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2016 STATE OF THE INDUSTRY REPORT

Armed with bigger maintenance budgets and backed by their bosses, superintendents appear poised to continue the heavy lifting at their facilities.





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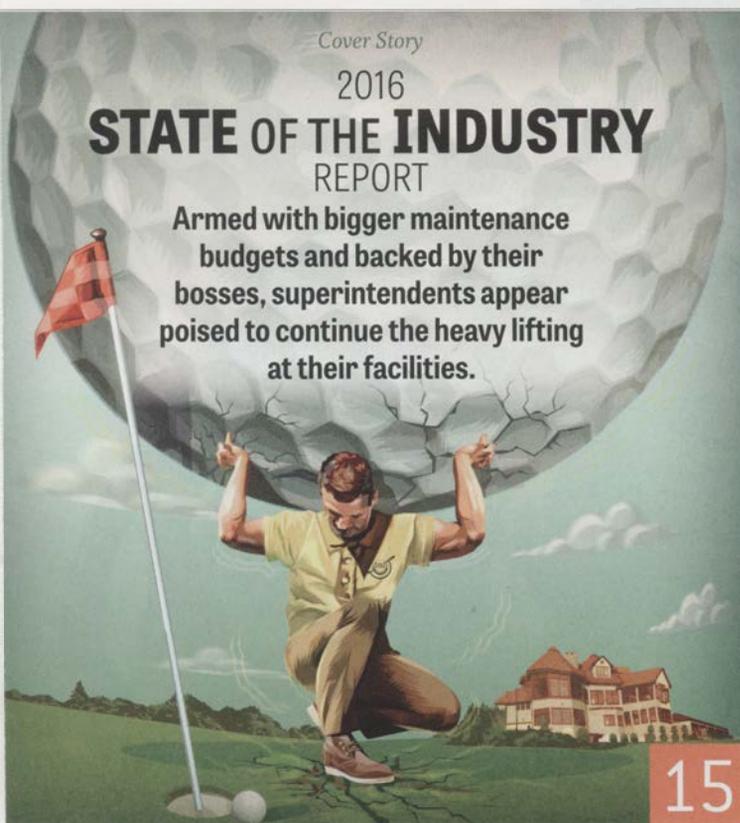


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ON THE COVER

Freelance illustrator Matthew Laznicka created this month's cover design.



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2016

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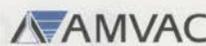
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TEERING OFF

SCISSOR-KICKING IN SAN DIEGO

I started sprinting and leaping like Sergio Garcia in the 1999 PGA Championship when my bosses told me to write 2016's first "Teering Off" column. You should have seen the expressions among other GIE Media "Green Team" editors when I attempted a running scissors kick inside our intergalactic headquarters.

We are using this space to introduce the 2016 Super Social Media Award winners. I like to write. I like to tweet. So, I'm writing about tweeting – and blogging, Facebook posting, Instagram sharing and video producing – in the same column.

We like to think of our GIS gathering as something bigger than just handing a few excellent communicators jazzy plaques. #GCITweetUp16, which will be held at 3 p.m. Feb. 10 at Aquatrols Booth #3132 inside the San Diego Convention Center, is about leaving your comfort zone. It takes courage to share your work on social media, where anybody with a username and password can see it. Stop by the booth and you will meet people who once harbored similar trepidation about mixing work and social media. These are the same people who now consider Twitter as valuable of a job tool as a rake or shovel.



Guy Cipriano
Assistant Editor

More of you are taking the bold step of using social media for work purposes. How do we know this? GCI's legion of Twitter followers has increased from 4,300 to more than 9,400 in the past 18 months. If you know of somebody in the industry thinking about starting a Twitter account, tell them to do it immediately. We've set high goals and we want to reach 10,000 followers by the end of GIS.

This year's Super Social Media Awards nominations tell us more of you are using social media for work purposes. Dozens of qualified candidates from multiple continents made our final decisions as difficult as two-putting from 75 feet on a Pete Dye-designed green.

Selecting award winners represents one of our most difficult annual tasks. That's a testament to the volume and quality of industry folk using social media. Lots of you bring your "A" games to computers and mobile device before, during and after exhausting work days.

Let's hope everybody brings their best social media performance to San Diego. Who knows what connection you might make while roaming the show floor or sitting in a conference room? For those who can't make it to San Diego, we encourage you to follow along @GCIMagazine.



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We are also adding a new award to #GCITweetUp16: Megaphone Award for Outstanding Advocacy. Pat Jones described the significance of the megaphone last month. Enter bit.ly/1lXj95n into your web browser for the explanation.

West Coast irrigation consultant Mike Huck is the first winner of the award. He's a fitting selection for numerous reasons, none bigger than for taking a leadership role as California superintendents handle the politics of a prolonged drought. Huck uses his Twitter account @IrrTurfSvc to share news related to the drought. He

gives the industry a credible and, more importantly, visible presence in a region where it's often considered safer to keep quiet and hope a few steady rains silences golf critics.

The rest of our winners display similar boldness. They just might be capable of convincing someone to execute a running scissors kick during the middle of a work shift.

#GCITWEETUP16

KAMINSKI AWARD

Paul Carter

The Bear Trace at Harrison Bay, Harrison, Tenn.

BEST OVERALL USE OF SOCIAL MEDIA

Rick Tegtmeier

Des Moines Golf and Country Club, West Des Moines, Iowa.

Joe Wachter

Glen Echo Country Club, St. Louis, Mo.

BEST TWITTER FEED

Eric Bauer

Bluejack National, Montgomery, Texas

Paul Koch

University of Wisconsin, Madison, Wis.

Patrick Reinhardt

Georgia Southern University Golf Course, Statesboro, Ga.

BEST BLOG

Joel Kachmarek

Tacoma Country & Golf Club, Lakewood, Wash.

Brad Novotny

Hillendale Country Club, Phoenix, Md.

BEST VIDEO

Graeme Roberts

Camberley Heath Golf Club, Surrey, United Kingdom

MEGAPHONE AWARD FOR OUTSTANDING ADVOCACY

Mike Huck

Irrigation and Turfgrass Services, Orange County, Calif.

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Painting Tigers

South Carolina club's maintenance crew kicks Clemson football fever up a notch for its membership with a unique turf painting project.

By Guy Cipriano

Superintendent Chris Vincent and The Reserve at Lake Keowee maintenance crew used turf to increase the fervor surrounding the College Football Playoff.

Vincent's team painted Clemson's orange Tiger Paw logo in the middle of a 50-yard football field they created on the club lawn. The idea stemmed

from The Reserve's desire to honor Clemson's perfect regular season and first College Football Playoff berth. The Reserve, a high-end private club in Sunset, S.C., is head coach Dabo Swinney's home club.

Clemson euphoria has occupied club chatter throughout the fall and early winter. That euphoria might have peaked when the painting abilities of the maintenance crew was captured via drone images. The quality of the final product even surprised Vincent.

"It turned out much better than we intended," he says. "We were first a little leery that maybe we didn't have enough paint."

How did Vincent and assistants Bradley Robbins and Bart Stephens replicate a recognizable part of Death Valley?

First, they received plenty of cooperation from Clemson. Besides having Swinney as a member, the club will co-host the Clemson Invitational this spring. The relationship between the school and club is so strong that Clemson loaned The Reserve the stencil used to paint Memorial Stadium and provided the orange paint the crew needed to complete the project.

Vincent says it took 30 hours of work – three employees working 10 hours each over a two-day span – to paint the Tiger Paw and a matching set of The Reserve logo as well as line the field. The Tiger Paw measures 36 feet by 36 feet.

Below-freezing temperatures delayed work on both mornings. Tifway 419 Bermudagrass covers the lawn, and the drone images show the turf was in a semi-dormant state when the painting was completed.

"We have been painting for a while, doing the club logo and other things in different areas," Vincent says. "But this was our first big endeavor like this. We were out there with thermometers, waiting for temperatures to get above 50. The paint would almost liquefy when it was too cold, so we had to wait until the temperatures got up. The biggest challenge for us was making sure the soil and air temperature was warm enough for the paint to actually adhere to the turf."

Other keys to painting something big at a golf facility, according to Vincent, include having an accessible area where the work can be showcased and the proper equipment. The lawn was an obvious spot for The Reserve to display the Tiger Paw while a backpack sprayer helped deliver a consistent paint coating.

"It worked out as a win-win," Vincent says. "We were able to say congratulations to Clemson and Dabo and to get our club a little bit of recognition. We were glad to do something to help with marketing and getting our name out there."

From THE FEED

If a wildlife issue arises at your course, who do you think will most likely be responsible for handling it? The golf pro? Not as long as members need putting tips. The general manager? Not as long as your facility offers amenities besides golf. In most cases, solving wildlife problems will fall on ... the superintendent. To help superintendents and their crews manage misunderstood critters, we profiled snakes on our December 2015 cover (bit.ly/1MWdKJT) and alligators on our October 2014 cover (bit.ly/1OUv4qS). After releasing the story about snakes, we asked our Twitter followers what critters found on their respective courses pique their curiosity.



Dan Mausolf
@DanMausolf
Moles



Brian Burke
@S3Cgolf
Sphecius speciosus eastern cicada killer.



Ryan Gordon
@RyanWGor
Elk



David Wally Gresham
@wallygresham
Geese and deer



Timothy Moraghan
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How about the low handicap member?



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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.

Many golf course executives and managers say their most valuable asset is the course itself, those acres of green outside their door that members and customers pay good money to enjoy. The most successful executives and managers, however, look past the green and see their people as their most valuable resource.

The truth is few companies flourish without smart, creative and engaged employees. That's why finding, developing and retaining good people with the right skills – what the human resources people refer to as talent – is critical.

So how do you go about the hiring process? Like most people, do you gather a few resumes, conduct a few interviews (maybe very few) and make a job offer? If hiring for key positions is a casual exercise, maybe even one delegated to a mid-level manager, you're doing yourself and your organization a disservice.

The hiring process requires discipline and time. It's tempting to skip important steps to get someone on board quickly, but that's usually a strategy for disaster. A bad hire has bad repercussions, which will only worsen.

Hiring comes with no guarantees, but here are four steps that increase the odds of landing the right person for the job.

REVIEW THE JOB DESCRIPTION

The hiring process should start long before any candidate walks in the door. The first step is making sure the job description thoroughly describes the skills and experience the position requires. If the job description hasn't been updated in more than a year, review it to make sure it still defines the ideal candidate. Ask other managers what the last person in this job needed more of – and less of.

DETERMINE THE RIGHT COMPENSATION

Do some online research and survey others in your market to see what they're paying for similar positions. Reach out to associations that serve owners, managers and superintendents and ask for available salary information. The goal is not to hire someone at the lowest salary possible. Instead, seek to hire someone who believes the salary and overall compensation provide incentive to give his or her best at all times.

CONDUCT MULTIPLE INTERVIEWS

One interview is seldom enough to learn everything you need to know about a potential employee. If you believe a person is a good fit, bring him or her back a second or third time so the candidate can spend time with other managers and staff. Resist the temptation to dominate the interview; let the candidate do most

of the talking. Do at least one interview outside your office; you'll learn a lot about a person's true personality over breakfast, lunch or a round of golf.

CHECK REFERENCES

Always take the time to check a candidate's references before making a job offer. Previous employers – especially those you know – will give you insights even the most thorough interviews will not uncover.

Here are a more tips gathered over a career of interaction with our clients:

- Look for servant leaders, people who routinely put the needs of others before their own.
- Prioritize integrity. People who do the right thing – even when no one is looking – define the character of your organization.
- Hire people who share the values, passions and sense of humor of the organization. Almost all skills can be taught and improved; a willingness to learn and an engaging personality are difficult to instill.
- Ask yourself: Can this person not only do the job I'm hiring for today, but also one with more complexity and responsibility down the road? If the answer is yes, you may be hiring a longtime employee.
- Hire someone who doesn't look like you or think like you. Golf needs diversity in ethnicity, cultures and thinking if it is going to grow – and so does your organization.
- Hire the scrapper. Resumes tell a story, but not the whole story. A person who has had none of the advantages of someone with a stellar resume – she didn't go to a prestigious school and hasn't worked for a nationally regarded club – may be just the person you need. Scrapers have had to struggle and work harder than most for what they've achieved. Scrapers don't give up on themselves – or the job that's in front of them. **GCI**

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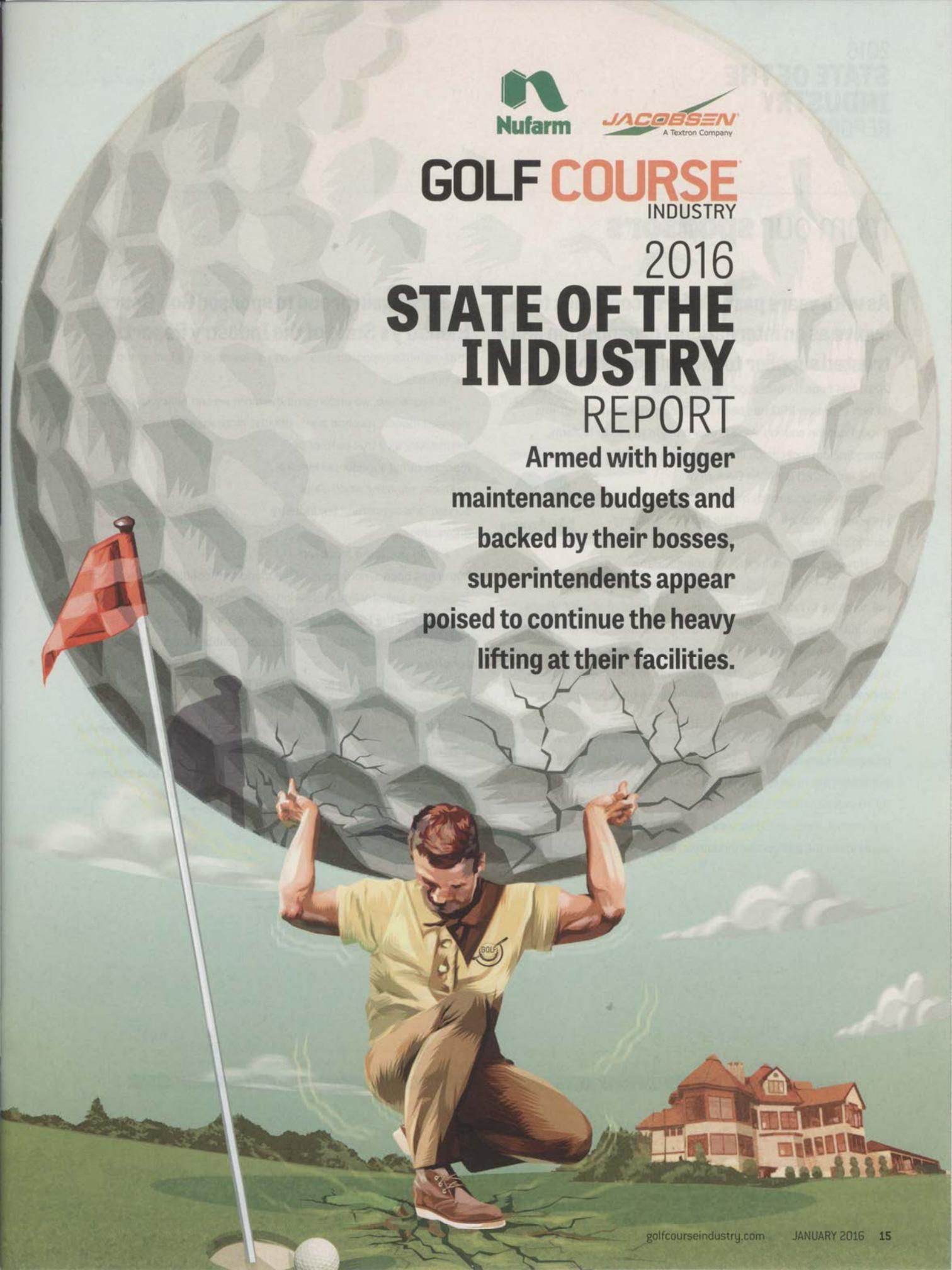
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GOLF COURSE INDUSTRY

2016 STATE OF THE INDUSTRY REPORT

**Armed with bigger
maintenance budgets and
backed by their bosses,
superintendents appear
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lifting at their facilities.**



from our **sponsors**

As with years past, Nufarm continues to evolve as an international organization and a trusted supplier to the golf industry.

