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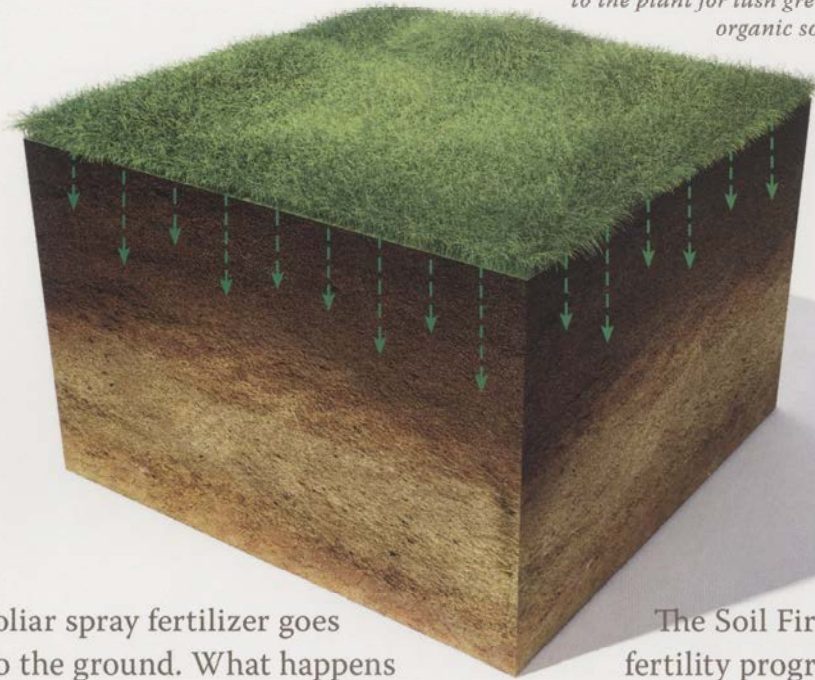


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**ON THE COVER**

Mike Wyatt of Greenbrier Photography took this group shot on The Old White TPC course at the resort.

VOL. 28 NO. 5

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TEERING OFF

## TURF DIVERSION

To understand the role golf course maintenance plays at a resort, often you are diverted from the original purpose of your trip. You visit a wedding chapel that looks 125 years old only to be informed it opened last year, eat a bowl of peach soup and discuss clay court maneuvers with a tennis pro, and limited time at a fascinating place drifts away quicker than a ball landing on the wrong side of Oakmont's greens.

Completing this month's cover story required a visit to The Greenbrier, a West Virginia resort with a bunker that was built as a Cold War shelter for Congress and enough activities to occupy politician's families when they visit. PGA Tour players, high-rolling golf savants willing to drop \$300 to roam pristine turf and even NFL players visit The Greenbrier, which rests between Beckley, W.Va., and Roanoke, Va. I consider the resort's location one of the most scenic places you can possibly build golf courses – or football fields.

Before committing to the story, I asked numerous industry contacts what they knew about The Greenbrier and its maintenance practices. Did anybody in our industry realize a crew in southern West Virginia was maintaining turf for PGA Tour and NFL players? Fortunately for the sake of producing a cover story with broad appeal, little awareness of The Greenbrier's turf activities existed outside a pocket of Mid-Atlantic superintendents and suppliers.

The New Orleans Saints – a team that wears black and gold and boasts a future Hall of Fame quarterback – moved their training camp to The Greenbrier in 2014. The move was announced before the resort had completed its two grass and one synthetic practice fields. The pressures facing director of golf course Kelly Shumate and his staff are described in the story.

The arrival of the Saints represented a tremendous diversion for a crew already moving in numerous directions. It also represented an opportunity to showcase turf knowledge in new ways. The Greenbrier isn't the first place to maintain golf courses and athletic fields. Think of all the municipalities offering both amenities to residents. But we're guessing Bubba Watson isn't smashing 330-yard drives and Drew Brees isn't planting his feet and zipping darts on your town's turf.

The Greenbrier's story is impressive because it handled most of the heavy lifting internally. Shumate and his team quickly discovered turf skills acquired through maintaining golf courses apply to sports turf. Carrington Bryant, a young, energetic presence on Shumate's crew, oversees the maintenance of the fields. Bryant took classes in golf and sports at Horry George-



**Guy Cipriano**  
Assistant Editor



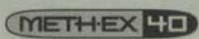
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town Technical College. He arrived at The Greenbrier as an assistant superintendent. His turf knowledge and zest for football convinced Shumate he didn't need to look for an outsider to maintain the fields.

