing. You can see the contractor put a sprinkler at the front right of the tee (as you play) and continued their pipe pull of the 2-inch pipe down the slope out into the rough, making a 180-degree turn with the pipe and then going back up the slope to the tee to install a sprinkler at the left front of the tee. No fittings, all pipe. Most likely the radius of the turn was based on how quickly the machine could turn. You could never get away with this with PVC. HDPE allowed it and the result is a bad practice, at best, and a poor quality installation as a fact. In this case, the superintendent even questioned how the contractor could do that and wondered if the pipe broke, how would he fix it. The answer? He wouldn't. It would be unfixable with that much curvature in the pipe. If it was PVC, there would have been elbows used and all the pipe would be up on the edges of the tee, not in the rough like it was shown on the irrigation plan and how the HDPE should have been installed.

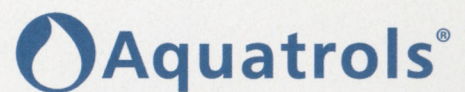
Just because the pipe will let you do such things, there is no reason to do it. Instead, it weakens the pipe and lowers the integrity of the entire irrigation system. All pipes have curvature limits, velocity limits and pressure ratings, and they should be adhered to. HDPE, as good as it is for certain applications, shouldn't be taken advantage of because it is too good. **GCI**





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by John Torsiello

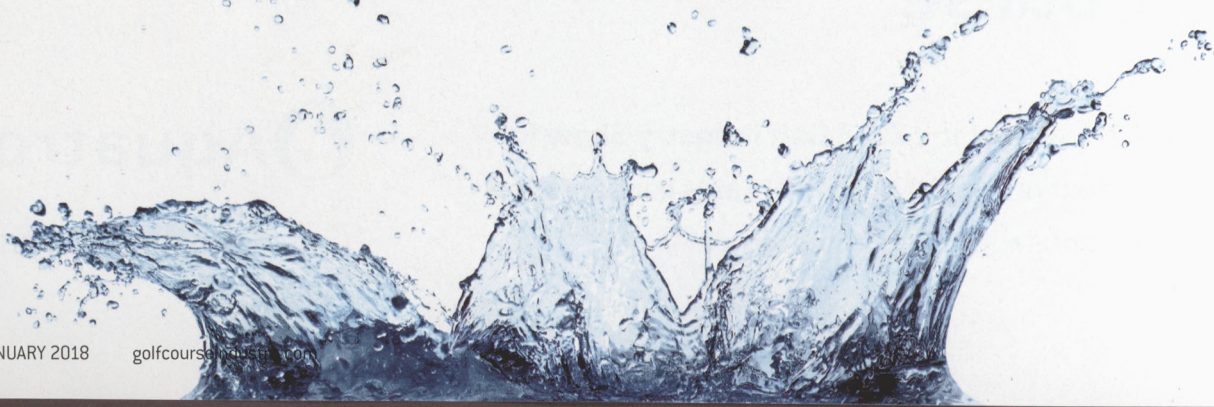
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Start with a proactive approach. Visit your pumping station come green-up time and use the hours available to you during the slower winter months to make sure your irrigation system's main driver is ready to go for the upcoming season.

"It is important to do a proper and thorough check of your pump-ing station to prevent unexpected failures," says Willie Slingerland, a Watertronics regional sales manager. "Identify possible problems before the pump station is needed for the season."





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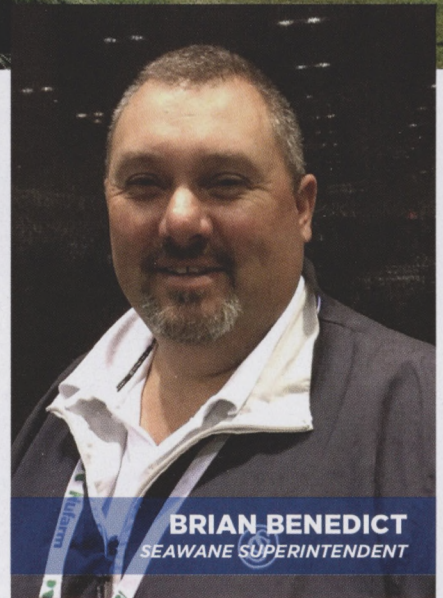
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To combat poor drainage at The Seawane Club on Long Island, New York, Brian Benedict, who has served as superintendent for 17 years, maintains a regular soil cultural routine on the course year-round. The centerpiece of his program is the Air2G2 **Soil CPR** machine which relieves **Compaction**, increases **Porosity** and enhances **Respiration** by laterally injecting air into the soil profile, creating underground fissures. These fissures enable airflow to promote percolation and water movement, and Benedict said it actually enhances the performance of existing internal drainage in his greens by allowing the water to easily find the drain lines.