2015 has been no exception for BIG NEWS announcements. The launch of Anuew PRG has been in full force with demo programs throughout the country. Aloft is now brought to you by Nufarm, expanding our insecticide line up. And a new leader at the helm, CEO Brendan Deck from

Australia has already made strides in getting to know our customers; driving the Nufarm customer-centric culture.

However, NEW is not the only thing Nufarm has been up to. IMPROVED is also a theme we embraced in 2015 and will continue to ride in 2016. Updates in processing at our Chicago manufacturing plant will continue to improve production and supply. An upcoming launch of a new micro site for distribution and golf course superintendents will bring valuable content to your fingers faster. And improved customer service tools will increase transparency in the ordering process.

As we eagerly look forward to 2016, we anticipate work within all categories serving the golf course market. Insecticides, fungicides and herbicides are in development to join our popular product line including 3336 Brands, Affirm, Last Call, Millennium Ultra II, Stellar and Tourney. Nufarm will continue to innovate in chemistry and service to provide solutions to the golf course industry's most challenging pest problems.



We are again proud to sponsor Golf Course Industry's State of the Industry Report. The

study identifies opportunities we can all leverage to improve and grow our businesses.

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Moving forward, Jacobsen will continue to work as a true industry partner, providing products, service and support that make you more successful every day.

Best Regards,

A handwritten signature in cursive script that reads 'David Withers'.

David Withers
President
Jacobsen

BUDGET

Want a compelling reason to believe 2016 will be a better year for the industry than its immediate predecessors?

Study the budget numbers on these pages.

The average non-capital operations budget is increasing from \$697,000 to **\$750,000**, a robust and encouraging **13.2 percent increase**. For those wondering, the average maintenance budgets in 2012 and 2013 were \$651,392 and \$622,500, respectively. **More than half** of superintendents (52 percent) will see their **maintenance budgets increase** in 2016 while only **16 percent** will be forced to **trim** expenses.

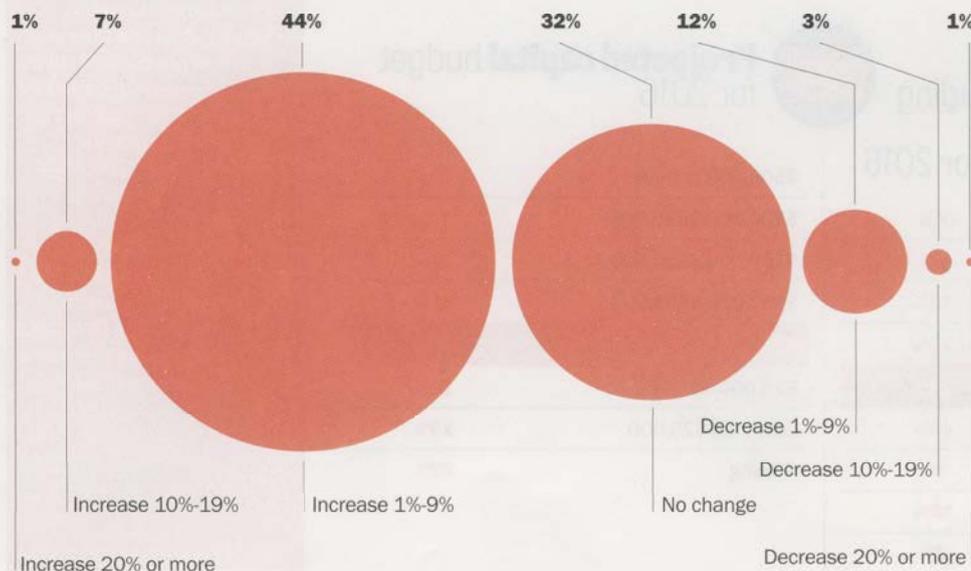
Of the 18 budgetary line items annually included in the survey, 12 will experience spikes in 2016, including all forms of pesticides and fertilizers. Equipment suppliers should be primed for a solid 2016. The **biggest budgetary rise will be in mowing/cultivating equipment**, with the average course spending \$42,800 on iron in 2016 compared to \$31,300 in 2015.

Receiving the necessary financial resources to produce a quality product isn't a major concern among superintendents entering 2016. **Forty-three percent** of superintendents say they are **"very confident"** the maintenance department will have the financial resources to succeed in 2016. Only 4 percent say they are "not confident at all."

Spending on capital projects should be conservative in 2016, with the average facility devoting \$94,500 to course improvements, a 31.5 percent decrease over 2015. Only 3 percent of superintendents indicated their facilities will spend more than \$500,000 on capital improvements this year.

Budget changes

2015 vs. 2016



Confidence maintenance department will have financial resources to succeed in 2016



Budget chart



	2015	2016
AVERAGE TOTAL	\$697,000	\$750,000
Water	\$22,800	\$17,300
Fuel	\$29,200	\$25,100
Mowing/cultivating equipment	\$31,300	\$42,800
Handheld equipment	\$2,410	\$2,470
Course accessories	\$4,410	\$5,060
Energy	\$21,300	\$21,800
Shop tools	\$2,860	\$3,220
Irrigation parts, heads & maintenance	\$8,410	\$7,870
Fungicides	\$34,100	\$34,200
Herbicides-preemergent	\$6,370	\$6,700
Herbicides-postemergent	\$4,260	\$4,590
Insecticides	\$6,190	\$6,770
Granular fertilizers	\$20,300	\$22,300
Liquid fertilizers-biostimulants/foiliars	\$12,100	\$13,500
Wetting agents	\$6,150	\$5,180
Plant Growth Regulators	\$4,570	\$4,640
Seed	\$7,390	\$6,350
Aquatic weed control	\$2,570	\$2,220

Projected non-capital operations budget, including labor and overhead but excluding water costs, for 2016

\$2.0 million or more	4%
\$1.5-\$1.99 million	6%
\$1.0-\$1.49 million	15%
\$750,000-\$999,999	13%
\$500,000-\$749,999	25%
\$400,000-\$499,999	10%
\$300,000-\$399,999	9%
\$200,000-\$299,999	10%
Less than \$200,000	6%



Projected capital budget for 2016

\$500,000 or more	3%
\$300,000-\$499,999	5%
\$200,000-\$299,999	7%
\$100,000-\$199,999	13%
\$50,000-\$99,999	20%
\$25,000-\$49,999	14%
Less than \$25,000	13%
Nothing	23%



METHODOLOGY

Golf Course Industry contracted with Readex to assist in the creation and to facilitate the distribution, completion and computation of the 2016 State of the Industry survey. This is the second year GCI has worked with Readex, an independent research company located in Stillwater, Minn., for this report.

The survey sampled approximately 2,488 emailable GCI recipients classified as superintendents at unique golf courses (duplicate company/address records were removed). Sample members were contacted beginning on Nov. 24, 2015 and the survey closed for tabulation on Dec. 7, 2015, with 267 respondents who indicated they are golf course superintendents or equivalents. Forty-seven percent of respondents worked at private courses, 20 percent at public/daily fee courses, 16 percent at semi-private courses, 11 percent at municipal courses and 6 percent at resort courses. Superintendents from 46 states and Canada responded to the survey. California, Florida, North Carolina, Pennsylvania and Ohio were the most represented states in the survey, with each state accounting for 5 percent of the total respondents.

As an added incentive to complete the survey, GCI committed to making a substantial donation to the Wee One Foundation, a charity group started in the memory of Wayne Otto, CGCS, that assists superintendents and other turf professionals in need.

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 at the rate of NFL or major-college
 football coaches.**

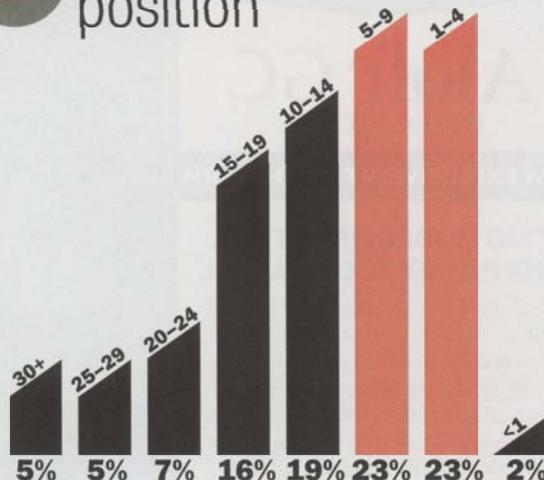
The average superintendent has held his or her **current position for 12.2 years** while only 9 percent have been fired for job performance reasons. Long tenures at a facility aren't anomalies, as 17 percent of superintendents have held their current position for 20 or more years. The survey also suggests most superintendents are satisfied with their respective jobs. If given a career mulligan, **76 percent** said they would still **pursue a job in the golf industry.**

Let's also eliminate another myth held by those outside the industry. Superintendents don't play golf every day. In fact, they are lucky to play once a week.

Less than **one-third of superintendents (27 percent)** play golf once or multiple times per week. Plenty of superintendents are watching their clubs collect dust, as 34 percent indicated they play less than monthly or never.



Years in current position



Have you been **fired** for job performance reasons?

YES 9%
NO 91%

Would you still **pursue a job** in the golf industry

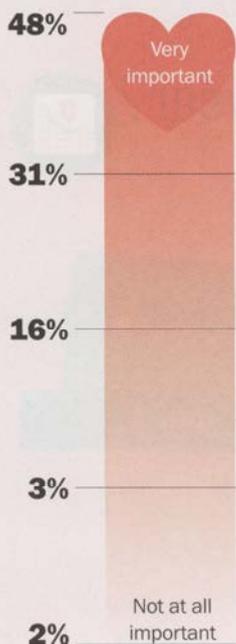
76%

24% NO **YES**

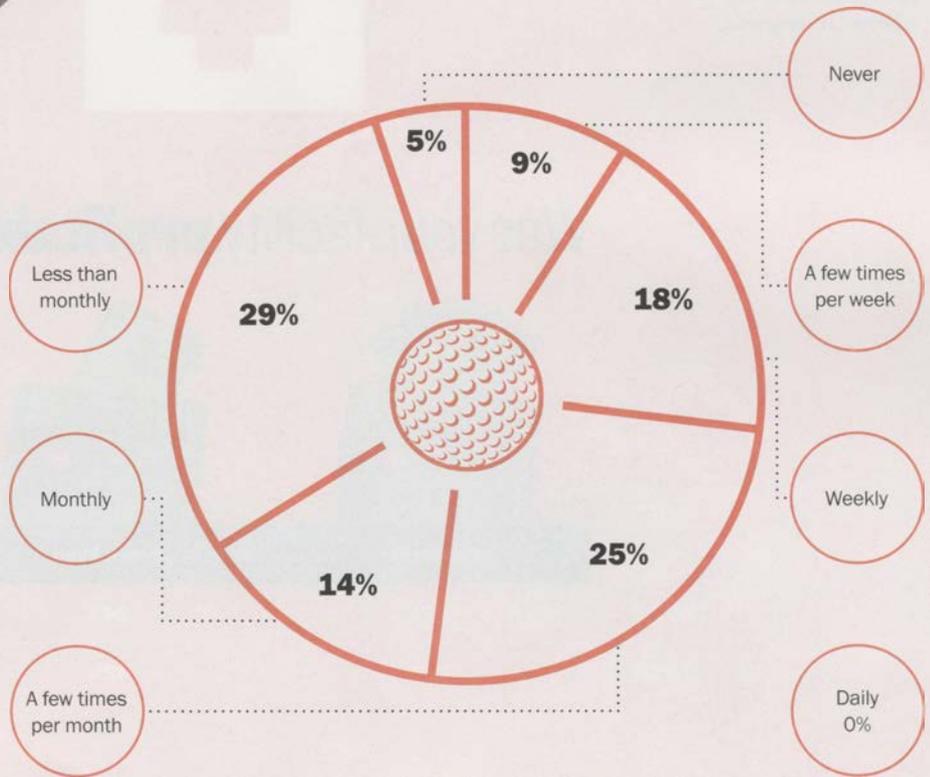
How **satisfied** are you with aspects of your job?



Importance of **passion** for career success



How often do you **play golf**?

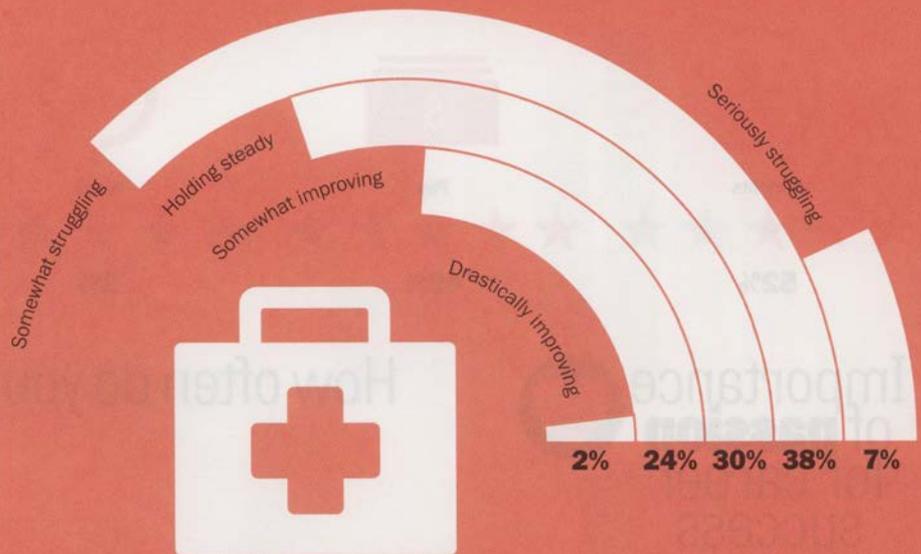


FINANCES

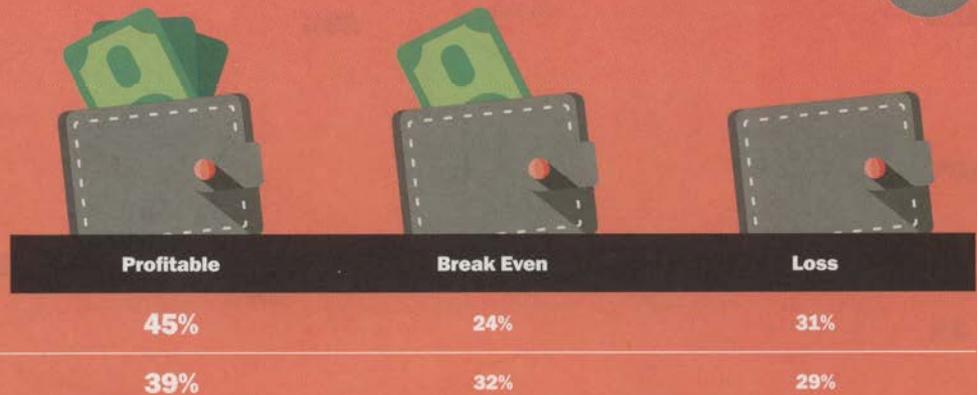
If your facility operated at a loss in 2015, you are in the industry minority.

Sixty-nine percent of superintendents reported their facility either **turned a profit or broke even in 2015**. The number of profitable facilities increased from 39 percent in 2014 to **45 percent in 2015**. Still, superintendents aren't ready to declare the industry has fully recovered from the economic downturn. Forty-five percent of respondents say the industry is "**seriously**" or "**somewhat**" struggling while 26 percent say the industry is "drastically" or "somewhat" improving.

How would you characterize the **financial condition** of the golf industry?



Was your facility **profitable** last year?



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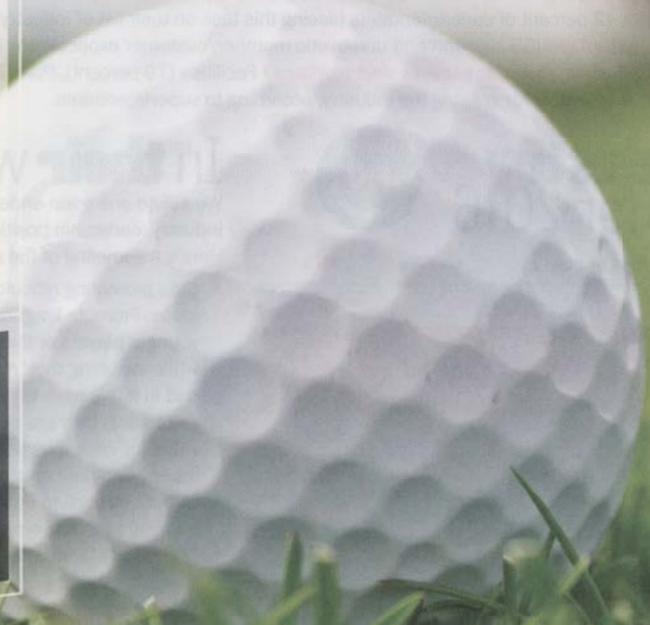
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ATTITUDE

The grassroots of golf don't mirror the highest level of the game, according to superintendents.