"Your basic agronomy is going to be the same," Bryant says.

"Drainage, irrigation are all the same. Playing conditions are a little bit different. Golf is all about firm and fast. A football field is maybe not as firm and fast as you want a putting green to be. Other than that, they are both very detail-oriented in their own little ways."

A day maintaining a field for NFL players

**“ The arrival of the Saints represented a tremendous diversion for a crew already moving in numerous directions. It also represented an opportunity to showcase turf knowledge in new ways.”**

begins with removing the dew from the field around 6:30 a.m. Bryant and his crew, which consists of two members of the turf team, fill divots between whistles and snaps during morning practices. More divots are filled and debris is blown off the fields during breaks. Mowing the 3.88 acres of

Kentucky bluegrass takes 1 hour, 15 minutes and occurs between morning and afternoon practices five or six times per week.

The most perplexing part of adjusting to sports turf, according to Bryant, is learning how to properly paint fields. In short, it's much more intricate than painting any part of a golf course. "Painting out of bounds

markers doesn't prepare you for it," Bryant says.

Cultural practices such as verticutting and topdressing are more frequent and intense and mowing heights are much lower on a golf course, Shumate says. Saints coach Sean Payton and facilities directors Terry Ashburn provide input on the height of cut, which is slightly below an inch. When the PGA Tour and Saints aren't in town, the fields are easier to maintain because they receive less use, allowing Shumate and Bryant more flexibility in maintenance practices and staffing.

Expectations are similar. If the turf doesn't hold steady during those key summer weeks, fewer people want to conduct weddings in the chapel or eat the peach soup. Whether it's a golf course or football field, The Greenbrier proves tremendous turf adds value to other diversions. **GC**

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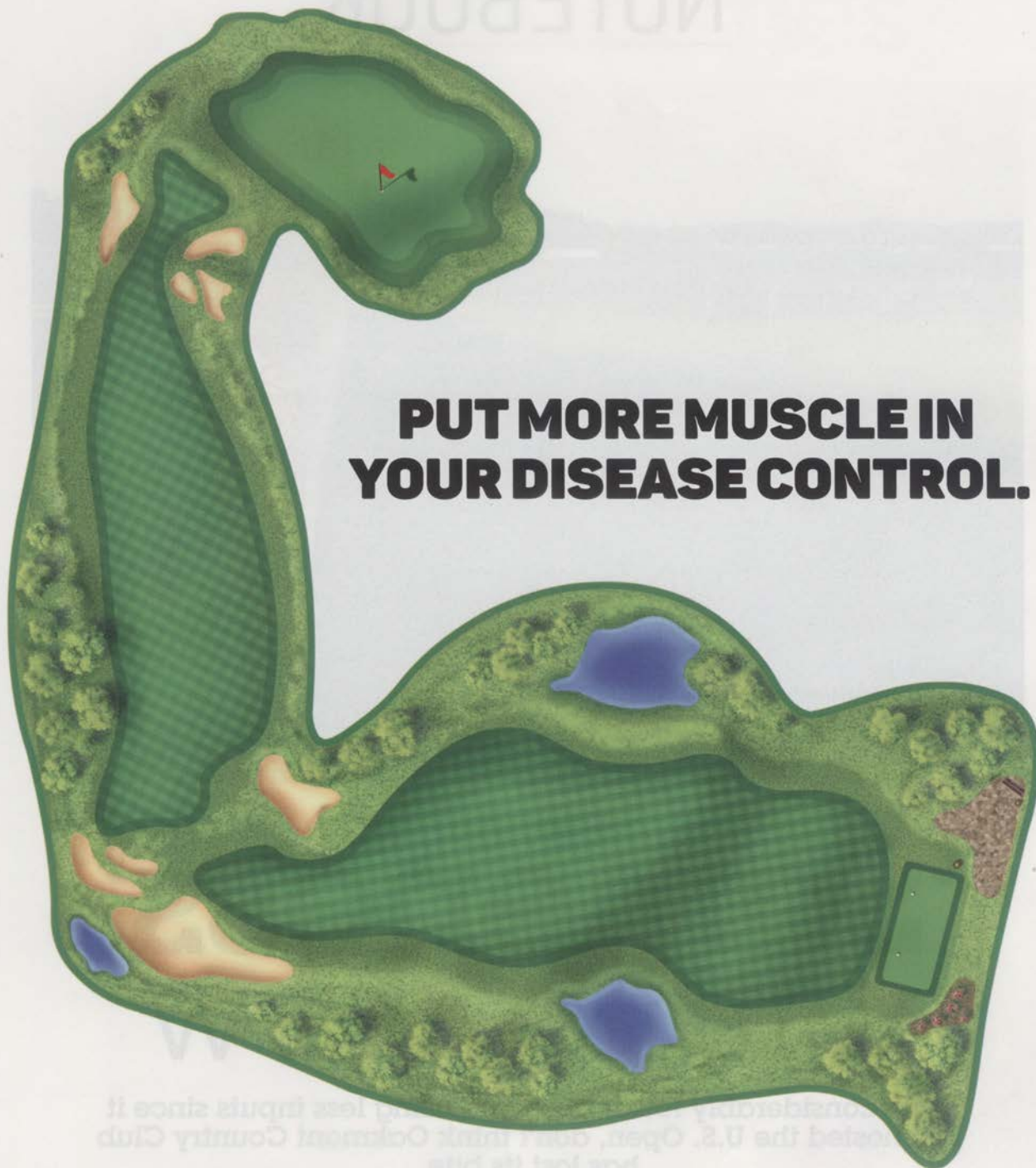
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# NOTEBOOK