"If you get a rainstorm or an irrigation cycle, you don't want mushy greens," Benedict said. "The Air2G2 allows you to move water through your profile to your drain lines."

Seawane's course is prone to compaction and water buildup. Benedict uses the Air2G2 every seven to 12 days on his 1927 push-up greens. It only takes two days to treat 19 greens. This schedule is possible with the Air2G2 because the machine can operate without disrupting play as treatment creates minimal surface disruption. By making the Air2G2 a part of his regular maintenance program, Benedict indicated that spot-treatment is rarely needed.

"When you're religiously using the Air2G2, you don't really have any problems," Benedict said.



BRIAN BENEDICT
SEAWANE SUPERINTENDENT

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Following a winter or offseason hibernation, Bill Stinson, golf pump sales manager/Eastern U.S. for Rain Bird, recommends enlisting an experienced golf pump service company/technician to perform preventative maintenance services during non-irrigation months. When possible, use the same technician who winterized the system the previous fall, he says.

This is not as daunting a task as it may seem, taking perhaps three to five hours total to complete. "It is not a lot of time, but it may not be able to be done in-house, says Brian Vinchesi, design engineer for Irrigation Consulting Inc. "But it is worth doing as it will operate the pump system better, prevent catastrophic failure and the pump system will last longer."

Preventative maintenance goes a long way. "I am a big fan of cleaning out pump houses and cleaning pump systems," Vinchesi says. "Some pump houses are dirty and cluttered and you can't move around in them, while others are spotless," he says. "The cleaner the better for equipment."

Paint should be touched up on the piping and building. Holes should be sealed. Polishing paint repels dirt accumulation, and painting the walls and floors keeps dust down. "Make sure fans and vents, as well as doors, have operating hardware and repair as necessary," Vinchesi says.

It also helps hiring a qualified service technician to go through each and every part of the pump station's operating system, Slingerland says. "There are safety issues with regard to entering and servicing a panel that most likely has three-phase power," he adds.

Another key area of the pump station to check is the control panel, says Brian Keighin, a principal of Irrigation Technologies. He recommends keeping the interior of the panel clean, making sure door gaskets are intact, pliable and providing a good seal, and checking how cabinet cooling system are operating. This keeps all electronic components at the correct operating temperature and prevents overheating and premature



A preseason inspection is recommended for golf courses looking to ensure a pump station is operating at peak efficiency when regular irrigation is needed.

Ashley Wilkinson, a golf and sports turf professor at Horry-Georgetown Technical College.

Inspections of the wet well and intake line should be done bi-annually. "I have seen numerous issues regarding this basic task," Wilkinson says. "Depending upon location, barnacles, algae, shells and other biotic issues may arise and clog the intake screen. I have seen intake lines literally fold in half as they were unable to draw water." Many times, a diver will report the intake

failure, he says.

"Check electrical connections to make sure they are tight," Keighin adds. "Check and double check that the power is off and there is not transient charge before completing this step. Also, check to make sure all mechanical fasteners are still factory tight. Clean the filter elements, replace dam-

aged/worn elements and check operation of the filter system after cleaning."

Superintendents must check the station's flow sensor calibration to determine if it is within the manufacturer's specifications, Keighin says.

In addition, pump packing seals should be adjusted or replaced if there is excessive

Keighin says.

Each motor's amp draw should be checked, as well. Too high a draw can identify a motor that is beginning to fail. "Insure that fertigation systems are plumbed properly and not dripping/leaking, and that pressure gauges are working and reading correct values," Keighin says. "And the station's heater or building heating system must be working properly to prevent possible freeze damage."

The experts agree a wise move for superintendents is to have a factory authorized pump service technician complete an annual service on the station.

"Who knows the pump station better than a factory-trained professional who has access to service bulletins and technical information on the pump station," Keighin says.