While 20-something stars Jordan Spieth, Jason Day and Rory McIlroy occupy the top three spots in the Official World Golf Ranking, the customers many superintendents are seeing at their facilities are old enough to be the trio's parents or grandparents. Three-fourths of superintendents (75 percent) list **attracting younger generations of players as their biggest industry concern** for 2016. Attracting younger workers also represents a conundrum, with 42 percent of superintendents placing this task on their list of industry concerns. Other significant concerns for 2016 include **rising golf course expenses** (55 percent) and unrealistic member/customer expectations (42 percent).

Who's responsible for finding younger players and workers? Facilities (79 percent), PGA (78 percent) and USGA (77 percent) are most responsible for growing the industry, according to superintendents.

Biggest industry concerns for 2016



Attracting younger generations of players	75%
Golf course expenses	55%
Attracting younger generations of workers	42%
Unrealistic member/customer expectations	42%
Cost of play	34%
Saturated market	33%
Pace of play	31%
Regulation	28%
Image	14%
Course closures	13%
Other	7%
None	1%

Other responses include: cost of equipment, developing capital without large initiation fees, player retention, poor management companies, turf surviving winter

In their words

We asked one open-ended question on the survey: If you held an industry leadership position, what would be your first order of business? Here's a sampling of the responses we received.

- Stop promoting ridiculous ideas. Promote leagues for younger players of the game while including their mom or dad in it. We have to make golfers feel they are getting value for what they pay in money and time invested.
- Direct outreach to online booking agents. Some form of code of standards needs to be established by companies using them as we are steadily "devaluing" rounds.
- Try to find out where all those golfers went that were playing in the boom years. Have they returned to play some golf or have life changes eliminated the golf activity from their lives?
- Increasing the profile of the superintendent in the business side of golf courses.
- Trying to get all the golf entities on the same page to promote pace of play and course edict.
- Mandatory documentation of all golf maintenance practices.
- Finding a new way to introduce people to the game of golf. Perhaps by developing entry level facilities where people can be introduced to golf in a way that is neither time consuming nor expensive. The difficulty of the game, the initial cost of the game and the initial time commitment of the game all need to be reduced in order to attract more new players.

Who do you feel is responsible for growing the industry?



79%
Facilities



78%
PGA



77%
USGA



65%
GCSAA



52%
PGA Tour



33%
Corporations



7%
Other*

Other responses include: golfers, GolfNow, high schools, parents, NGCOA, superintendents, GolfNow, We Are Golf

LABOR

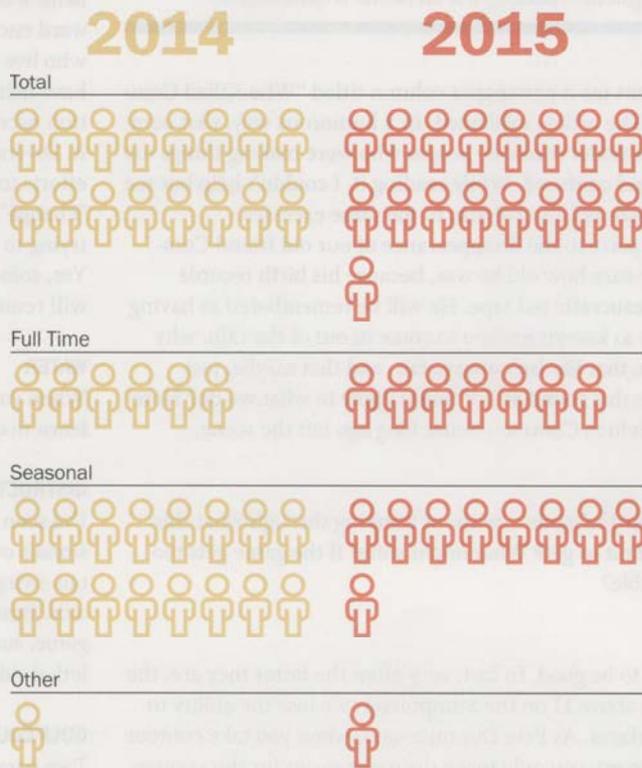
Bigger maintenance budgets aren't helping superintendents solve labor woes.

An improving United States economy makes filling open positions a frustrating task for many superintendents, with 73 percent indicating that filling open positions with qualified candidates is **tougher now** than it was three years ago. Only 3 percent of survey respondents are having an easier time filling positions with qualified candidates.

The toughest positions to fill are the ones comprising the largest percentage of the golf course maintenance labor force: general labor spots. Seventy-three percent of superintendents list those positions as being **difficult to fill with qualified candidates**. A mechanic is the second most difficult position to fill, with 32 percent of superintendents indicating they have experienced finding help in their respective shops.

Conversely, when superintendents have been forced to trim crew sizes in the last three years, general labor spots are the positions most likely to be eliminated. **Fifty-three percent** of respondents have been forced to eliminate at least one crew position in the last three years.

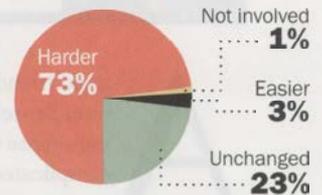
Average size of maintenance staff



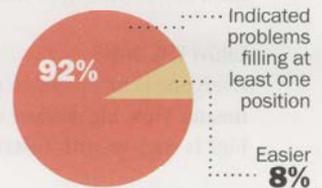
Positions that are difficult to fill with qualified candidates

General labor	73%
Mechanic	32%
Irrigation technician	28%
Spray technician	28%
First assistant	25%
Second assistant	22%

Is it easier or harder finding quality employees now than it was three years ago?



Problems filling positions



Forced to eliminate positions in the last three years



THE DEATH OF COMMON SENSE



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

An old friend sent me a newspaper column titled "Who Killed Common Sense?" The article explained, in a humorous way, that common sense was under threat by people who were making things too complicated and confused. While reading it, I couldn't help but see our own industry as falling victim to the same excesses.

Yes, the golf industry is a party to the disappearance of our old friend Common Sense. We're not really sure how old he was, because his birth records were long ago buried in bureaucratic red tape. He will be remembered as having taught such valuable lessons as knowing when to come in out of the rain, why the early bird gets the worm, that life isn't always fair, and that maybe, just maybe, it was my fault. Does this sound as if it might apply to what we do? Here are a few areas in golf from which Common Sense long ago left the scene.

GROW THE GAME

Everyone is in a panic to grow the game...without thinking through what this means. How big do they want it to get? What might suffer if the game gets too big? Is such growth sustainable?

THE NEED FOR SPEED

Greens don't have to be fast to be good. In fact, very often the faster they are, the worse they are. If greens get above 11 on the Stimpmeter, we lose the ability to build in contour into the surfaces. As Pete Dye once said, when you take contour out of greens and speed them up, you only make the game easier for the average-putting Tour pro and harder for the club player.

GOLF'S INITIATIVES

Does anyone really believe the so-called "alternative games" like Foot Golf, Fling Golf and Hack Golf will attract anyone to good old golf? Try them on your course but please don't think they are a stepping stone to the real thing. How does kicking a soccer ball or chipping into a 15-inch hole give someone that incredible feeling we get playing golf? Do we really want to take the game we love and dumb it down? Do we really want to take a game that has lasted this long because it is a challenge and make it easier? What lures people to golf is its emphasis on skill and the need to practice to get better. We don't want to wake up one day and realize the U.S. Open trophy is being awarded just for showing up.

IS IT BROKEN?

To all of you trying to "fix" golf, answer me one question: How is it broken?

Contrary to popular opinion, the game existed well before 1990. About 300 years before, if not more. It was then and remains a niche sport, a square peg that cannot be fit into the round hole of conformity and convention. I don't believe the game is broken; I'm not so sure about those who want to turn golf into something more mainstream just so they can squeeze a few more bucks out of it. And pardon my political incorrectness, but I don't believe our energy should be put toward encouraging golf among people who live far away from courses and have neither the money nor inclination necessary to play it or work at it. Diversity is great, but some of the efforts to "fix" (which usually means "change") golf are misguided. It's like trying to sell hockey to Floridians: Yes, some will bite, but the numbers will remain small and select.

WATER

When you live in a desert, you must learn to conserve. It's that simple.

INSTRUCTION

I've seen too many teaching professionals overload students with numerous swing thoughts, drills and practice aids. Besides taking the fun out of the game, such over-analysis produces a lethal side effect: slow play.

GOLF COURSE RATING

Two parallel forces have killed Common Sense here: First, those who believe courses need to be rated and can be compared side by side. Second, by the insurance salesmen, doctors, lawyers and retired members of those professions who have played a few courses, paid their way onto a panel, and now consider themselves "experts." Why trust these self-appointed deacons of design? Most of the courses they rattle on about are inaccessible to most of us "regular guys."

(MORAGHAN continues on page 64)

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DISEASE WATCH

2016

By **John Torsiello**

WHAT WILL NAG TURF THIS YEAR? Experts and researchers offer their opinions on tests superintendents could face in 2016.

It is impossible to know exactly what turf issues might raise their ugly heads this year. But being aware of what could happen gives superintendents a heads-up on what to look for on their course's playing surfaces.

"In many areas in the northern United States, the fall was very mild, leading to increased rounds of golf," says Kyle Miller, a senior technical specialist for BASF who covers the northern U.S. "However, this also means that the historical final fungicide applications occurred during a time when temperatures were warm, the turf was growing and product degradation was more

extensive.” He adds the turf may have gone into winter in a more lush state, because temperatures remained somewhat elevated and the turf did not harden off as in most years. This could result in damaged turf next spring.

Summer patch has been a major issue the last two summers in the Mid-Atlantic, Transition Zone and Pacific Northwest, says Dr. Lane Tredway, Syngenta technical manager. Inoculum levels are likely still high, so disease pressure will likely continue to be high when the weather conditions are conducive to disease development.

In the Transition Zone and Southeast, spring dead spot may be a major issue this spring on Bermudagrass and zoysiagrass. “Prolonged warm temperatures this fall were likely conducive to pathogen growth and infection of roots, rhizomes and stolons,” Tredway says. “If this winter is unusually cold in the Southeast, as is predicted, spring dead spot symptoms could be very severe and widespread when the turf greens up in the spring.”

Last year’s weather was sporadic for most of the U.S., says Jenny McMorrow, a turf pathologist with Turf Diagnostic Inc. “For the first time ever, disease issues in my lab were more prevalent in September and October than July and August,” McMorrow says.

“Florida and Texas had periods of excessive rain and overcast conditions,” she adds. “The temperatures in these states are up and down and were not allowing for a normal dormancy. California has extreme drought. Late in the year in New York, the weather today was sunny with 60-degree temperatures, and that is unheard



Unusual weather patterns throughout the year and into this winter could lend itself to higher than normal instances of patch diseases (like *Microdochium* patch pictured here) this spring.

of in December.”

McMorrow reports incidences of spring dead spot much earlier in Florida and Texas, most likely due to the excessive rain and the “roller coaster” temperatures.

“We are grasping for solutions, as Rubigan is no longer on the market,” she says. “Before dormancy, spring dead spot control is important in the fall. However, careful monitoring of the Bermudagrass in the spring as dormancy breaks is just as important.”

She even developed a diagnosis for California called “salt-induced anaerobiosis,” because salt issues were affecting plant water management to the point where the right amount of oxygen was not able to remain in the soil.

“It became clear for many courses in California that unless several flushing rains occurred a decent root system will not be possible for some courses there,” she says. “Irrigating with effluent in this state may be necessary, but agronomically it is a nightmare.”

Rhizoctonia zae also continues to be a “thorn in the side” of

superintendents maintaining Bermudagrass, McMorrow says. “This disease seems to love situations whenever the Bermudagrass is weak,” she adds. “This can be when it is too hot, too cold, too wet, too dry, etc. I expect *Rhizoctonia zae* to continue to wreak havoc on fungicide budgets in 2016.”

WEAK IN THE SPRING

Summer 2015 was a strong disease season due to the amount of rainfall combined with hot, humid weather patterns, says Jim Goodrich, product manager of fungicides, insecticides and plant growth regulators for PBI-Gordon. In the Southeast, summer weather combined with a wet fall to create strong Pythium blight conditions. In addition, heavy precipitation (snow and rain) put superintendents on high alert for a potentially heavy snow mold season over the winter.

“What these conditions can lead to, if not managed properly, is the possibility for weak turf in the spring, which could lead to stress pathogens weakening the turf even more and allowing dollar spot and cool

season brown patch to set in earlier than normal,” he says.

Disease pressure will always vary from region to region, as the factors (rain, humidity, heat) that lead to strong disease pressure are not always present in every region at the same time.

“However, at different times, as the weather present in one region pushes through into adjacent regions, the disease pressure can strengthen and weaken as the humidity and temperatures increase,” Goodrich adds.

“In 2015, Pythium was present in the Midwest on cool-season turf during the summer, but as the rains moved from west to east Pythium reared up in the Southeast and wreaked havoc on warm-season turf during the fall,” Goodrich says. “It doesn’t happen to this extent every year, but it is always a possibility if heavy rains and higher temperatures persist.”

If the El Nino weather patterns hold up, there will be a warmer than normal winter and regular rain will create excellent conditions for pink snow mold and yellow patch or

cool-season brown patch, says Richard Buckley, director of the plant and diagnostic lab and nematode detection service at the Ralph Geiger Turfgrass Center of Rutgers University.

While difficult to predict, superintendents will see more dollar spot and red thread

ful periods, and it seems like these disease are ever increasing as we stretch the limits of playability,” Kerns says. “For example, in the Transition Zone, we saw a major increase in the incidence of summer patch on diagnostic samples we received.” Typically, this

wet spring leading into a hot stressful summer.”

ALIGNING YOUR DEFENSE

Winter weather patterns will say a lot about turf loss this coming spring.

“Whether you’re dealing with annual bluegrass or warm-season grasses, a harsh winter can be everyone’s enemy,” says Dr. John Kaminski, assistant professor of turfgrass science at Penn State University. “After that, it’s really about knowing your property and some of the chronic issues you’ve had in the past and manage those. It’s also important to know some other key diseases that could impact whatever species you’re managing, so that you can be prepared for those diseases that don’t usually hit every year. But when they do, you had better be prepared.”

Superintendents should conduct soil tests and adjust nutrient levels accordingly, as proper nutrition is one of the cornerstones of good agronomic practice.

“My old boss, Dr. Philip Halisky, used to say, ‘Disease is not the cause of poor turf; poor turf is the cause of disease,’” Buckley says. “If you are a good agronomist, then you don’t have to be a pathologist.”

Superintendents with turf species at risk for summer patch (annual bluegrass and Kentucky bluegrass; creeping bentgrass in the Transition Zone) should remember that disease development begins in the spring when soil temperatures reach 65 degrees Fahrenheit, Tredway says. Regular preventive applications beginning at this time are essential to thwart disease. Applications later in the summer, after significant root system damage

has occurred, generally are not very effective.

Monitor and scout for diseases early in the year, so disease damage does not creep up and result in playing catch up from early on, Miller says. “After your third fairway mowing and second greens mowing, your fungicide program for the year should get started,” he adds.

Soil temperatures need to come up before grass starts to break dormancy and grow, Buckley says. “If you are wondering, take a plug and bring it into the shop,” he says. “Put it in a container or plastic bag with a moist paper towel for 24 hours. If the grass is healthy, it will pop and grow. It will be pretty obvious if there is a problem. Maybe then call your local turf diagnostician.”

Superintendents should see healthy, vibrant growth in both the shoots and roots, Kerns says. “Healthy turf is always the first line of defense against any disease,” he says. “Also, start fungicide programs based on soil temperatures not calendars or air temperatures. An early start usually equates to a non-stressful summer.”

Superintendents should evaluate their current control strategies.

“They probably already hit their early-order deadline, so it’s tough to actually save any money at this point,” Kaminski says. “They can, however, read up on the newer chemistries that are available and keep that in their minds moving into the season. Resistance is always a concern and there may be some newer chemistries out there to help in their rotations.” **GCI**

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



Typhula blight (known as gray snow mold) is one of the most common turf diseases. Heavy snow and rain this winter could pave the way for strong disease pressure.

coming out of spring than normal, and perhaps even more anthracnose on greens.