John Zimmers is preparing for his second U.S. Open as the superintendent of storied Oakmont Country Club in Western Pennsylvania.

## 'Sameness' with a view

**With considerably fewer trees and using less inputs since it last hosted the U.S. Open, don't think Oakmont Country Club has lost its bite.**

*By Guy Cipriano*

Standing beside a practice putting green that doubles as storied Oakmont Country Club's ninth hole, superintendent John Zimmers gazes at a golf course he started managing in 1999.

The view provides few obstructions, with the only eyesore being a red-roofed convenient store beyond the

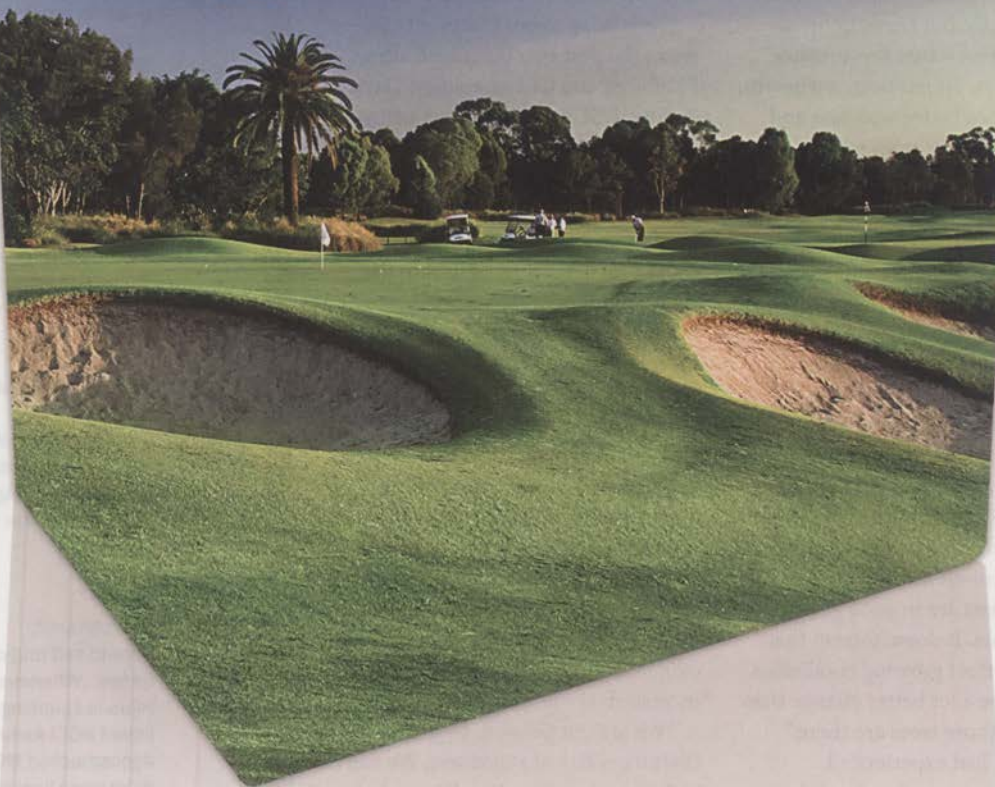
club's property. What seemed unimaginable when Zimmers arrived at Oakmont gradually has become the norm and represents the biggest change for a property offering what USGA executive director Mike Davis refers to as a bunch of "sameness" since it last hosted a U.S. Open in 2007.