Pump station maintenance is a confusing issue. And since most people are not adept at a pump station's inner workings, maintenance often gets overlooked or mismanaged, says

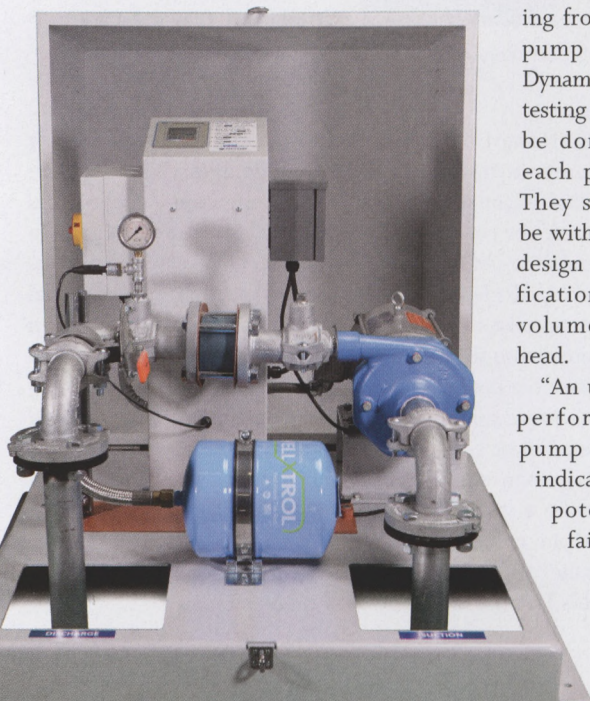
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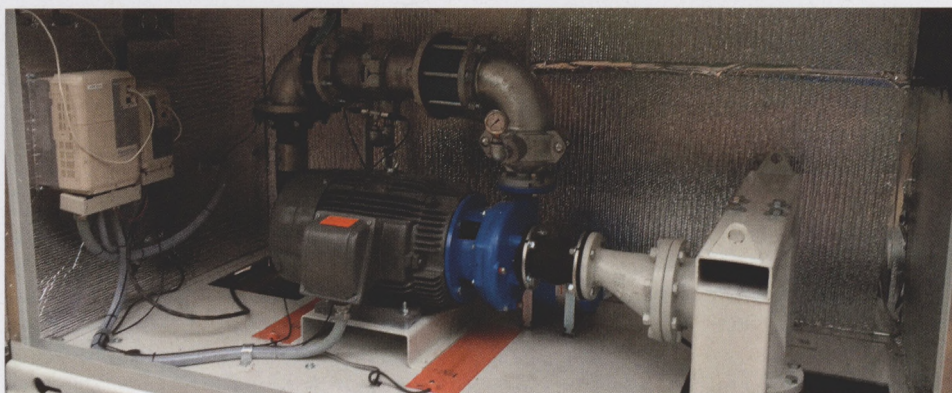
A diver should check if the intake line is still two to three feet off the lake bottom to reduce sediment being pulled into the intake line, Wilkinson says. "The diver should check for cracks in the intake line that will allow sediment or fish, and even turtles, to enter the wet well," he adds. "If this occurs, the wet well may fill with silt/mud and create low pressure issues as the vertical turbines cannot pull the water through the heavy silt."

Inspect the wet well for gaps and cracks, Wilkinson says. A corrugated wet well is prone to decompose over time, allowing metal particles to collect and, eventually, get sucked into the propellers of the vertical turbine ruining them. If the preferred concrete vault wet

water coming from the pump shaft. Dynamic flow testing should be done on each pump. They should be within the design specifications for volume and head.

"An underperforming pump is an indicator of potential failure,"





A service call with a trained professional can help ground managers avoid the perils associated with checking the electrical components of a pump station.

well has settled, the gasket keeping a water tight seal may be compromised allowing soil to leak in or, worse, water may leak out and compromise the stability of the pump station pad. Lastly, the diver should check for rust underneath the skid, inspect the condition of the turbine baskets and see if excess silt has filled the bottom of the wet well.

Checking or changing the turbine oil should be done annually. At the same time, greasing the bearings should

be done if it is not a sealed unit. Some manufacturers or service associates say to change the oil every 1,000 hours. Checking the packing should also be done. Adjustments should be made to make sure the packing is tight, so the unit is being cooled properly. If excessive heat is being created due to warm packing, the pump will eventually need serious repair.

"My recommendation would be to have all this work done through a service call," Wilkin-

son says. "However, with proper training during that call, there is no reason this annual service can't be completed in-house in the future."

Checking all electrical connections to make sure no wires have come loose should be an annual task. Small vibrations in the unit and excessive heat during operation or summer use can loosen connections, which may create a short. "I would never tell any grounds manager to open the cabinet," Wilkinson says. "It's just too dangerous.