“All of these diseases depend on tired and hungry turfgrass to manifest,” Buckley adds. “Extra stress late in the 2015 season may take its toll and that might show up as disease next spring.”

Disease pressure is dictated by the environmental conditions in a given season, says Dr. Jim Kerns, assistant professor and extension specialist of turfgrass pathology at North Carolina State University. Therefore, many areas of the country may experience wildly different disease pressures depending on what Mother Nature deals out.

“As usual, root diseases are most problematic during stress-

disease when observed on creeping bentgrass is usually isolated to areas with high pH or another cultural oddity. “This summer, however, we saw the disease in numerous areas throughout the Transition Zone,” Kerns adds.

A warm, wet spring could prove problematic because disease activity may occur prior to normal seasons, Kerns says. “Moreover, more fungicides may be needed to protect turf through the season,” he says. A warmer winter could aid with pathogen survival, and that in turn “may lead” to more disease in the spring and summer, “but again it depends on the spring.” He adds, “The worst-case scenario is a warm winter, followed by a warm,



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TALKING THE COLLEGIATE TURF BOWL



John E. Kaminski, Ph.D. is an associate professor, Turfgrass Science, and director of the Golf Course Turfgrass Management Program at Penn State University. You can reach him at kaminski@psu.edu.

The heated competition of the students representing their universities is almost upon us. Who's ready? Who's prepared to battle it out for the win in 2016? Who really cares about this at all?

The Turf Bowl has a long standing tradition of having students from numerous U.S. turfgrass programs battle it out for bragging rights (and now a substantial cash prize). Before I tell you what I like and what I don't like (there's several things) about the annual Turf Bowl Competition, let me set the stage of where I'm coming from.

First, it's easy to criticize something when you're jealous of those at the top. Penn State has always done well in the Turf Bowl, but its stellar performance in 2015 (first, third, ninth and 12th) has actually put me in a position where I can write this without sounding like a jealous professor. I want to make it perfectly clear I'm not taking any credit for the outstanding job our students did last year. I give full credit to Dr. Ben McGraw, who over the course of several months, trained the students. I have, however, been involved in the Turf Bowl for many years and ultimately had to bow out of participating for a number of reasons.

LONG TO TAKE, LONG TO GRADE

In the past, I volunteered alongside faculty to grade the exams. It was a slow and arduous process and all on a deadline to have the results ready by the evening's announcements. You would think it would be an easy situation, but as you pulled turf experts together to evaluate the responses, there would always be differences in opinions as to the correct answers. For me, I remember complaining about the pathology images and how a real diagnosis could not be made based on the image or information given. In any case, it made for a long process.

A LONG REIGN AT THE TOP BRINGS CONTROVERSY

As Iowa State racked up win after win, several professors became upset and some even suggested the group had acquired an unfair advantage. This was one reason I started distancing myself from the event. It was supposed to be fun and competitive – not cut-throat. It certainly wasn't meant to be a faculty competi-

“If you're a student competing in San Diego, then I wish you the best of luck. Study hard and compete hard, but don't lose sight of the opportunities that the GIS has to offer.”

tion. At some point the exam was changed. Some will argue it was to speed up the grading process. Others will contend it was a fresh start so every team would be on a level playing field. I'm guessing it was a combination of both.

COMPETITION GETS INTENSE

I love the competition and the passion each student has to represent his or her university at the national level. In fact, I encourage it. However, I don't believe so much pressure is placed on students that they lose focus of what GIS really is about, and the Turf Bowl is only a small part.

I remember after the results were announced one year, a university's team was reviewing the results of the individual sections of their exam. Recognizing one of their team members did poor on the essay portion, and that this likely cost them a first-place finish, they berated the student until they burst into tears. I wouldn't be surprised if that student is no longer in the industry. Another turning point for my involvement.

AWARDS CEREMONY

I get what sponsorships mean to both GCSAA and to the companies that sponsor events. I can see it from both sides. However, the event where the Turf Bowl winners were announced turned from a meet-and-greet for superintendents and the students to a cluster of people standing at the sponsor's booth. The overall intentions of the event were this time lost in a sea of green.

While Penn State benefited from the financial support in 2015, I still believe this event is about friendly competition and university pride as opposed to a monetary award.

IT'S NOT ALL NEGATIVE

The Turf Bowl is good for many reasons. First and foremost, competing in the student competition is likely what (KAMINSKI continues on page 63)

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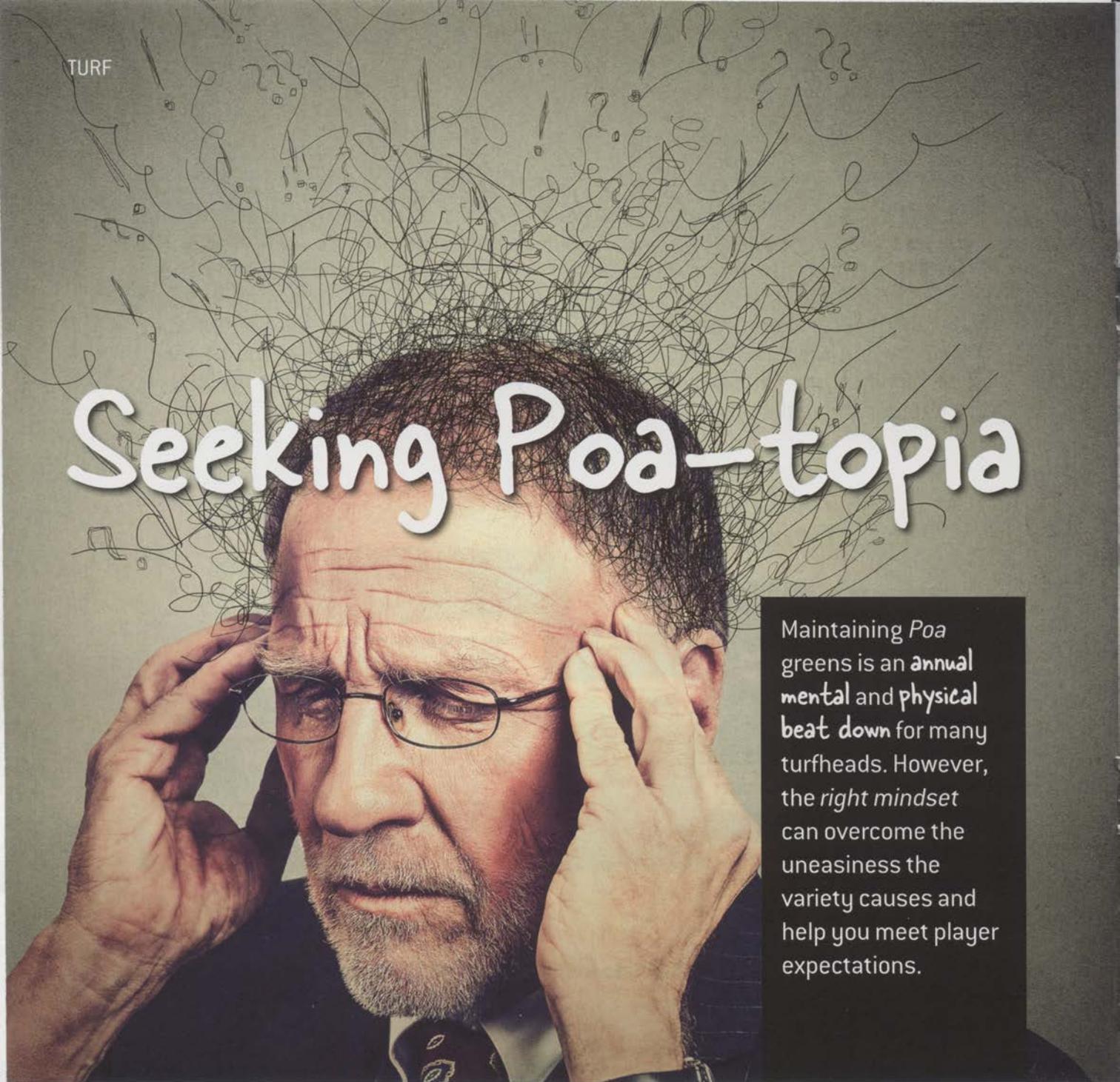
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Seeking Poa-topia

Maintaining *Poa* greens is an **annual mental and physical beat down** for many turfheads. However, the *right mindset* can overcome the uneasiness the variety causes and help you meet player expectations.

By **Guy Cipriano**

The mental side of golf is a mega-business. Books and videos designed to help players shave strokes saturate the market. Tour pros often laud their mental skills coach as often as a swing or short game instructor.

Now consider the mental side of golf course maintenance. How a superintendent and crew handle clutch moments can shape careers. Ever try to keep greens alive, and Mr. and Mrs. Smith from complaining about them in Chicago, Pittsburgh or the Capital Beltway during a sticky August? Unlike the millionaire on TV trying to sink 4-footers, you most likely don't lean on a psychologist who specializes in superintendent behavior when times get tough.

Of all the mentally taxing maintenance moments, managing *Poa annua* greens ranks among the trickiest. No matter what new product or research emerges, the grass variety tests the fortitude of those who work closely with it.

"I guess the way you can visualize it that most people can relate is that managing *Poa annua* is a lot like being a doctor or a nurse in an intensive care unit," says Dan Dinelli, a third-generation

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Poa across the pond



superintendent who manages bentgrass-Poa greens at North Shore Country Club in suburban Chicago. “You are on call constantly. And there are some doctors and nurses that you run into that are in the intensive care ward that thrive at it and they love it. They love that pressure. If not, they don’t last very long. They don’t stick it out.”

Dinelli calls managing *Poa* greens “a love-hate relationship,” and uses words such as “addictive” and “consuming” when trying to get it to perform at a high level. He compares managing *Poa* during extreme weather swings to babysitting. The best babysitters never become complacent.

“You have a bentgrass green if you are in the middle of the summer where stress is fairly high and usage is high and expectations are high, you might be able to go home at 4 o’clock or 3:30,” he says. “With *Poa annua* that happens far less. It

North American superintendents aren’t the only turf managers mentally jarred by *Poa annua*.

European course managers and superintendents are also tested by *Poa* despite a temperate climate throughout most of the continent. The reason? Fewer chemicals designed to help golf courses are approved by the European Union for widespread usage compared to the United States.

Known as annual meadowgrass in Europe, *Poa* started becoming a more accepted putting surface within the last 20 years, according to Kevin Munt, the founder of Kevin Munt golf consultants and former course/links manager at multiple high-level clubs including Royal Dornoch and Wentworth. Still, keeping the variety separated from bentgrass without having a wide selection of chemicals available means restless moments for course managers. “Yes, it drives them mad,” Munt says. “The big issue really is whether we end up with complete chemical bans or greater restrictions on chemical uses on golf courses. Then it’s what the hell do you do with annual meadowgrass?”

demands your attention.”

USGA Green Section agronomist Adam Moeller describes *Poa* as “unforgiving to the point where if you miss a syringe by

about 30 minutes or an hour that can be the difference between that grass dying and surviving.” Big challenges also exist in the winter.

Commitment at the club level is a key to avoiding potentially stressful situations created by *Poa* in Europe. Hiring somebody with links experience, where fescue-bentgrass greens are desired, to manage a parkland golf course with *Poa annua* could seriously damage all parties involved.

“If you are going to manage annual meadowgrass on a parkland golf course, there is no point in having links guys totally committed to growing bent-fescue,” Munt says. “It really needs to be written into the club’s course management policy document. It has become quite a big thing over here. It’s outlined how the club runs through the future and sort of supplies the job description for the course manager. If it states in there they are going to manage annual meadowgrass greens as best as possible, then that’s what you have to do.”

The same thinking can be applied in the U.S. If you haven’t managed widespread *Poa*, you might be doing yourself a personal favor by avoiding jobs with *Poa* greens and lofty putting surface expectations.

Moeller, though, works in the USGA’s Northeast Region, meaning he visits numerous courses that successfully maintain the variety, including past and future U.S. Open sites. Superintendents who endure the grind produced by *Poa* greens display some shared characteristics.

“It definitely takes good communication with their membership, because they know there are ups and downs with the grass, with the seed-heads, with potential winter injury and with just how hard you can push it in the summer,” Moeller says. “It’s communicating to their members and golfers that it can’t be maintained at an ultra-high level the whole season. There are going to be some peaks and valleys.

“Hard-working is probably

Superintendents managing *Poa* greens have a love-hate relationship with the turf because it’s such a challenge to get it to perform at a high level.



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TURF

one of the easiest descriptive words for superintendents that are managing high-quality *Poa* greens," he adds. "Hard-working and well-staffed, because it's not a grass that you can kind of rest easy and rest on your laurels even for a little bit. One superintendent isn't going to be able to manage this grass at a high level on their own. They are going to need a strong support system to make sure it's not going to check out under the tough weather conditions."

And *Poa* just doesn't pester the head superintendent. Few things are as deflating as watching crew members spend entire shifts hand watering and finessing a grass variety with shallow



Fircrest Golf Club is a Pacific Northwest facility with a large percentage of *Poa annua* in its greens. Superintendent John Alexander says being accessible to members helps him manage the grass.

roots while member are trying to play the course, Dinelli says.

John Alexander, the superintendent at Fircrest Golf Club in Fircrest, Wash., has spent his entire career managing *Poa* at Pacific Northwest courses. He

says he's fortunate to be working in the ideal climate for the variety and at a facility with reasonable expectations. But that doesn't mean he's operating in *Poa*-topia. A dry spring and summer in 2015 tested

Alexander, assistant superintendent Ryan Fink and the rest of the Fircrest crew.

"There's no doubt that when you have a summer like that you will be dragging hoses," Alexander says. "And by the

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time September came around, I was more than happy to put my hose down every once in a while. It can be a drag. That's the mental drag of it. Every day, the little bad spots, the little dry spots."

Fostering a team atmosphere helped Alexander handle 2015. Everybody on the Fircrest crew, including Alexander and Fink, hand watered greens. When determining assignments, Alexander says Fink dispersed hand-watering responsibilities.

Making himself visible to the membership during stressful periods also helps Alexander handle the mental side of maintaining *Poa* greens. The more members know about

Poa's challenges, the more they understand what a superintendent and crew experience when it becomes temperamental.

"Just being out there on the course, playing a little bit of golf with the members helps," Alexander says. "Being an old codger, I don't blog and do a lot of that stuff, but I put a lot of thought into my newsletter articles each month. We have bulletin boards in the locker rooms. I try to change out some articles about it. We have 10, 15, 20 percent bent in our *Poa*. That's one of the bigger questions I get, 'What's this grass here that just doesn't blend in perfectly?'"

Demands for firmness repre-

sent one of the biggest changes in *Poa* management, and Alexander says those can be met by believing in your agronomic and irrigations programs. He concedes it would be less stressful to turn up the irrigation system, but hand watering and "liberal" use of wetting agents provide firmer surfaces at Fircrest.

Poa can limit promoting firmness in certain areas, Moeller says, although courses such as Winged Foot, where a greens reconstruction improved the root-zone mixture, provide evidence that *Poa* can play firm. Dinelli views the demands for firmness – which he tries to meet at North Shore

– as part of the evolving mental game involving superintendents, golfers and *Poa annua*.

"I guess we have satisfied the golfers' need with the speed issue and they have moved on to firmness," Dinelli says. "You are always trying to raise the bar in some category. Now there's a lot of pressure to keep things firm and much of firmness relates to how dry the surface is, and that becomes really challenging when you have primarily *Poa annua* in the middle of the summer and the roots are extremely shallow and you are trying to maintain a firm surface. That can be a nightmare. It takes a ton of babysitting." **GCI**

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HOW DO YOU DESIGN A GREEN?



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.

On a recent flight, the guy next to me asked what I did for a living, and upon finding out, started asking questions, including, “So, just how do you design greens?” He figured it would be an easy answer. This got me thinking. As important as green design is to golf, I haven’t ever covered it in this column, perhaps because of complexity. And, way back in time, I actually wrote such a document to explain the basics of the process to new employees. I dug that old document out, and it still mostly applies, with some humorous time-machine quotes – “pull out pencil and tracing paper” and “maximum green slope is 3.33 percent for cup areas.” LOL. I will recreate it here in updated and less technical fashion, hoping to enlighten those who, like my row mate, have asked the same questions.