Oakmont's days as a parkland golf

course are over. Zimmers can see 17 of 18 flagsticks from where he's standing on this gorgeous late-April afternoon, which happens to be 52 days before the club hosts a record ninth U.S. Open. Zimmers estimates restoring Oakmont to resemble the vision Henry Fownes originally intended for the Western Pennsylvania



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property required removing 14,000 trees, including 6,500 since the 2007 U.S. Open.

If any course can host a U.S. Open on a whim, it's Oakmont, according to Davis. The daily demands mean no respites for Zimmers, his top assistant, director of U.S. Open operations and projects David Delsandro, and the rest of 45-member turf team. But views like the one from beyond the ninth green mean maintaining championship turf is a bit easier when the weather cooperates.

"The main intent was to restore it architecturally, but the benefits are less leaves, less water, less fertility," Zimmers says. "It has been a win-win. The grass does better with sun and wind. No complaints on my end."

Fescue, which covers 70 to 80 acres of the 260-acre property, has replaced deep, lush rough in areas surrounding the fallen trees. The transformation has improved the growing conditions throughout the course.

"One of the biggest challenges on any golf course are growing environments, not having good air movement, not having good sunlight penetration," USGA Green Section Director of Championship Agronomy Darin Bevard says. "It's just not an issue at Oakmont anymore. Most of these greens are in good growing environments. It doesn't mean that there are perfect growing conditions, but they have a lot better chance than when all of those trees are there."

Oakmont had experienced ideal pre-major growing conditions through late April. Zimmers says the course is close to being a month ahead of where it stood at the same point in 2015. Zimmers and Delsandro break the period leading into the U.S. Open into a series of one-day tests, and firm April turf represented an encouraging sign. The dry early spring followed a mild winter by Western Pennsylvania standards. Still, avoiding complacency has helped Oakmont develop one of the industry's model turf departments,

and Zimmers says much can change between late April and June 16, especially if soggy weather interrupts the construction of U.S. Open infrastructure.

Rain also might be the only obstacle preventing a punishing championship. Davis says Oakmont will play to the same yardage with the same fairway widths and contours, jarring green speeds, deep grass heights, penal bunkering and "wonderful course condition" as it did in 2007. Angel Cabrera won the tournament with a four-day score of 5 over par.

Everything about Oakmont contrasts the past two U.S. Open sites Pinehurst and Chambers Bay. Davis and the USGA used both venues as a forum to demonstrate less irrigation and more brown can yield championship turf. The appearance of both courses shocked many golf fans and caused mixed reactions within the turf community.

A different message should emulate from Oakmont, which Davis says "meets the gold standard of a rigorous championship test." Oakmont's greens, tees, fairways and primary rough look as green as ever, but the stunning aesthetics are being accomplished in leaner ways. Besides areas requiring less water and fertility, Oakmont has added mowers with hybrid technology to its fleet, incorporated more data into its agronomic program and increased its volume of hand watering.

"We are not going to look like Chambers Bay or Pinehurst. We can't look like Chambers Bay. We can't look like Pinehurst," Zimmers says. "We are going to be Oakmont. We have different soils. We have different grasses. I think the general public should understand that. They are on sand-based soils. We are on clay-based soils. All of those things have a huge impact. We have a great story. Our story is we have fescues, we have used less inputs, less water, less fertility. All of that kind of ties together, just different aspects. It's a different piece of property." **GCI**



## From THE FEED

We'll have much more about the debut GCI Technology Conference in our June issue. Until then, we'll let our followers describe in their own tweets what happened April 11-12 at Carolina Golf Club.



**Matthew Wharton**

@CGCGreenkeeper

Want to thank @GCI Magazine & Co. for an amazing two days of networking & education @CGC1929! Thanks to all my peers that attended! #GCI Tech



**Paul Van Buren, MBA**

@HarryLigule

@CGCGreenkeeper @GCI Magazine @CGC1929 A phenomenal experience. Thanks for hosting! Your club is fantastic!



**Justin VanLanduit**

@TurfTank

Excellent event with some great minds sharing knowledge. Thank u @GCI Magazine and @CGCGreenkeeper for hosting us.