But pulling the outside wires to see if they are tight is a reasonable maintenance task."

When restarting for a new season, the "most crucial" would be those places that are exposed to outside elements. "This means pipes and tubes that have been subjected to high and low temperatures," say Cary Harris, director of marketing for Gicon Pump. "Make sure there is also no damage from other sources, such as trucks, tractors, etc. Places that are easy to overlook are those that aren't easy to see. Inside electrical panel, critters build nests and cause damage to wires and components. Pipes that are submerged may also be damaged or rusty."

Stinson says performance testing will entail operating the station at full capacity to ensure it is meeting specified pressure and flow, and to confirm the incoming power grid can handle full demand. If the system fails the test, run each pump individually at its designed flow and pressure, to uncover performance issues.

"Don't skimp on the pump station service and repair, as it's vital and therefore mission-critical," he says. "Once the inspection is completed, all details should be thoroughly documented. This is important from a trend analysis and predictive maintenance standpoint." Ignoring known problems and the signs of potential problems will likely result in greater expense, frustration, and often "embarrassment." Respond immediately to signs/symptoms that surface from the inspection. **GCI**

John Torsiello is a Torrington, Conn.-based writer and frequent GCI contributor.



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RELATIONSHIP ADVICE



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.

Great golf courses are designed to foster good golf. Golf course architects are stereotypically viewed as masochists. In reality, we try to provide a collection of doable shots for all levels of golfers ... well, most of the time. Whether felt “in the gut” way back when, or known because of recent scientific study, we understand the relationship between golfers and the course.

Golf course architects are fond of saying “there are no rules,” but some general golf course architectural principles have developed over decades. These are often based on golf certain physics truisms, the notion of “proportionality” and knowledge that golfers prefer to shoot a decent score, meaning we recognize:

- The relationship of shot difficulty to shot length (longer is harder)
 - That punishment should fit the crime
 - That shot difficulty should relate to success on the previous shot.
- Allow me to explain.

THE RELATIONSHIP OF SHOT DIFFICULTY TO SHOT LENGTH

In general, longer shots are harder than shorter shots, because:

- A 200-yard shot 5 degrees off line flies twice as far off line than a shot 5 degrees off line from 100 yards.
- Lower lofted clubs are harder to hit than higher lofted clubs.

Several design axioms spring from this, including theories that:

- Longer approach shots need bigger greens (and wider fairway approaches) than shorter approach shots.
- Longer shots also receive deeper greens, because average golfers get less back spin on lower trajectory shots.

Similarly, greens (and fairways) should be wider on uphill shots, or shots into the wind, as head winds deflect shots off line to a greater degree. Further, many believe greens on long iron approach shots should, compared to shorter approach shots, be/have:

- Flatter front to back to allow shots to roll to back pin positions
- More gently contoured
- Lower to the ground, to allow for lower loft, roll-up shots.

PUNISHMENT SHOULD CORRELATE TO THE DEGREE OF MISS

We hear this from tour pros and low handicappers, who expect systematic reward and punishment, leading to things like:

- Intermediate rough cut.
- Flat green side sand bunkers with steep (and tightly mown) banks. Eliminating sloped sand near the green reduces plugged lies for shots missing the green by 10 feet, while a 20-foot miss finds flat sand and a good lie.

This isn't a new thought. Donald Ross built fairway sand bunkers that

were deeper on the outside edge to punish wider misses more harshly than shots that narrowly missed the fairway and found the inside edge of the bunker. However, Ross was also careful to sharply slope the last few feet of sand all around the bunker, believing it was unfair for any shot to have randomly have an unplayable lie up against the bunker lip. Historically, architects build deeper green side bunkers than fairway bunkers, reasoning golfers will use high lofted sand wedges.

SHOT DIFFICULTY SHOULD RELATE TO SUCCESS ON THE PREVIOUS SHOT

This is a tenant of classic strategy in that a golfer who plays a higher risk shot off the tee is usually given the advantage of an easier second shot. It is often applied more generally in design for balance.

For example, one architect would rank the tee shot, approach and first putt as easy (1), medium (2) or hard (3). He believed that most par 4 holes should have rankings around 5-7, for mid-difficulty, but with a mix of where the difficulty lies. Holes would be too hard if the shots ranked 3-3-3=9 or too easy if ranked 1-1-1=3. He would only design a select few holes at 4 or 8, either when the land demanded it or specifically to create harder or easier holes for variety.