THE BIG PICTURE

My green designs begin with the big picture – Is it a private, upscale public, resort or municipal course? The varying (assumed) average quality of golfers, rounds played, maintenance budgets create different starting points and limitations. Generally, as expected play levels rise, maintenance issues like microclimate, green size, circulation patterns and speed of play are top priority. With lower play levels and generally higher quality golfers, aim for a more architecturally interesting or challenging course vs. a “golf factory.” In renovations, history might also influence design.

VARIETY

I initially review potential basic designs for all 18 greens, trying to create a general concept that makes each one different. I believe small greens ought to intersperse with larger ones, wide with deep, etc. I also try to vary greens on the same hole type (par 3, long and short par 4, or par 5 holes.) This is one great advantage to plans over “winging it” with field design.

THE APPROACH SHOT

Then, I design the green itself. We consider the lay of the land, the approach shot and even the tee shot strategy, if we didn’t consider it when studying variety.

There are several basic types of approach shot challenges. For playability, most greens need the fairway to connect to the front of the green, because many golfers roll approach shots on to the green. I design most greens with an open front, with a “tucked pin” somewhere on the edges or corners to challenge better players when located there. I call these “Sunday Pin” greens, or if there are two tucked pins, “Weekend Pin” greens.

We presume the superintendent will create a cup rotation system for a balanced

test on a daily basis. Of course, they can be made easier or harder for special occasions.

A minority of greens can or should have other approach shot concepts, including:

- Precision Target
- Multi-Target (two, three or four distinct green areas)
- Unusual Green – Ribbon Green (narrow width or depth); Center Hazard; Reverse Slope; Ultra-Large

I design the approach shot concept considering both the approach shot and the lay of the land. But good players favor an approach shot that maximizes success, considering:

- **Green axis** – Shots mirror green angle - fades fit greens that angle right.
- **Greenside hazards** – Aiming away from them, but curving back is safest
- **Wind**, usually “riding it” by curving shots the same direction as the wind
- **Ground slope** – Hitting fades when their lie has cross downslope right

For as many greens as possible, I try to align those signals to say “fade” or “draw” which sets the shot. However, I have never achieved a course with all 18 greens with axis angled with the wind and lie, because I design to the topography first and foremost. As such, small sites get small greens, topography angling left beget greens angling left, etc. It really doesn’t work well any other way.

I console myself with the fact that wind varies day-to-day and with seasons, good golfers all play differently, and many don’t notice such things. Most sites have a variety of green sites, ranging from slopes that strongly dictate green shapes, angles and sizes, and others flat enough where a green can take on any form, which I use to balance out the green types.

You can see the entire process is both complicated and circular. I need to consider many things at once – pretty hard for the human mind – and often go back to square one in considering just the big picture factors. And, there is much more to consider, as you will see beginning next month. **GCI**

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WHAT LIES BENEATH

WHITE GRUB CONTROL IS KEY TO KEEPING TURF INTACT AND DETERRING ABOVE-GROUND CRITTERS LOOKING TO TREAT YOUR TURF LIKE A BUFFET.



by **Rob Thomas**

White grubs deliver a one-two punch to superintendents fighting to keep their golf courses healthy and thriving. Initial injury to turf occurs from larval feasting on the roots, which results in infested

areas first turning yellow, then brown, and finally dying. It's the secondary issue, however, that leads to the most damage.

The grubs' predators are much more destructive than the larvae, itself, says Rob Golembiewski of the Bayer Green Solutions Team.

White grubs are larvae of

several beetle species including May-June beetles, green June beetles, masked and European chafer, oriental beetles, Japanese beetles, Asiatic garden beetles and atenius beetles. They are major pests of higher-cut turf (fairways and roughs) throughout much of the United States, Golembiewski adds,

with the greatest occurrence in the Northeast, Mid-Atlantic and Midwest. The May-June beetle will have a 2- or 3-year life cycle depending on species, while other significant species have a 1-year life cycle.

"Egg laying can occur at various times during the season depending on species and re-

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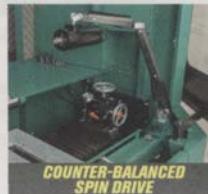
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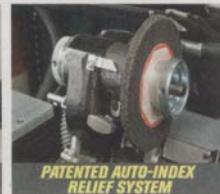
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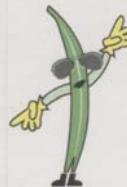
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Grub ID



Once a superintendent is aware of a grub issue, identifying which white grub species are present is paramount in remedying the situation.

The adult beetle stage of white grubs differ in size, color markings and life cycle, while the larval stage is similar in appearance and can be characterized by the C-shaped position when found in the soil-

thatch interface area of the turf, Rob Golembiewski of the Bayer Green Solutions Team says. To identify grub larvae, he recommends using a 10x or 20x hand lens and examine the spines on the underside of the abdomen tip, called the raster. The raster pattern is different for each grub species and is the most common method of identification."

gion of the country, but usually begins in late June or early July and continues for four to six weeks," he says. "In most cases, adult emergence occurs in mid-summer, often after significant rainfall or irrigation, followed by mating and egg laying. The eggs hatch and the small larvae begin feeding on roots with molting from first to second instar occurring in a few weeks. Most of the feeding damage is done by the comparatively large third instar larvae, and it is this stage that causes visible turf damage."

Overwintering occurs in this third instar stage with larvae moving downward during late October or November into the soil profile for protection from cold weather. The following spring, the larvae move up to the soil-thatch interface to feed and replenish food reserves lost during the winter before moving back down and transforming into the pupal stage. "A one-year cycle will be completed with beetles emerging from this pupal stage a short time later," Golembiewski says.

And the damage they do can be extensive. When grub populations are heavy, areas of turf are easily lifted from the soil. "Turf damage from

white grubs is much less common compared to the damage that results from animals feeding on the white grubs," Golembiewski says. "Moles, raccoons, skunks and turkeys are the most common animals that destroy turf when feeding on white grubs. Turf can be severely damaged by animal foraging and usually results in

reseeding or resodding."

White grubs thrive in environments with adequate soil moisture and food. Golf courses provide plenty of irrigated organic matter in the soil profile for both larval development and life cycle completion, says Matthew Giese, field technical manager for Syngenta Turf & Landscape.

The term "white grubs" encompasses a significant number of beetle species that affect desirable turf species on any given golf course. "From the largest white grub (green June beetle) to the smallest (black turfgrass atenius or billbug) and everything in between, each insect has different preferences in terms of what their

5 Tips

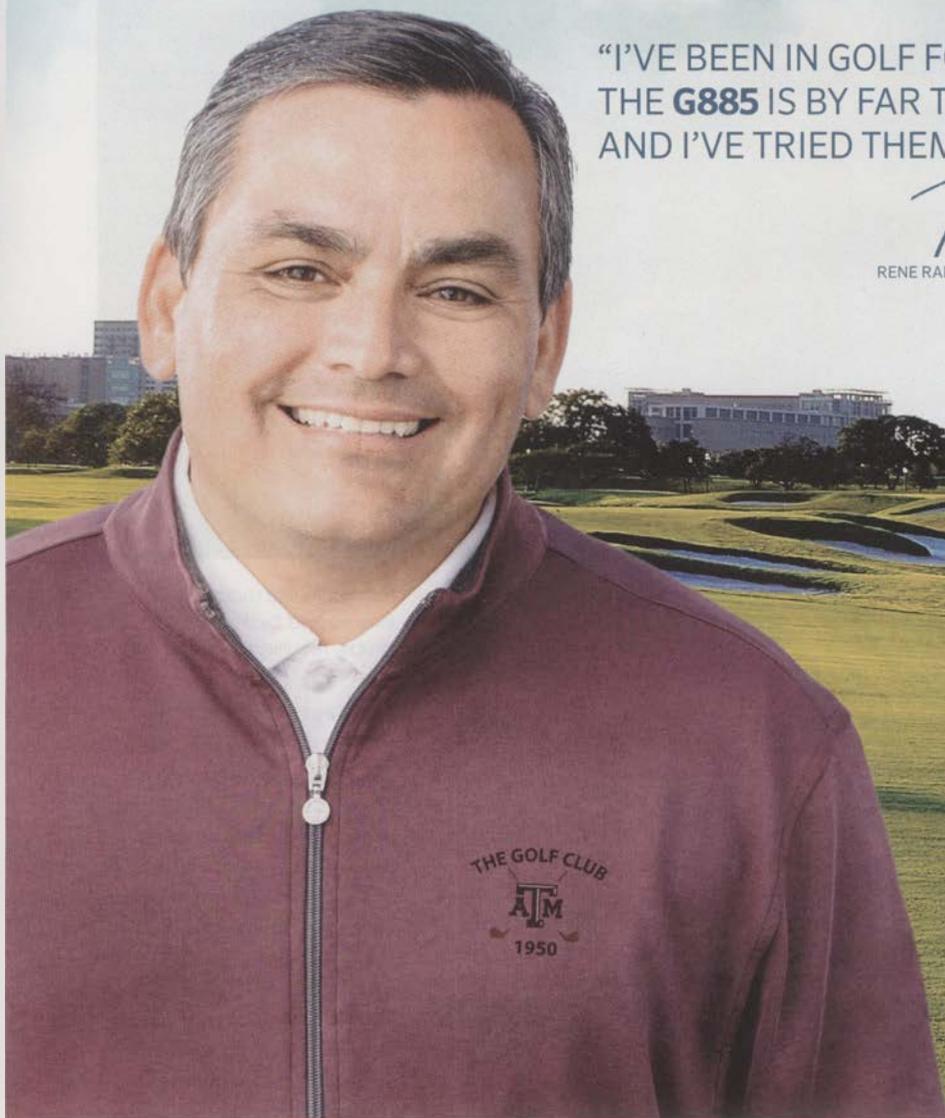
While there really are no "new" strategies when it comes to grub management, Rob Golembiewski of the Bayer Green Solutions Team says there are some best management practices that should be followed, including:

1	2	3	4	5
Manage the thatch layer ensuring there is no more than 0.5-0.75 inch of thatch present;	Under dry conditions where thatch is present, irrigate the area to be treated prior to an insecticide application. Wetting the thatch/soil interface encourages the larvae to move closer to the surface;	Irrigate immediately after the insecticide application. If a complete irrigation cycle is not possible, then syringe immediately and complete irrigation later in the day. No additional irrigation is required if sufficient rainfall to thoroughly wet the thatch and move the product into the soil occurs after application;	Do not apply an insecticide to turfgrass soils that are waterlogged or saturated and will not accept irrigation. Adequate distribution of the active ingredient cannot be achieved under these conditions. The treated turf must be in such a condition that the irrigation or rainfall will penetrate vertically into the soil profile; and	If the area to be treated experienced high grub populations the previous year, apply the highest label rate of the insecticide since adult beetles tend to return to the same area to lay eggs year after year.

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favorable environment might be for cover (height of cut) and egg laying requirements (turf species)," Giese says.

Turfgrass areas with higher thatch levels are generally preferred, as this provides a significant food source for larval growth, Giese says.

"While it is not always the case, golf course greens tend to have less thatch and therefore, to a lesser degree, lower incidences of white grub infestation," he adds. "Roughs, fairways, tees and approaches are common desirable areas where adult beetles will mate and lay eggs for optimal larval development and eventually pupation into adult beetles."

However, Giese reiterates grubs will infest greens. For example, the green June beetle grub – the largest grub species infecting turf – can be found in greens and cause a fair amount of surface damage.

"The bottom line is that if the adult beetle's basic environmental preferences are met, it's possible white grubs could be found almost anywhere on the golf course," he says. "In most cases, the damage is root loss and the inability of the plant to absorb moisture and nutrients for its survival. This type of damage typically results in the visible plant tissues turning yellow or necrotic, and can be mistaken for disease symptoms or even drought stress."

If the turfgrass is growing vigorously, then it may withstand root system damage and no visible symptoms will be apparent, Giese says. In this latter scenario, where no surface symptoms are visible, indirect damage may occur – critters digging for a meal.

White grubs management strategies on the golf course



Get Control

What have been the most effective preventive and curative insecticides for grub control?

Preventive Insecticides*

Chemical Name	Brand Name
Chloranthaniliprole	Acelepryn
Clothianidin	Arena
Imidacloprid	Merit
Thiamethoxam	Meridian

*Products listed for preventive control have long soil residual and are meant to be applied before a potential grub problem develops.

Curative Insecticide

Chemical Name	Brand Name
Trichlorfon	Dylox

are unique from other type of pests a superintendent encounters, Giese says. "Disease and weed-control management will typically require multiple applications for control of these pests," he says. "Most basic grubs can be controlled with a single well-timed application. The exception here might be billbugs and annual bluegrass weevils, both of which have multiple life cycles that may require more than just a single insecticide application. The key is well-timed."

Different preventive insecticides have different application timings. Not following the specific recommendations will

result in less-than-desired outcomes. Giese says. However, he adds preventive applications are the most effective for season-long control.

The introduction of the neonicotinoids (Meridian, Merit, etc ...) for grub control was seemingly a silver bullet. Make one application prior to egg hatch typically in June or July and expect season-long control.

"If grub breakthrough does occur late in the season, some contact type insecticides are useful, albeit short lived, to suppress white grub feeding," Giese says. "Within the last five years, the introduction of the anthranilic diamide

Predators like raccoons, skunks and birds feed on grubs, resulting in turf damage.

(Acelepryn) chemistry has provided longer soil residual than the neonicotinoids and a broader spectrum (cutworms, sod webworms, billbugs) of pests found in turfgrass. In addition, this chemistry characterizes a friendlier environmental profile, especially around beneficials and pollinators, and as public and regulatory pressures mount for increased pollinator safety and habitat, it offers an attractive option for preventive white grub control."

And, unlike other pests, resistance hasn't been an issue.

"There has never been a confirmed report of neonicotinoid resistance amongst any grub species in turf," Golembiewski says. "Reduced control is most likely the result of excessive thatch, low use rates, improper application timing, insufficient watering in of applications and/or poor environmental conditions. The impact of thatch on insecticide performance should not be underestimated. A turf stand with thatch layers of 0.75-1 inch may prevent 50-80 percent of any insecticide from reaching the soil." **GC1**



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THE FOUR-YEAR TURF DEGREE: THE BIG PICTURE



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

Stories about the cost of higher education, the value of a degree and over-qualified unemployed graduates headline the news. In fact, this topic is more prevalent than stories about golf's decline and downturn. So it doesn't take much to question the future of the four-year turf degree.

Statistics show earning a degree is worth the cost. In fact, some argue it has never been more valuable, and U.S. Department of Labor data on pay gaps illustrates this point. The Economic Policy Institute reported that in 2013 those with a four-year degree earned 98 percent more than people without. Also, in April 2013, the unemployment rate for individuals 25-34 years old who held a four-year degree was only 3 percent.

To put a value on it, one MIT economist calculated not having a degree would cost a person about \$500,000 over a lifetime, and this figure is rising. In the big picture, completing an undergraduate degree will result in more earnings, higher employment rates, greater opportunities and more success. Given the trend, you have to wonder how long it will be before a four-year degree won't be enough and circumstances will put a lot more value on a master's degree.

Statistics from a 2015 GCSAA compensation/benefits report support the importance of a degree in golf turf management. The pay progression, from lowest to highest considering all superintendents (regardless of classification or certification) is: high school to some college to a one-year certificate to associate's degree to two-year certificate to bachelor's degree to master's degree. The pay differential between high school and bachelor's degree amounted to almost \$25,000 per year.

But there are major exceptions that are well known among my generation. Successful superintendents without a college degree were common, and they managed some of our best golf courses. They were smart and took advantage of other avenues of education – seminars, conferences, program speakers and a hundred other ways. All had generous doses of common sense, huge work ethics and a love for the profession.

At our land grant University of Wisconsin in Madison, tuition, books, room/board, miscellaneous and travel cost a student an average of \$24,735 per year. These costs have impacted enrollment in our four-year turf degree program (we do not offer a two-year degree). I suspect the story is similar all around the country. It is also difficult to gain acceptance – high class ranking, many activities and high SAT/ACT scores thin out the list of potential students. If you can manage the \$100,000 for a four-year degree, have the credentials to gain acceptance and the intellect to graduate, you will be eligible for a job as a spray tech or a second assistant. Or, if you are really lucky, maybe an assistant superintendent

job. Pay? Somewhere between not very good and lousy. Compare that to the student who earned a degree in engineering or business, and kids wonder why would you select golf course management for a major? It makes no sense economically.

As a result, we see a substantial decline in four-year degree programs.