**Jared**

@JaredNemitz

Note to self and other turfies...Whenever Tim Hiers is speaking go and listen! #GCI #smart #leader #gobsnacked @GCI Magazine @PatJonesTweets



**Kevin Smith**

@grantierra58

Take Home: "Data Driven Decision Making" quote from @ToroGolf Dana Lonn #smartestguyintheroom full of big brains! @GCI Magazine Tech Seminar



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# TIME FLIES



**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](mailto:groots@charter.net).

**C**old winter weather greeted our first Wisconsin Turfgrass Association meeting of the new year. It seems odd to meet at a time when there is no green grass in the landscape.

For the sake of newly elected members, the president asked each of us at the table to introduce ourselves and note a favorite turfgrass maintenance tool. A sod producer spoke of his GPS mowing and sod cutting controls, a couple of superintendents mentioned the Spectrum TDR 200 moisture meter, another announced his love of the Toro 648 aerifier and the Lynx Control System got two votes.

Believing in the modified “there’s no tool like an old tool,” I cast my vote for the Par Aide cup cutter. From my first day until 50 years later, it has the same design and remains a very important tool on a golf course. The task has always been important and this low technology tool did (and still does) an excellent job.

I learned how to cut cups for an old gentleman of 75-plus years who had spent his life working at the course, and those days he was maintaining flower beds, clubhouse landscaping and occasional duty cutting cups. He recalled hauling manure from the fairgrounds to either compost or spread on fairways and roughs. He planted many of the trees on the golf course as small saplings harvested from the surrounding wooded undeveloped areas. As we would visit about the course history – recent history for him – he would often muse, “how time flies.” He was right – between the two of us, now that I am 70, a century of golf in our town was covered.

In 1952, my mother turned 30, and I recall her grouching to a neighbor – Mrs. O’Neil – about growing old. It was her 30th birthday. I was six at the time, but still a little worried my mother was concerned about age. I asked her when I would be 30, and she thought a second and replied, “in 1976.” Well, that year has come and gone so quickly it is hard to believe. Time flies.

A superintendent colleague of mine is getting ready to retire. He and his wife are each 62, and as they did their planning they realized each of their mothers was widowed at that age. Surely, those two mothers fully realized that time flies. That notion cemented my friend and his wife’s decision to move on to life’s next station.

I guess we all realize, at some time, how precious the present is to us. So it was in biblical times and so it will be centuries from now. The present may seem to move painfully slow at times, especially when we are under enormous stress at the golf

course, but suddenly it will be past history. I am always finding myself looking back and meditating on the events and people and the years of my past. If it hasn’t happened to you yet, trust me – it will. And much of what you will contemplate will somehow involve golf.

The fact time flies for most of us can influence attitude. When you are on the 14th fairway of life, perpetual optimism is an important ingredient to happy days. And continuing to contribute to the fabric of the society we live in takes on added influence. I can think of few in golf who have handled the passage of time better than Arnold Palmer. He won the Masters four times, played in 50 events at Augusta and has been a fixture all the times I have been lucky enough to attend. In one of his last competitive rounds, somewhere on the back nine during Friday’s round, he came over to the ropes where three of us were standing. We were the only spectators following him, and he came up to shake hands and say hello. “I’ve got to get it going, boys!” he said to us. We could have gone home right then we were so happy. Arnie ended his competitive playing in the Masters in 2004.

From there it was the ceremonial first tee shot and the par-3 contest. But last year he stopped playing in the par-3. And this year he resigned from hitting the ceremonial first tee shot. He is still attending the Champions Dinner and will be present on the first tee when Jack and Gary hit their ceremonial shots. Here is what Arnold said: “I would love to go on doing it forever, but I don’t have the physical capability to hit the shot the way I would want to hit it.”

He is recognizing that time flies. Instead of being depressed, he moves on to other activities he can handle.

So, go ahead. Take a peek at the rear view mirror. Just don’t live in the past. Use that view to see if you missed any turns you want to make when you have the time. But don’t dither; remember, time flies. **GC**

“When you are on the 14th fairway of life, perpetual optimism is an important ingredient to happy days.”