Some architects believe difficulty should generally increase as the round progresses, starting with an easy opening hole, and finishing with more difficult holes to help determine the better player in a match. Others strive for some rhythm and balance of holes, avoiding any stretch of extremely hard or easy holes for variety.

None of these general rules trumps the architect's cardinal rule of relating the golf hole to the land itself. It is rarely satisfactory to put “five pounds of green on a four-pound green site.” Having a somewhat random mix of greens, and perhaps a touch of whimsy, is just as important as any hard and fast rule or theoretical design axiom. **GCI**

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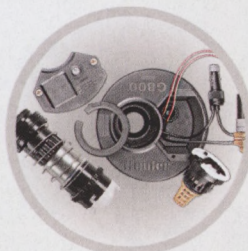
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The maintenance team at Gull Lake (Mich.) Country Club is responsible for maintaining two cross-country ski trails.

SNOW, ICE AND CLAY

Providing recreational opportunities at a facility with a short golf season requires superintendent Jesse Shaver and the Gull Lake Country Club team to use a different set of construction and maintenance skills.

By **Guy Cipriano**

Greens aren't the only recreational surfaces that must be consistent at Gull Lake Country Club.

Attracting members and revenue to the western Michigan club, where a prolonged golf season might last seven months, requires offering winter and nighttime activities.

Start storing the mowers in November. And tune-up the snowmobile?

The evolution of private clubs means employees such as Gull Lake superintendent Jesse Shaver, assistant superintendents Drew Boike and Craig Veeder, and equipment manager Sam Holysz must resemble fellow Michiganiite Tim "The Toolman" Taylor. Since becoming Gull Lake's superintendent in 2010, Shaver has overseen the construction and maintenance of an ice rink, intermediate and advance cross-country ski trails,

and a bocce ball court. The non-golf recreational areas complement an 18-hole golf course supporting 12,000 annual rounds in a condensed season.

Snow or *Poa*, Shaver's team, which includes five year-round employees and swells to 15 in the summer, finds ways to help Gull Lake expand its amenities, bringing multiple generations to the club's 110-acre grounds. "To me, that's the fun part of the job," Shaver says. "I'm not just taking care of the golf course every day. I get to do a bunch of different things and learn a lot more about different areas of life and what it takes to make a club viable and successful."

Shaver knew Gull Lake planned to expand its offerings when he applied for the head superintendent position, and turf concerns partially sparked his first non-golf recreational project. Gull Lake lacked formal cross-country ski trails, so members unknowingly crossed greens and fairways during winter workouts. Shaver studied how other Michigan clubs handled skiing and presented members with a plan in 2011

to route maintained trails away from key golf course features.

"I talked to a bunch of different people, researched what we needed, gave them a price and they said, 'Do it,'" Shaver says. "Then we had to do it." The result is two trails, one hillier than the other, consisting of 2 ½ miles of skiable surface. Shaver laughs when describing how a tractor pulled the groomer during the first winter of trail maintenance. "That was

a pain because we got stuck all the time," he says. The club purchased a snowmobile the following winter, and Shaver says during an average week – snowfall totals quickly fluctuate – his team spends "four to five" hours maintaining the trails. Snow is packed in layers at the beginning of each winter, creating the necessary base to handle the wear produced by skiers.

Trial, error, ingenuity and a sense of humor allowed Shaver's team to handle its next winter project: the construction of a 50' by 70' ice rink. Members had previously skated on Gull Lake, but erratic winter temperatures raised safety concerns. The club decided to build a rink in a section of the parking lot bordering the platform tennis courts with easy bathroom and hot drink access. Constructing the rink is akin to using an erector set, with frames and boards labeled and arranged in an orderly fashion, although

creating a flat surface represented a dilemma because the parking lot falls 18 inches where the rink sits. Freezing additional water on the lower side is a tricky task and offered no guarantee of yielding a consistent surface. The solution, coincidentally, originates from a golf course maintenance staple. Dispersing 90 tons of compacted topdressing sand on the lower end of the parking lot produces an even skating surface. The sand purchased for the rink is used on the golf course the following spring.

The rink is collapsible and a member who owns a trucking company donated a trailer for storage. Course accessories are stored in the trailer during the winter. The rink opens in mid-December. The average winter week, Shaver says, includes six hours of rink maintenance, and Gull Lake's version of a Zamboni is a handheld unit using a hose. An operator walks around the ice to smooth the surface.