I hate it. I'm a product of the Wisconsin program, albeit a long time ago. I had 100 four-year degree students work for me over my career, and nearly everyone has had a successful career in golf. But I understand the hesitancy undergrads have. Nonetheless, I tend to be more optimistic. We still need four-year degree grads. The best of them will fill superintendent jobs and we certainly want that. To argue otherwise is to argue against education. Our grad schools benefit from having students attend with turf background rather than without. We surely don't want to see a weak graduate school pool.

I see my own chapter and our Wisconsin Turfgrass Association stepping up to increase scholarship help. Maybe we will all be able to do a little bit more.

A four-year degree's value is less obvious. It offers an increased sense of accomplishment, higher job satisfaction, more confidence, and increase eligibility for other jobs. Hopefully, a degree sharpens one's ability to think critically, to question practices and procedures, and allow for growth and development.

Golf has stalled and new jobs are few. That could change as aging superintendents retire and vacancies are filled. A new equilibrium will be reached – the new norm and four-year degrees can fill their new place. In fact, it may end up resembling the program when I was an undergrad 50 years ago.

Certainly, a four-year degree is not the only path to a successful career in golf course management. But I still think it is the best path. **GC**

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Get to know the San Diego Scene

GCI contributor and SoCal denizen of "America's Finest City" gives an insider's look at what not to miss during your stay for the 2016 Golf Industry Show.

By Jim Dunlap

A

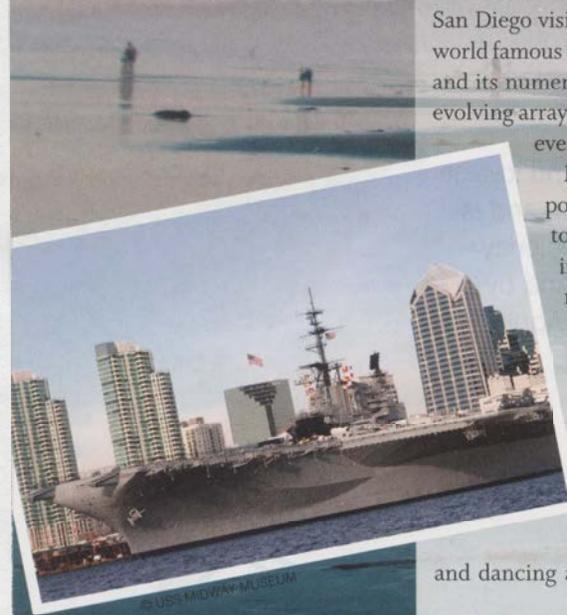
ll in all, what the locals proudly refer to as "America's Finest City" should provide relief from a long day of meetings or pounding the show floor.

Attendees at the 2016 Golf Industry Show in San Diego Feb. 6-11 may be greeted by the city's typical year-round meteorological menu of sunshine and 70 degrees, given the El Nino forecasts for what passes for winter in these parts, but rain or shine, there are plenty of things to do away from the downtown Convention Center's show floor. Even first-time San Diego visitors are no doubt aware of city landmarks like the world famous San Diego Zoo, SeaWorld, Torrey Pines Golf Course and its numerous bay and ocean beaches, but downtown's ever-evolving array of restaurants, bars, clubs and attractions will offer even frequent visitors some new options.

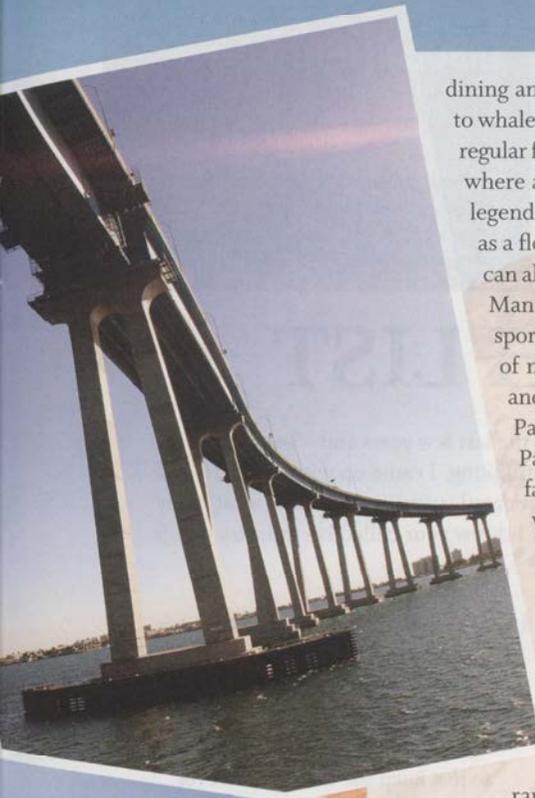
More about the limitless array of dining and imbibing possibilities later, but for those who have some time to spare, there are plenty of things to explore. Several interesting options are within walking distance of many downtown hotels, including Seaport Village and its collection of quaint shops and restaurants on San Diego Harbor. Equally close by, a brisk walk, short cab ride or even a pedi-cab ride away, are the Flagship Cruises and Hornblower bay cruise fleets which offer close-up looks at the Coronado Bridge, the U.S. Navy fleet at North Island and panoramic views of San Diego's downtown skyline. They also feature a dinner cruise with music and dancing and a Sunday brunch cruise combining excellent



PHOTO: JANE DRYDEN, SANDIEGO.ORG



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dining and beverage service as you sail the calm bay waters, in addition to whale watching excursions on the ocean off San Diego. There are also regular ferry rides from downtown San Diego across the bay to Coronado, where a trip to the famed Hotel Del Coronado is a must. Nearby, the legendary World War II aircraft carrier, the USS Midway, is docked as a floating museum open for public tours. History and culture buffs can also wander through nearby Balboa Park, home to the Museum of Man, the San Diego Hall of Champions with its tributes to San Diego sports icons including what is likely the world's biggest collection of native son Ted Williams' memorabilia, the Old Globe Theater, and a number of other art and historical museums. Although the Padres won't be in residence in February, their beautiful Petco Park is across the street from the convention center. For shopping fans, Horton Plaza is a bonanza of chain and local specialty stores within walking distance from hotels and the convention center.

For a complete list of dining, drinking and clubbing alternatives available within walking distance or a 5-10 minute cab ride from the convention center, we would need considerably more editorial space than this. Suffice it to say, no matter your taste or your budget there are plenty of options to choose from. The Gaslamp District begins directly across the street from the convention center and encompasses a 16-square block area packed with, among other things, more than 70 restaurants,

ranging from fine dining to fast food and everything in between. Hotel concierges will undoubtedly be able to provide visitors with some nearby recommendations for any taste, but several friends

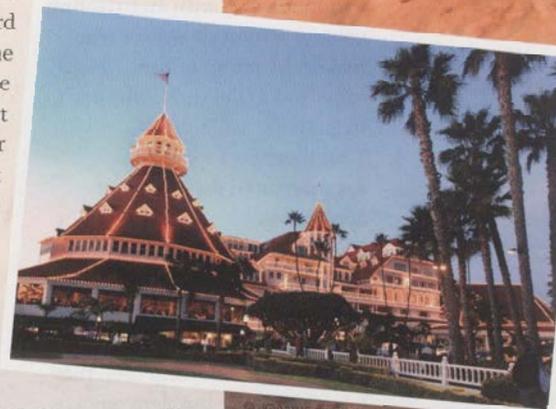
a good deal more hip than I have suggested some that may or may not be on the list of standard fare. Some are The Shout House, The Field, The Tippy Crow, a popular wine bar known as Vin De Syrah, or Puesto at The Headquarters in Seaport Village, reportedly one of the city's top stops for tacos and other Mexican delights. If you're a craft beer fan, San Diego is the place for you. Home to the Stone Brewing Company and many others, San Diego is rated the No. 1 craft beer city in the

U.S. by numerous publications. Most downtown venues offer a good selection, including The Quad Alehouse, The Yard House and Downtown Johnny Brown's, all in the Gaslamp.

While not part of the Gaslamp, Little Italy is only a few blocks away, and has its own array of both landmark favorite eateries and new in-crowd favorites. Some of the newer establishments are Kettner Exchange (shockingly located on Kettner Avenue), Bencotto Italian Kitchen, Pappalecco for gelato, and the slightly tonier Ironside Fish and Oyster.

Another enclave is Old Town, minutes from the airport and only a short cab or trolley ride from downtown. In addition to numerous historical displays and exhibits highlighting the city's Hispanic roots, there are, not surprisingly, some locally renowned Mexican restaurants including Old Town Mexican Cafe (the carnitas are muy bien), Casa Guadalajara and Coyote Cafe. If you're a fan of margaritas and mariachis serenading you while you sample them, you'll enjoy the visit. **GCI**

Jim Dunlap is a writer based in Encinitas, Calif., and is a frequent GCI contributor.



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Brian Vinchesi, the 2009 EPA WaterSense Irrigation Partner of the Year, is president of Irrigation Consulting Inc., a golf course irrigation design and consulting firm headquartered in Pepperell, Mass., that designs irrigation systems throughout the world. He can be reached at bvinchesi@irrigationconsulting.com or 978/433-8972.

DISCLAIMER: This wish list is that of an opinionated irrigation geek and most likely other factors should have been considered, but what the hell. If I threw your collective industry group under a bus, my apologies in advance.

A DREAMER'S WISH LIST

With the start of a new year, like many of you, I reflected back on the last few years and – because it's all I know – irrigation specifically. After much reflection and overthinking, I came up with my 2016 golf irrigation wish list. Disclaimer: This wish list is that of an opinionated irrigation geek and most likely other factors should have been considered, but what the hell. If I threw your collective industry group under a bus, my apologies in advance. Here is my list:

1. That contractors actually read the irrigation specifications and look at the details before and during installation of the system.
2. That sales people realize their product is not always the best out there and to not make believe it is when it isn't.
3. That a pump station communicates with an irrigation control system no matter who makes the pump station – many other industries do it, why can't irrigation?
4. That there be a sprinkler manufactured for every golf application.
5. That products actually do what they are supposed to.
6. When product problems occur, first the manufacturer admits there is a problem and then they take care of the problem quickly.
7. That a flow meter reads the correct flow.
8. That restoring turf to grade after trenching means the same grade it was originally trenched from.
9. That compacting a trench actually keeps it from settling.
10. That a valve box be installed so you can actually get to and service the valve through it.
11. That a controller be wired so you can understand how it was wired.
12. That the central control pipe hydraulic database actually include more than just the flow at the pump station.
13. That someone actually measures the resistance to ground of the grounding grids.
14. That at GIS the new products are displayed so you can easily see them instead of being hidden away in a cubicle that no one can get to without a prior appointment, photo ID and passing through a metal detector.
15. That a sales person actually listens to the question before giving you the wrong answer.
16. That when the contract says "the contractor cannot use any of the course's equipment," that means the contractor should not ask/try to use any of the course's equipment.
17. That wire connectors be waterproof.
18. That a swing joint be installed at a positive angle and not level or at a negative angle from the pipe.
19. That thrust blocks be installed against the fitting and not just to just keep the fitting from ever being seen again.
20. When turning a pipe more than 20 degrees, that a fitting be used.
21. That a controller be wired in a sequence that makes sense to someone, preferably the golf course superintendent.
22. That people understand electrical tape is not waterproof.
23. That PVC primer is necessary.
24. That HDPE pipe needs to have the proper pressure rating and the proper fittings to go along with that pressure rating.
25. That there can never be enough isolation.
26. That quick couplers always be installed so the key can be inserted in them.

I guess I am just a dreamer, but I guy can hope... miracles do happen. GCI



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"JUST" A PENETRANT.



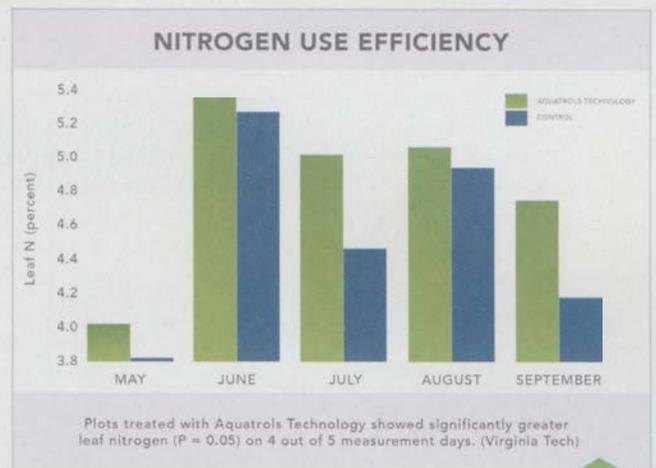
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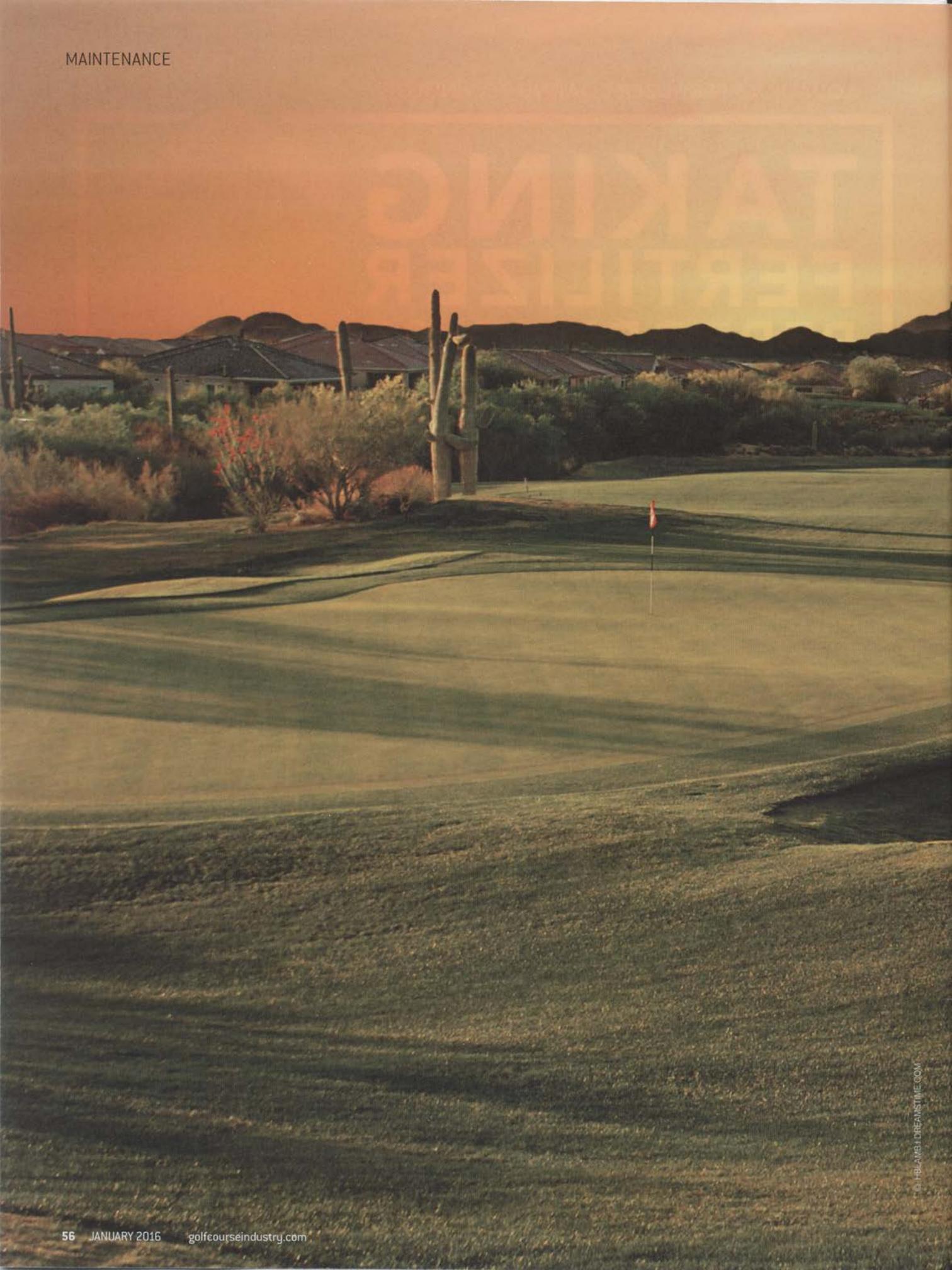
- Increases nitrogen use efficiency
- Increases water use efficiency
- Reduces runoff and nitrate leaching
- Improves water infiltration
- Improves overall fertilizer performance