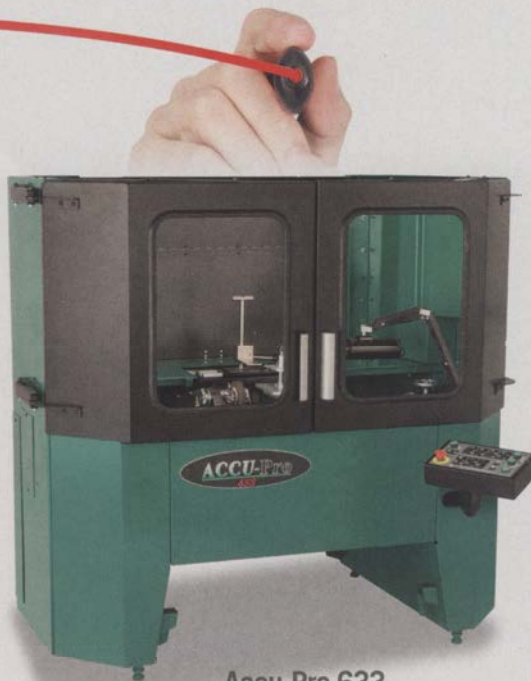
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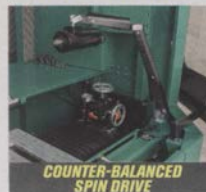
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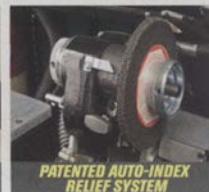
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# They Bleed GREEN

**THE GREENBRIER TEAM** not only preps a PGA Tour course, but they provide perfect field conditions for the NFL's New Orleans Saints. Learn how they successfully juggle it all.

By **Guy Cipriano**

**W**hat's next makes agronomic life at The Greenbrier hectic, even if idyllic surroundings and relaxed demeanors mask the efficiency needed to satisfy a billionaire owner.

In the summer of 2014 the next thing coming to the southern West Virginia resort caused internal trepidation for Kelly Shumate. The resort's director of golf course maintenance since 2010, Shumate knows owner Jim Justice well enough to understand reasonable excuses carry scant significance in matters involving The Greenbrier's reputation.

No spot in West Virginia attracts more influential visitors, including dozens who make millions competing on turf. By extension, what happens at the 11,000-acre resort established in 1778 affects the reputation of the entire state.

Effective managers shield their concerns from others. So, quietly on a July afternoon in 2014, Shumate took a solo Gator ride on a pair of practice fields that didn't exist in any imagination eight months earlier. He floored the gas and then slammed the brakes. He stopped and examined the condition of the Kentucky bluegrass below the tires. The roots held strong.

The ride proved surfaces cultivated by his team could handle the violent wear produced by an-

Kelly Shumate has served as The Greenbrier's director of golf course maintenance since 2010. The West Virginia resort will host the PGA Tour's Greenbrier Classic and New Orleans Saints' training camp this summer.



The Greenbrier Classic has been a staple of PGA Tour summer schedule since 2010. This year's tournament is July 7-10.

other team. The New Orleans Saints were bringing a \$133 million roster to White Sulphur Springs, W.Va., to start training camp a week later.

"After I did that little test, I knew we were good," Shumate says. "When you are talking about those \$10 million kneecaps, I get so nervous. The field, the big building and all the prep work ... But if the field wasn't ready, it was all for not. I was really feeling the pressure of making sure that we were going to be good to go."

Here's the part that separates The Greenbrier's tale from other ones: the PGA Tour had left the resort less than three weeks before the Saints arrived. Shumate's team learned how to build and maintain NFL-caliber fields while preparing a course for PGA Tour play and maintaining two resort courses.

Hectic is the routine at The Greenbrier. The PGA Tour returns for a seventh straight year this July; the Saints are

returning for a third straight summer; thousands of visitors are returning for rounds on The Old White TPC, Greenbrier and Meadows courses.

And, yes, what's next has already been determined. Justice somehow convinced Jack Nicklaus, Arnold Palmer, Gary Player and Lee Trevino to combine on the design of an 8,000-yard private course that will sit atop a 2,400-foot mountain less than five miles from the resort's stately entrance. Shumate, who also oversees the maintenance of an 18-hole Tom Fazio-designed private course, a 132-year-old nine-hole course and Brier Patch Golf Links in nearby Beckley, seems a bit surprised when a visitor suggests the agronomic operation isn't normal. "I guess I'm into a lot," he says. "But I have a lot of really good people helping me."

#### HURRYING FOR THE NFL

When you hail from southern West Virginia, Jim Justice is

your local billionaire. In fact, he's the state's only billionaire. Justice's holdings include numerous coal- and agriculture-related businesses, but enhancing The Greenbrier became his primary business focus when he purchased the resort from CSX Transportation in 2009.