The crew first constructed



Gull Lake Country Club installs a 50' by 70' ice rink in its parking lot each December. Superintendent Jesse Shaver says the rink requires six hours of maintenance during a typical winter week. Gull Lake's version of a Zamboni is a handheld unit using a hose.



Playing bocce ball on a Har-Tru clay surface is a popular non-golf activity at Gull Lake Country Club.



PLAYING CONSISTENCY IS THE NAME OF THE GAME

at Victoria National Golf Club



Victoria National Golf Club, in Newburgh, Indiana, is ranked 43 in Golf Digest's 100 greatest golf courses in America. Best Sand, a proven, well-known brand of Fairmount Santrol, is trusted throughout the country. Together, Victoria National and Best Sand continue to create repeatable experiences with playing consistency for members, guests, and professionals at the nationally acclaimed course in southwest Indiana. "When you're on a national stage, your course must be as consistent as possible whether you're talking about the hazards, tees, or greens," said Kyle Callahan, director of Agronomy for Victoria National.

Preserving the design

Callahan and his team have a primary goal: to preserve the 418-acre course designed by Tom Fazio, the award-winning golf course architect. The team rakes 58 bunkers over two acres five times per week. Besides raking, Callahan's team edges and weeds, in addition to removing silt and shifting sand into proper places after checking depth and firmness totals. Bunker maintenance, other than raking, accounts for three full weeks each

season on this course. Annual offseason enhancements include replacing some of the bunker sand. Since 1998, the team has filled them with Best Sand's bunker sand. The sand ensures consistent conditions for championship play and the everyday golfer.

Maintaining the consistency

High-quality sand is the name of the game. Callahan understands the finer points of sand selection to maintain playing consistency. "At a higher-end club, consistency is a big thing with players, especially when you're hosting an event," he said. "When you play one bunker that's soft and one that's firm or you have a soft green and a green rolling faster, that's really where you would be ridiculed as a superintendent or director."

That's not the case at Victoria National where these experts keep everything on course. Presenting a clean, white appearance that accentuates the Fazio design also factors into the sand selection. Best Sand's Tour Grade Signature Blend enables the bunkers to keep their desired appearance following rain. "Obviously, the sand color is vital," said Callahan. "How well does the sand hold color? This is an important point in

such a widespread natural area. White sand really makes the course pop."

Supporting the customer

In addition to the sand's consistency of play and color, Callahan compliments Best Sand representatives for adapting to his schedule. The professional relationship with Terry Gwinn, Best Sand's sales manager, allows Callahan to meet the all of the job's demands, including preparation for the United Leasing & Finance Championship each spring at Victoria National.

Gwinn also enjoys working with Callahan and his team at Victoria National because of their skilled approach to work and interest in high-quality sand. Best Sand is the only bunker sand that can be found on 30 of the top 100 golf courses in the US. Professionals and everyday players appreciate the championship-level look.

Callahan values the outstanding product and customer service. "That's probably the biggest thing about our network: Can you respond to a crisis? With Terry, I call him and say, 'Can you help?' He jumps through hoops. That's always big for us."



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the rink in 2012, a year before bocce ball arrived at Gull Lake. A patio renovation emphasizing gathering areas made bocce ball a fit for the club, again turning Shaver into a recreational detective. Shaver studied the one court he could find in the area and he worked closely with the landscape contractor who installed the patio. Golf course renovations force a superintendent to spend hours researching grass varieties before recommending a surface to a committee or ownership. Bocce ball court construction propels a manager into the Har-Tru clay vs. oyster shell debate. Shaver selected Har-Tru clay which needs groomed, rolled

and even watered to limit dust during dry stretches. Maintaining the court requires around four hours per week, with Boike and Veeder using their baseball experience to produce a splendid surface.

"They are really hungry to perfect it and make it better, and they understand how the weather is going to affect it," says Shaver, who frequently demonstrates progress to members and exchanges ideas with industry peers via Twitter. "It's been a learning curve for all of us. How do you take care of a bocce ball court? We didn't even know what one looked like, so taking care of it was a trial and error, talking to people

and finding how they take care of their tennis courts, how some of their tips and tricks can help us with our bocce ball court. It's the same thing with ski trails and ice rink. I kind of figured it out, trained one of my assistants and he trained another guy. It just trickled down the line."

The bocce ball court and ice rink are lit, expanding nighttime revenue opportunities. Add placing Christmas decorations around the club, constructing a Halloween house, and maintaining beach and yacht areas, and Shaver's team has provided entertainment for every grandmother, grandfather, mother, father,

daughter, son and guest Gull Lake services.