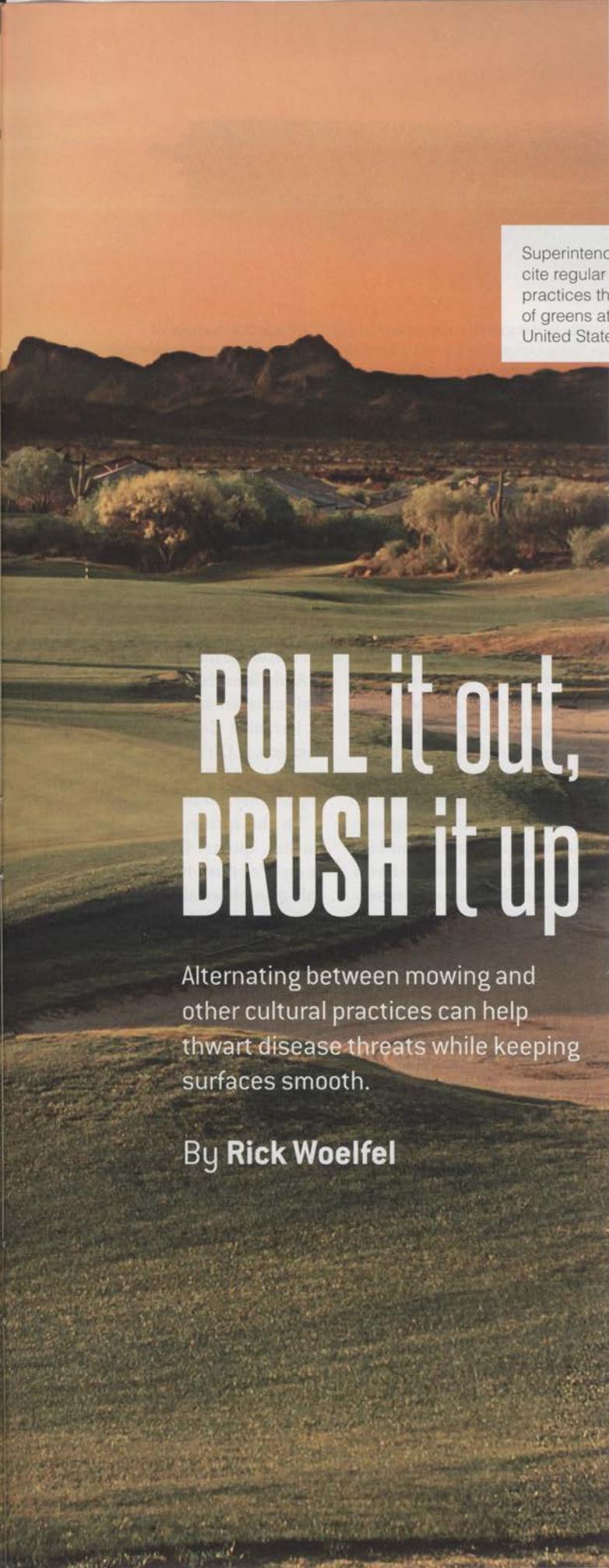
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Superintendents and university researchers cite regular rolling and brushing as cultural practices that have improved the quality of greens at golf facilities throughout the United States.

ROLL it out, BRUSH it up

Alternating between mowing and other cultural practices can help thwart disease threats while keeping surfaces smooth.

By **Rick Woelfel**

Golf course maintenance requires striking a fine balance. The superintendent must ward off disease threats and minimize turf stress while at the same time providing playing conditions that meet member/customer expectations. Superintendents excel as stewards of the environment, and in today's economic climate they must be stewards of their budgets, as well. As a result, turf professionals are crafting new solutions to turf maintenance issues.

One of those solutions involves rolling greens, as well as cutting them, as a way to mitigate disease pressure, particularly dollar spot.

As often happens with great ideas, the rolling greens concept emerged more or less by accident. Thomas Green is a Ph.D. student at Michigan State University working under Dr. Thomas Nikolai, a renowned plant and soil science specialist. Nikolai noticed the impact of rolling green surfaces some two decades ago.

"He was doing a dynamic ball-roll study on putting greens," Green says. "He noticed that in areas where balls rolled across the greens there was less dollar spot. So as part of his dissertation involved seeing if rolling had a direct effect on dollar spot

suppression."

Nikolai found increased rolling frequency did in fact reduce dollar spot issues on putting surfaces and the practice has become more common in the years since.

Substituting rolling for mowing on occasion reduces the stress on putting surfaces, says The Ohio State University's Dr. Karl Danneberger. It is a popular alternative, particularly in warm, humid conditions.

"Increasingly, you'll see people [rolling] during the summer when the grass kind of slows down," Danneberger says, "and maybe cut back on the number of mowings and just roll, especially when you see it in combination with growth regulators. That helps relieve stress if you're not mowing every day and you maintain the desired quality for the golfer. [Rolling] can help reduce the number of mowings especially during a stress period."

In 2011, a team at Michigan State, which included Green, took the next step by examining the effects of rolling on fairways. "In the beginning of the summer of 2011, we added rolling in combination with sand top-dressing," Green says. "Over a four-year period, we built up an inch-and-a-half of sand on top of the native soil. About two years into the study we

decided to add a fungicide treatment. We used Boscalid (trade name: Emerald).”

The study found the combination of rolling and topdressing was effective in controlling dollar spot, although the addition of the fungicide had no appreciable impact.

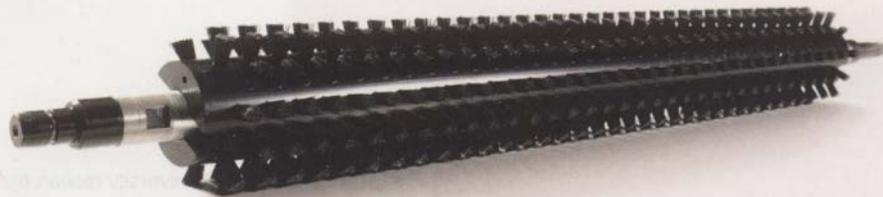
Green points out that relatively few facilities have the resources to roll their fairways on a regular basis. However, one that does is historic Merion Golf Club in Ardmore, Pa. Matt Shaffer and his team tend to 36 holes, the championship East Course and the formidable West Course.

Shaffer, who recently finished his 13th season as the club’s director of golf course operations, alternates between rolling and mowing fairways. Since he started rolling he’s had significantly fewer dollar spot issues. “Our dollar spot problems are diminished by 90 percent if we roll,” Shaffer says.

Turf issues aside, rolling offers economic benefits, as well. “When you roll, it takes two guys,” Shaffer says. “When you cut, it takes no less than four (including one worker who cleans up the grass clippings). So there’s a labor savings there, as well.”

Brushing is another tool a superintendent has at their disposal. Green notes Michigan State began a brushing study in 2015 and says using a system of brushes in conjunction or as a supplement to mowing is effective against disease threats.

“The idea is to decrease the amount of organic matter,” he says. “If you brush and then come in and mow, you’re just removing all that organic matter. Some people claim that excess organic matter in the thatch layer exacerbates



Brushing has developed into another tool superintendents are using to reduce the number of times they mow greens. Michigan State University started a brushing study in 2015 and researcher Thomas Green says using a system of brushes is effective against disease threats.

disease.”

Brushing has been around for some time, but it has become increasingly popular in recent years as mowing heights have gotten lower and green speeds have gotten faster.

Disease issues aside, a brushing system offers a number of advantages. The brushes lift grass blades into a vertical position, thus allowing for a slightly raised cutting height without sacrificing the speed today’s golfers crave. The end result is a smooth and uniform surface. A brush system is less problematic for the turf than vertical mowing and the brushes also remove decomposing organic materials from the putting surface.

If a superintendent decides to brush his greens to supplement his mowing efforts, he must choose the set of brushes that will work best in his particular circumstances. Toro recommends different types of brushes for varying climates, varieties of turfgrasses and course conditions.

In cooler climates, where bentgrass is prevalent, soft bristles are recommended for use early in the season and during the summer heat and humidity. During peak growth periods, in the spring or late summer, a stiffer brush is recommended to reduce thatch buildup.

In warmer climates, where Bermudagrass and zoysiagrass are common, stiff brushes are

suggested but softer brushes are highly recommended for use during periods of slow growth. It should be noted that the above recommendations are general in nature. As is always the case in the turf industry, every golf facility is its own unique entity.

But some guidelines are more or less universal. If a superintendent is topdressing his greens as well as brushing them, he or she should refrain from using rotating brushes on the putting surfaces for two or three days after applying topdressing sand. And all brushes, soft or stiff, must be used with care. Brushing too aggressively results in turf damage so superintendents who choose to utilize this practice are advised to take things easy at first. The height of the brushes must be calculated carefully. The thickness of the canopy is an important factor. For a thick canopy, Toro recommends starting at a height equal to the mowing height, then gradually lowering it after a week or two as the turf on the putting surface adapts to the brushing process. A gauge should be used set the height.

Green recalls working with one superintendent who, over the course of a three-decade career, cared for his greens primarily through a combination of brushing and topdressing — without core aerifying — and still gave his golfers quality putting surfaces.

This approach might best be described as uncommon but superintendents are becoming increasingly comfortable with a minimalist approach to aerification. The idea is to disturb the surface layer of soil as little as possible while still eliminating thatch and organic material to combat the threat of disease.

Andy Schuckers is the general manager/ superintendent at Paramus Golf Course in Paramus, N.J. It’s a public facility so it’s vital that aerification impacts play as little as possible.

“In the spring, we do the smaller, quarter-inch tines,” he says, “on three-inch squares, only going down about two- or two-and-a-half (inches). We bought a deep-tine machine last year. We actually have deep tined six times (through early December 2015).” he says. “We put on a quarter-inch tine; that goes every three square inches and that goes about nine inches deep. We do that, we roll right on top of it and it isn’t a day; worst-case scenario it takes two days before you can’t tell we did it.”

Nearly three decades ago Toro, with the assistance of experts at Michigan State, developed the Hydroject, which punched holes in the soil with jets of water. In 1998, DryJet entered the market with technology that supplemented the water with injections of sand.

Today, Toro features the Pro (BRUSH continues on page 63)



The research plots at Rutgers University have become a frequent testing spot for new bentgrass cultivars.

run with additional fungicide applications. You could probably pay for the cost of the seed with one application or perhaps two of a fungicide on your golf course. So it really pays to pay the higher price for a better variety and in the long run it will pay you back with less input.”

Bonos, a Rutgers assistant professor since 2001, recommends superintendents start planning two or three years out before switching to a new or different strain of turfgrass. She also advises testing a new strain in a nursery before committing to installing it on the golf course. Bonos cites today's modern strains of bentgrass for their resistance to disease, specifically dollar spot.

“When I first started working on this, all of the varieties that we looked at were susceptible (to dollar spot),” she says. “There was nothing that was resistant completely; there really is still nothing that is completely resistant but we really have made dramatic improvements, to the point where there are varieties that can be sprayed with almost 60 to 70 percent less fungicide applications than the standard older varieties that are more susceptible. So I think we are making pretty good strides in that area.”

Bonos says today's modern strains of turfgrass stand up against other diseases as well, such as brown patch. “Brown patch is interesting,” she says, “because it doesn't necessarily kill the grass. It looks bad for about a month or so but it doesn't kill the grass like dollar spot will. And dollar spot is much more prevalent and longer lasting through the spring, summer and fall. Brown patch is really a problem only in the

Getting the most out of the new stuff

A Rutgers University researcher says planning ahead, willingness to make a bigger upfront investment can maximize benefits offered by modern bentgrass cultivars.

By Rick Woelfel

In her nearly two decades at Rutgers University, Dr. Stacy Bonos has had a direct hand in the evolution of turfgrass science, specifically on the development of new cultivars of bentgrass.

Thanks in part to her work, superintendents looking to convert their facilities to bentgrass or regrass with a state-of-the-art strain have an abundance of varieties to choose from. Presently there are perhaps a dozen new cultivars of bentgrass available for use on greens and half that number available for fairways.

Speaking at the recent New Jersey Turfgrass Association Green Expo, Bonos noted that superintendents must consider a number of factors when choosing a strain of turf for their facility. Climate, soil conditions, topography and disease susceptibility all factor into the mix. Cost, of course, is an important factor. But Bonos says a bigger upfront investment for a higher quality of seed will save money over time.

“You could probably go with the cheapest variety,” she says. “But you're probably going to be paying for it in the long

heat of the summer, in July and August. But it's still unsightly, so you want to have a variety that's got some good tolerance for that."

Bonos also deals with copper spot, something that most superintendents don't encounter.

"(Copper spot) reminds me a lot of pythium," she says, "because it comes on really quickly. It's got these small orange spots and it can come on very quickly and really damage your grass. But typically you don't see it when you're spraying preventatively. We don't spray preventatively in most of our trials and we do see it. And it's not related to dollar spot resistance so you could have



Rutgers University's Dr. Stacy Bonos works extensively with bentgrass. "You could probably go with the cheapest variety," she says. "But you're probably going to be paying for it in the long run with additional fungicide applications."

a variety (of turfgrass) with good dollar spot resistance that is susceptible to copper spot."

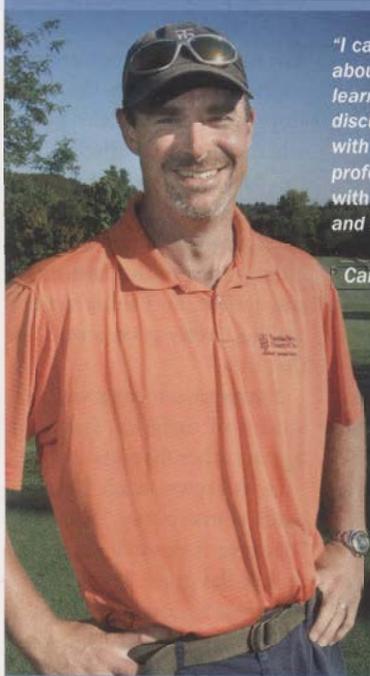
While dollar spot draws much of her attention, Bonos and her colleagues are continuing their efforts to develop grasses that will stand

up against a variety of diseases. Achieving that goal reduces the number of chemical applications that are necessary.

"The main thing I would say is we work on dollar spot," Bonos says. "Then we add brown patch, then we add copper

spot, then we add anthracnose. We're trying to get varieties that are resistant to multiple diseases and not just one, so we can really have try to have an impact on the amount of fungicide that's being applied on golf courses." GCI

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DO ROBOTIC MOWERS DREAM OF ELECTRIC TURF?



Paul F. Grayson is the Equipment Manager for the Crown Golf Club in Traverse City, Mich., a position he's held for the past decade. Previously, he spent 8½ years as the equipment manager at Grand Traverse Resort & Spa. Prior to that, he worked as a licensed ships engine officer sailing the Great Lakes and the oceans of the world.

After reading GCI's October story and listening to the accompanying podcast about Cub Cadet's RG3 Robot Greens Mower, I wondered if this would be a solution to Crown Golf Course's growing labor shortage. As equipment manager, I read technical manuals for fun. Each machine has an operator's manual, a parts manual and a shop manual. These manuals tell me most everything there is to know about the operation, maintenance and repair of the machines they accompany. So, for a new piece of machinery, studying these manuals is the best and fastest way to get acquainted, understand how it was built and how it works.

Unfortunately for me, the manuals for the Cub Cadet are only available to someone who has purchased the machine/system. While not common, suppliers sometimes do this, which puzzles me. Anything patentable would have been patented before manufacturing the machine/system. And if it is all protected by patents, why keep me away from the manuals?

Another way to find out what it is like to live and work with a machine is to borrow it from the dealer for a few days. This common practice is known as a "demo" – short for "demonstration."

Unfortunately, demos of the RG3 are not only unavailable, they are not possible because it takes a team of 10 people three weeks to "install" the machine and required infrastructure, and to start up the system. I have seen this before; an early version of an automatic floor scrubbing machine I worked with had a similar lengthy install process. The floor scrubber people eventually streamlined the install process down to 30 minutes. Perhaps Cub Cadet will follow suit.

The price of an individual RG3 does not reflect the installed cost of the system. For an 18-hole course with a 19th green for putting, the installed cost of the entire system is about \$225,000. Once installed, it requires two full-time employees to operate. While this price sounds outrageous, properly applied the system pays for itself in four years, and then continues to save the course money.