Billionaires pounce on opportunities, and Justice, who grew up in southern West Virginia, started noticing one upon hearing New Orleans Saints coach Sean Payton's effusive praise of the resort after he caddied for PGA Tour player Ryan Palmer in the 2013 Greenbrier Classic. Two weeks before that Christmas, Justice inquired about Shumate's availability for a post-holiday meeting. Justice also made what seemed like a random request: he wanted Shumate to begin learning how to build a football field.

Google searches and calls to industry friends who manage sports complexes occupied

Shumate during the holiday. The more Shumate learned about the construction and maintenance of football fields, the more he realized the process is "like building a big golf green." But, "Mr. Justice just said football field," Shumate adds. "I didn't know how many, how big or what for."

The relationship between Shumate and Justice extends 16 years and is different than most head agronomist-billionaire pairings. Shumate was working as the Brier Patch's superintendent until Justice picked him to lead The Greenbrier's maintenance staff three weeks before the inaugural Greenbrier Classic in 2010. Shumate and Justice were both raised in southern West Virginia and are heavily invested in the region. Because of Justice's penchant for boosting the remote section of Appalachia surrounding the resort, Shumate thought they might be building fields for a youth sports organization.



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Consider this one time where Justice had Shumate fooled. Shumate walked into the early 2014 meeting and was greeted by Justice and multiple Saints executives. The group handed Shumate blueprints of the fields at the Saints' Louisiana headquarters. They wanted The Greenbrier team to replicate the fields, albeit with appropriate grasses for the environment. The Saints – and more importantly Justice – wanted the fields ready for training camp in July. The group asked Shumate if the latest sod could develop the necessary roots to withstand NFL-sized players participating in daily drills. Completing the two natural grass fields by mid-May would give The Greenbrier a chance of hosting the Saints' 2014 training camp. The area designated for the fields is located

on a hilly section along the road leading to the resort's section. Trees covered the land, slate rested below the ground.

Picking the proper sod and sand represented the two key agronomic keys to constructing the fields, according to Shumate. The Greenbrier team toured multiple sod farms before selecting a low-mow variety of Kentucky bluegrass from a New Jersey farm. Shumate describes the sand they selected as being “a little bit firmer” than sand

“We have a lot of guys on our crew that love working here. We tell them they kind of bleed green for Greenbrier.”

—Kelly Shumate, director of golf course maintenance, The Greenbrier

used on golf courses.

Construction started in March, and Saints facilities director Terry Ashburn assisted with key agronomic and logistical decisions. Dates are foggy because of the frantic nature of their jobs, but Carrington Bry-

ant, an NFL fan and Meadows course superintendent, remembers the vibe when full-time staff members first saw the field blueprints in Shumate's office.

“Kelly had a big map out

and he said, ‘We're going to do this,’” Bryant says. “And we asked, ‘Where?’ He said, ‘That hillside over there.’ So we did it.”

Bryant's statement epitomizes the let's-do spirit of The Greenbrier. A crew combining lifelong southern West Virginians and turfgrass travelers whose careers brought them to southern West Virginia completed a project involving staggering numbers – Justice spent \$30 million to build two grass fields, a synthetic field and sports performance center – without seeking acclaim or attention. The project took less than three months to complete. Nobody got hurt because of loose roots or poor drainage, and the Saints returned to West Virginia last summer, bringing the New England Patriots along for two days of joint practices.

#### 'BLEEDING GREEN'

The reputation of those big greens on the side of the hill is spreading. Instead of flying home after facing the Detroit Lions last fall, the Arizona Cardinals practiced at The Greenbrier for the following week's game at Pittsburgh, making Shumate's staff the only agronomic team to prepare playing surfaces for Drew Brees, Tom Brady, Carson Palmer, Tiger Woods and Bubba Watson in the same year.

The unassuming Shumate uses the first 15 minutes of a nearly one-hour interview in his office acting like the head coaches who conduct practices at the resort. He stresses the enormity of his job decreases because of the team around him. He estimates half of his workers started their Greenbrier tenures before he arrived at the resort, and he credits his



A dedicated maintenance team consisting of West Virginia natives and turfgrass travelers allows The Greenbrier to produce high-level turf on a variety of surfaces. Pictured top from left: Curtis Persinger, Roy Young, Ray Bonds, Carrington Bryant, Kelly Shumate and Chris Anderson. Bottom from left: Marty Maret, Nate Bryant (with dog Freta), Nathan Hollbroke and Josh Pope.