"It's an evolution of the superintendent's job," Shaver says. "And it's the evolution that country clubs specifically need to make or have been making over the years. The days of dad spending five days a week at the club are over. Those days were a great time, but you have to really appeal to the families and younger generations and have something for the kids to do and have something for the mothers to do or a lot of these families aren't going to be members anymore, or won't be members to begin with." **GCI**

Guy Cipriano is GCI's senior editor.

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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.

MECHANIC'S CREEPER CHAIR

The Model 7519 Cub Cadet tractor seat was acquired from Northern Tool (\$50) and was used on an old backhoe for five years and then it was repurposed. The rear wheel rim is a Cushman Model # 898531 from an old three-wheel model. The rim is welded to two pieces of 6-inch by $\frac{3}{16}$ -inch thick angle iron that is bolted to the seat bottom. The black-colored steel plate was recycled from an old square truck seat that measures approximately 14 inches and the wheel rim is welded to it. The six 2½-inch creeper caster wheels were acquired from Napa (\$20). It took about three hours to build. Mike Davies, superintendent, and Jim Zunker, equipment manager, make up the great team at the 27-hole Superior National at Lutsen, Lutsen, Minn.



GATE VALVE KEY HOLDER

The irrigation system gate valve/isolation valve key is transported efficiently on the Club Car Turf 2 turf vehicle. Two pieces of 1½-inch square tubing are each opened on one end in a "U" shape, are bolted to the dump body and fitted with a rubber lining so the key does not rattle. Two adjustable Carr Lane Toggle Clamps Model #C1250-VTC are welded to a piece of flat steel that is welded to the square tubing to hold the key in place. Weld a 1½-inch by $\frac{3}{16}$ -inch thick and a 1-inch by $\frac{1}{8}$ -inch thick piece of flat steel together in a "L" shape and bolted to the front of the bed to keep the handle from moving. It cost less than \$50 for parts and it took about 1½ hours to fabricate and install. Lonnie Aller, superintendent, and Phil Taylor, equipment manager, from The Golf Club at Black Rock in Coeur d'Alene, Idaho, came up with another great idea.





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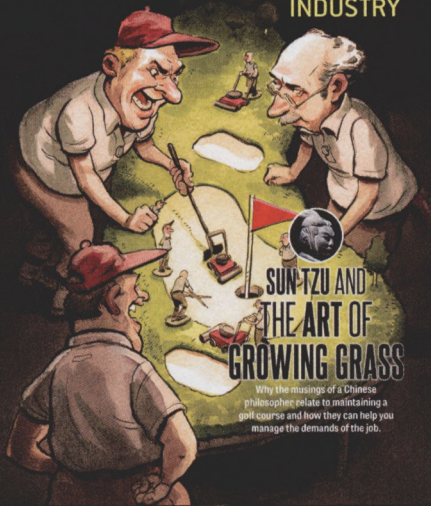
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GOLF COURSE INDUSTRY



SUN-TZU AND THE ART OF GROWING GRASS

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2018 STATE OF THE INDUSTRY

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ROUNDS

AVERAGE
NUMBER OF
ROUNDS IN
2017

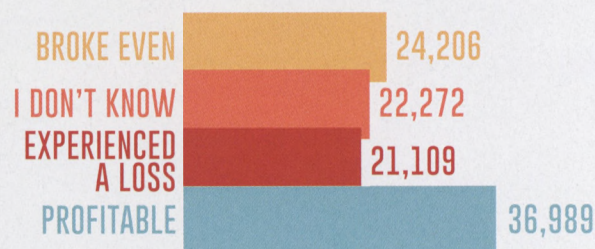
28,598

PUBLIC VS. PRIVATE

34,547 AVERAGE ROUNDS, PUBLIC COURSE

21,741 AVERAGE ROUNDS, PRIVATE COURSE

AVERAGE NUMBER OF ROUNDS AT COURSES THAT, IN 2017, FINANCIALLY...



Enhanced products could be another route to revenue growth. A Global Golf Advisors analysis created for the City of Los Angeles municipal golf system, which includes seven 18-hole, four nine-hole and two par-3 courses, revealed that customers on limited golf budgets are willing to spend a few extra dollars to play an enhanced course. The ASGCA-SLRG study found that course renovations are the most coveted enhancement by public and private facility operators.