As it turns out, Michigan is outside of their service area and will not be supported until 2017. In a phone conversation, the representative was kind enough to spend time with me and we ran through some of the hypothetical calculations as if I were a customer. He looked over the course using Google Maps images. We plugged some of Crown's numbers into their return-on-investment calculator spreadsheet which showed the club was not a candidate for installation. It would not make economic sense.

The first strike against us was that we are a six-month course, which would double the time required for savings to offset the cost. The second strike against us was the course, at the moment, is too lean an operation. The fat that install-

ing a system would trim out of an operation is nonexistent. There was also the question about going back to walk-mowed greens after having been mowing them with a triplex. The ideal customer would be walk mowing their greens, rolling them every day and inclined to automate that process.

While I am disappointed the RG3 robot greens mower is not the mower for the Crown Golf Club's golf course, I did learn a lot about the machine and its operation. It sounds like the RG3 is for about two-thirds of U.S. golf courses, so maybe your course could benefit from the RG3 system.

The other mowers I looked at, a greens mower, fairway mower and



rough mower, are stand-alone mowing systems and do not require the installation of any infrastructure. They're dispatched from the shop storage area, mow and return themselves to their parking spot. Mowing patterns are programmable and selectable so you can put in the seven-day pattern of mowing differently each day. These mowers cost about twice the price of the same mower without the self-driving feature. Just figuring the savings from not having a driver, the guidance system looks like it will pay for itself in about three years.

There is one problem. When I contacted the salesmen for each of these companies to check on price and availability they each said, "what self-driving mower?" **GCI**



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.



COMPUTERIZED JOB BOARD

An old Toro irrigation computer using Windows 7 to access the Internet was recycled to operate the job board on a Samsung 55-inch LED TV with multiple HDMI inputs (one for the computer and one for the Apple TV). The computer, keyboard and Apple TV with remote is located next to the TV. Any computer can be used for this application as long as it has HDMI outputs. The job board was created on Google Sheets (similar to Excel) and the categories are limitless because anything produced on Google Drive can be shown on the TV. The job board is used to show the type of tee times (straight tee times, shotgun start, crossover tee times), the first and second job assignments for the day, other projects to be completed, and any other messages supervisors want to communicate to staff – such as safety and quality issues, mowing directions, and perimeter mowing instructions. Google Earth shows the staff specific areas on the golf course they need to be working on. Local radar is displayed in the corner of the screen to alert the staff of potential rain and lightning. Supervisors can also use their iPhones to take photos and videos on the course that can be shown on the job board for employee training. The entire project cost about \$1,200 for the TV, mounting bracket and Apple TV, and it took about an hour to mount and hook it up. Michael R. Wallace is the superintendent at the Naples Lakes Country Club in Naples, Fla.



S.O.A.P.

These Standard Operating & Agronomic Procedures (SOAP) pocket guides are provided to each employee to help them do a better job. There are nine different nationalities working at the Desert Mountain Club in Scottsdale, Ariz., on their six golf courses. Each nationality works together on a respective golf course with their interpreters and they have their own pocket guides of specific job duties in their native tongue. College interns observe the existing books and rewrite them as the goals and objectives are updated and changed. The pocket guides, modeled after yardage books, are very durable, as they are laminated and waterproof, the text is well written, the photos are very specific and they last approximately eight months during the entire golfing season. They are now printed in-house, they allow the same operating procedures to be done the same way on all six golf courses and they cost about \$1.50 each to produce. The pocket guides were conceived by Shawn Emerson, director of agronomy, and Brad Seiler, former golf course coordinator.

(KAMINSKI continued from page 32)

gets many of the students to the GIS. Administrators are more likely to support teams participating in some sort of student event or competition.

In 2016, Penn State will be sending 18 students to San Diego. While the students are expected to participate in the Turf Bowl, they are also encouraged to walk the trade show floor to see what the industry has to offer. This serves as a networking opportunity, as well as a chance to pick up some free swag which they seem to enjoy.

The competition also encourages students to study, train and learn as much as possible about what awaits them in the industry. They are exposed to a variety of topics that show the diversity of the industry. Many universities even offer class credits for taking Turf Bowl preparation classes. All positives in my book.

TAKE THE COMPETITION WITH A GRAIN OF SALT

If you're a student on a Turf Bowl team, then just know that if you don't "win," you should still get something positive out of the experience. If you're an alum of a participating team, then just know that it places in no way represents the quality of the university's turf program. It honestly means next to nothing.

As a faculty member at the university who currently holds the championship trophy, I would offer these parting thoughts. If you're a student competing in San Diego, then I wish you the best of luck. Study hard and compete hard, but don't lose sight of the opportunities that the GIS has to offer. You have been given the opportunity of a lifetime for a student and regardless of where you finish, the industry is proud of you. **GCI**

(BRUSH continued from page 58)

core 648, a successor to the Hydroject. Jeremy Opsahl, Toro's global marketing manager, says it can do core aeration as well as non-invasive aeration. "Some will say, 'It does a good job, but I want something that leaves absolutely no trac,'" he says. "That's what the Hydroject did."

Superintendents throughout the industry are being asked to accelerate the aerification process to reduce its impact on their facility's bottom line. With that thought in mind, a minimalist approach is very appealing in a number of levels.

"Superintendents are now asked to do more with less," Opsahl says. "They're also asked to get cultural practices like aeration done much quicker so greens can be back in play and generating revenue. So they're thinking, 'How can I change what I'm doing to meet the pressures I'm facing?'" **GCI**

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



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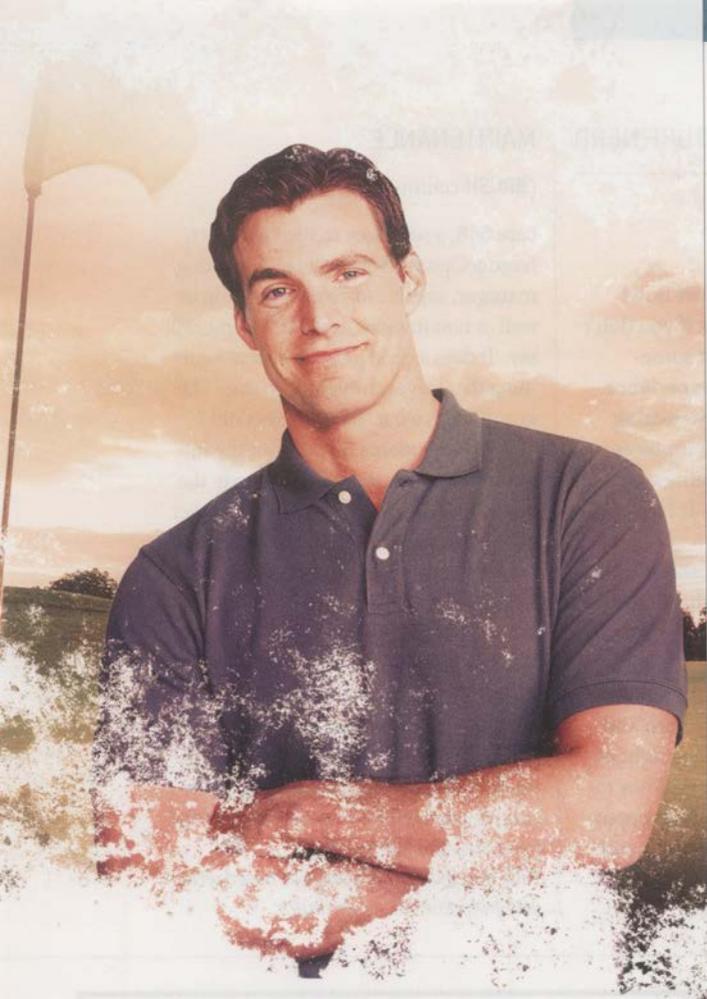


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GOLF COURSE
INDUSTRY

OUTSIDE THE ROPES

(MORAGHAN continued from page 26)

TOURNAMENT CONDITIONS

Does the average member or golfer really understand what this means? And as a superintendent, do you really want to subject your players to these? Remember – your job is at stake.

LONG PUTTERS

How is the game going to benefit by banning a tool that helps a few people play/putt better? If the grand poohbahs of golf (hello, Scotland) are that upset by aesthetics, I can think of some much uglier places to start. Like their wardrobes.

ROLLING BACK THE BALL

A less lively golf ball means Bubba will hit it “only” 325 yards rather than 350. I can live with that. But not if it means my 81-year-old father-in-law now hits it only 160 rather than his usual 200. He just lost 40 yards of enjoyment.

GOING NATIVE

Taking established turf out of irrigation – primarily in hard to maintain areas like hillsides – isn’t going to save that much water. Native areas still require maintenance. And if El Nino does hit California as forecast, what part of the course do you think is going to wash away first?

GRASSES

Ultradwarf or hybrid Bermudagrasses continue to replace bentgrass in unlikely places. The further north you go, the further south you get. Are we taking Bermuda too far north? How will it grow in Philly in February?

MILLENNIALS

Has anyone listened to what the under-30 set wants? I have, and what they want is to play different courses, play with their buddies and have a good time. Sounds good to me. So how do we make that happen... and, consequently, grow the game intelligently?

PESTICIDES

Why is it that chemical compounds very much like what you use to combat jock itch are being banned from golf courses? So it’s OK to sprinkle it on my foliage but not on the course’s? Has regulation gone a little overboard?

BIFURCATION

Maybe two sets of rules actually would help the game.

All I’m saying is think before you act. Don’t do anything stupid to your course, your members and their guests, or your staff. Maybe if we all start thinking first — in all aspects of our jobs, in all aspects of this great game, in all aspects of our lives — we can bring Common Sense back from the dead. **GC**

COMPANY	WEBSITE	PAGE
AMVAC	amvac-chemical.com	5, cover band
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Bayer	BackedbyBayer.com	43
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Cushman	cushman.com	41
EarthWorks	EarthWorksTurf.com	27
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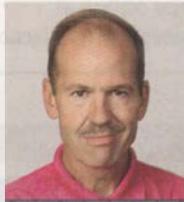
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THE ROAD LESS TRAVELED



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

One thing that jumps out at me from our new State of the Industry research, it's that many of you are finding ways to beat the odds. Yes, in your departments, there is healthy growth on the operations budget and capital spending lines. Clubs and facilities are figuring out they need to invest in the big green thing because that's why people show up. It's lovely to have nice clubhouse curtains and a wine cellar full of old bottles, but the golf course is any facility's heart and soul of and it's good to see funding for maintenance and construction.

But our new research shows golf is also beating the odds in a larger sense. Specifically, despite the fact the weather has largely been against us and there's zero indication more people are spending more money on golf, the number of profitable operations continues to grow. When we first started tracking profitability in 2011, only 33 percent of facilities said they were in the black. Now, that benchmark number has risen to a post-recession high of 45 percent.

There are a bunch of reasons for this: better cost management (particularly in unprofitable F&B departments); improved focus on customer service and marketing; trying new things to attract and retain members and outings; intelligent flexible pricing; investing capital in things that will generate more revenue, etc. Mainly I believe good facilities are aggressively stealing market share from poor ones.

The bottom line is we're finally getting smarter after decades of fat-and-happy dumbness. The recession was a much-needed wake-up call. Now, we're beginning to run clubs and courses like real businesses instead of half-assed operations that counted on the rising tide of play or their "everybody knows how good we are" reputations to generate revenues. I also believe there's more accountability and collaboration at the GM and operations level than ever before. Good managers matter greatly.

This is all good news if you're part a well-run operation evolving along a healthy path to the future. It's not such a good thing if your operation is mired in golf's old business model. The market is beginning to bifurcate. That's a fancy way of saying the gap between facilities that will be successful for decades to come and those that won't is starting to widen. How can you tell which path you're on? Here are a few clues...

If your operational mantra is "we'll be fine once the golf business bounces back" or "all we need is some decent weather" you should update your resume immediately. Doing nothing is not an option.

If your facility doesn't have a strategic plan, master plan or even a capital improvement plan that addresses key infrastructure issues, you should consider

grabbing your parachute and jumping out of the plane before it runs out of gas. The time to start planning for the improvements you need now is five years ago.

If your club or course doesn't have a strong culture of customer service and a hospitality-first ethic, you may want to pack your bags. In a future where fewer people are likely to seek the club experience or simply don't play golf as often, making people feel welcome and appreciated is job one.

If there's an "us vs. them" mentality among your fellow managers, get off the bus. Working in silos and not being on the same page as your peers is a recipe for failure.

This trend toward bifurcation is real and I believe it will accelerate over the next 10 years. Courses that take the road less traveled – the one of investment, focus and smart management – will do well in a future where we all have to fight for a bigger piece of a smaller revenue pie. Those that stick to the beaten path of mediocrity and selling rounds of golf on price will struggle mightily and, perhaps, fail.

So, the golf market of the future will be smaller, smarter and more focused on delivering customer value in multiple ways. Where does that leave superintendents?

Frankly, all signs point to your stock being on the rise...assuming you are on that road less traveled. There is more recognition than ever before that supers are the critical linchpin in the success of good operations. Furthermore, in the regulated environment of tomorrow where water use and inputs are being watched closely, the superintendent becomes a key resource manager who not only has to manage the golf course but document and defend its value to the outside world. Finally, in the smaller, hyper-competitive world of golf in 2026, having a top-quality course will be a given for successful operations. You just can't do that without a great superintendent. **GCI**

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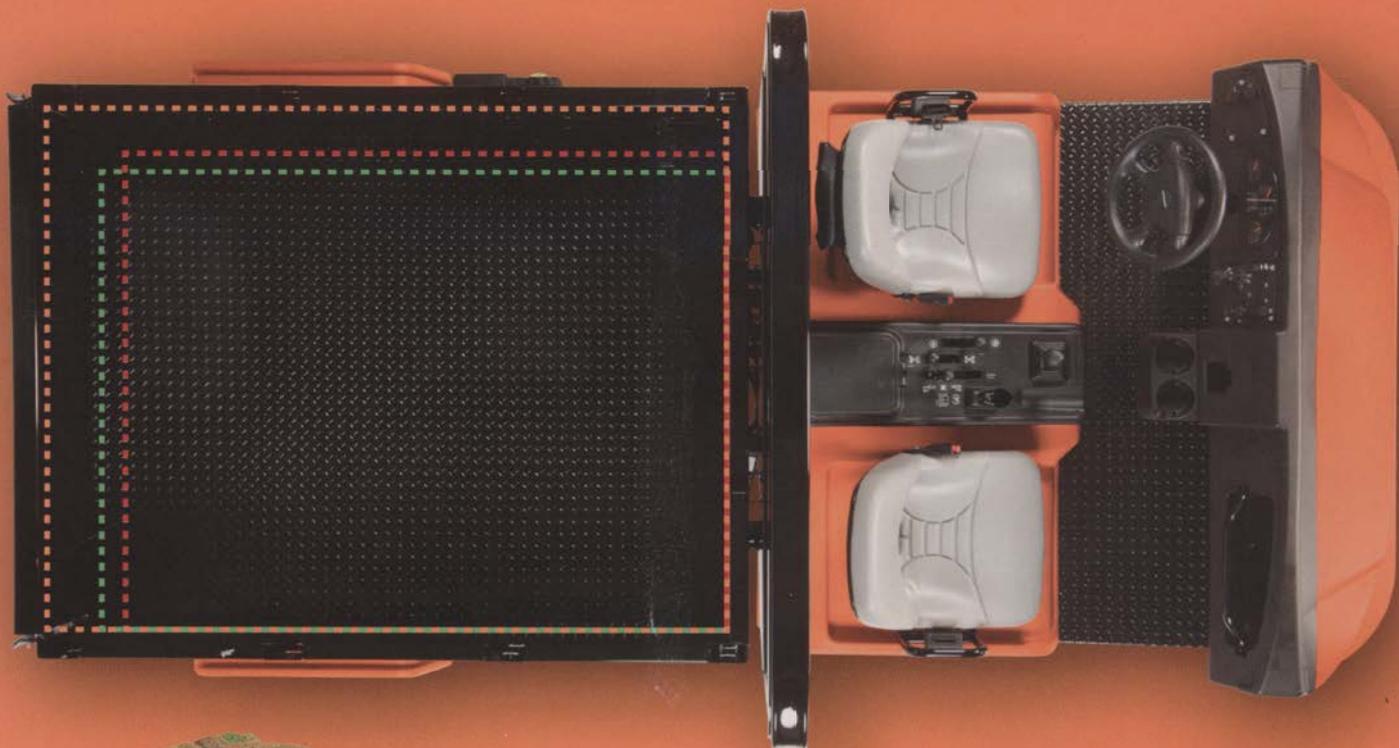


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