In his own backyard, the competitive Phoenix-Scottsdale market, Spangler says customers have responded "really well" to renovations at Troon North's Monument course. Renovations included returning green complexes to their original shapes and sizes, resurfacing greens and collars,

and renovating bunkers.

"You feel like there's life back in your facility," Spangler says. "But it's not just golf course supervisor staff or the superintendents. It's the members, it's the players that are coming to play the golf course. Everybody senses that this tide is rising and getting excited about it."

"It's not like back in the day when everybody was playing golf with a corporate platinum card and expensing it and there were 250 courses built a year. But the industry is certainly moving forward and everybody can sense it in all aspects of the operation, on the budget side, on the renovation side, the morale of staff and the demand for tee times. It's nice, consistent growth." GCI

Guy Cipriano is GCI's senior editor.

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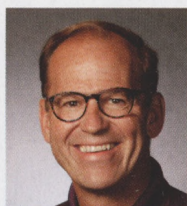
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SUPERINTENDENT
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OBSERVATIONS ON 2018



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

As we put this year's State of the Industry issue together and took a long, hard look at the data, we debated about how to summarize what we found as a big headline for our cover illustration.

Was it fair to say that, "The Golf Business is Back?" I rejected this one because I hate the notion that our business is getting "back" to a fake boom time when a lot of awful decisions got made. It also reminds me of the current golf media obsession with Tiger being "back." Puh-leeze! Can't we just run our business like a business without relying on the return of Eldrick "The Messiah" Woods to succeed?

Was it more accurate to say that, "We're Getting Healthier?" Well, that's true too but it doesn't tell the whole story. It's unquestionable that industry suppliers have been pleasantly surprised with sales in a "slumping" golf market the past few years and the number of courses closing has held steady at about 175 a year, but that's not "health" in the traditional sense of growth and expansion.

Should we stick with, "The Building Boom Continues?" Duh. We'd just be telling you what you already know, although I think the information we developed – along with the study done by our friends at the ASGCA – provides a new level of insight into what kind of remodeling is being

done and why.

So, those possible summary statements are true, but we went with "The Great Reinvestment" as the truest appraisal of the state of golf in 2018 for a bunch of reasons.

First, it's undeniable that we're in the midst of the biggest remodeling boom in golf history. It's finally occurred to everyone that courses must change and improve to compete.

Second, the amount of money being spent in a "flat" market is astounding when you total it all up. A couple of billion dollars a year is being poured into improving bunkers, recontouring greens, fixing nagging drainage problems or the soup-to-nuts redesigns and restorations we're seeing at the highest end of the business. Finally, since it's not about getting "back" to the old days, it must be about reinventing golf for the future. That's what we're seeing now.

I won't lie ... the Great Reinvestment will not be a rising tide that lifts all boats and magically solve golf's broader systemic problems (time, perceptions, women, kids, etc.). Instead, it's going to further separate the Haves and the Have Nots in our industry. The U.S. simply can't support 15,000 golf courses. The fact that smart operators are investing and giving picky golfers a better product will doom a lot of stale, badly run facilities that have been limping along for years.

The divide is going to widen into a chasm and many small, underfunded operations won't be able to cope with the competition and the inevitable, grinding rise of labor costs. In the future, there will be two kinds of golf courses: those that manage labor costs effectively and those that become condo complexes.

That said, I'm heartened by the willingness of thousands of courses around the country to reinvest now to ensure better futures decades from now. That's both farsighted and a sign that banks have regained some confidence in our happy little industry. Sure, many clubs are self-financing their renovations, but others have borrowed. That could not have happened five years ago.

I guess I'll pat myself on the back for years of saying that a "smaller, smarter golf market is emerging." What I didn't see coming was how aggressively operators are investing in that scenario. They see, at the local level, opportunities not just to survive, but to thrive. In fact, a bunch of them are just kicking ass right now. A surprising number of clubs are posting astonishing profits ("excess revenues") these days and there's no reason to think that will change absent some catastrophic event that will make us all forget about golf's petty problems.

So, here we are nearly a decade after our generation's Great Recession, and instead of talking about the death of golf, we find that we're in the midst of the Great Reinvestment. Golf is finally getting smart and supply and demand will even out over the next decade. We're incredibly fortunate in many ways that we didn't kill our own industry with stupidity and overbuilding (though we tried). Now it's up to us to steward the business of golf the same way you steward your property ... intelligently and always with an eye on the long term.

Here's wishing you an awesome 2018 ... and a bright future for all of us. **GCI**



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