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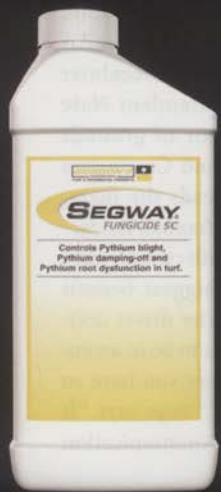


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predecessors Robert Mitchell and Pat McCabe for instilling practices that simplify his job. "We have a lot of guys on our crew that love working here," Shumate says. "We tell them they kind of bleed green for Greenbrier."

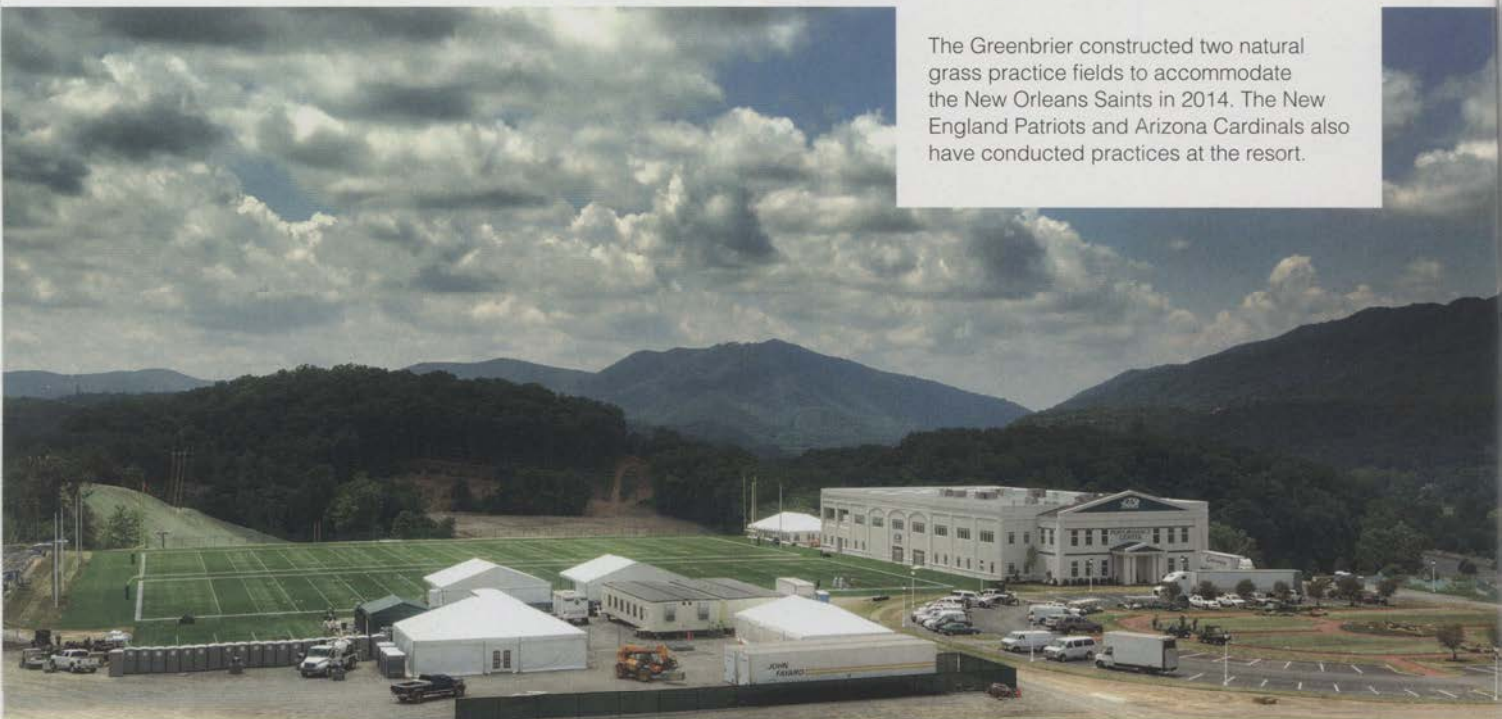
It takes someone with an enormous job to understand what separates The Greenbrier from other operations. PGA Tour senior vice president

Roth worked with The Greenbrier crew to prepare The Old White TPC, which was originally designed by Charles Blair Macdonald in 1914, upgraded by Seth Raynor in 1924 and renovated by Lester George from 2001-06, for tournament play. Thirteen agronomists work for Roth, but he has handled The Greenbrier Classic from the event's inception. Of all the facilities he visits,

TPC. He forged a relationship with Shumate while serving as a Greenbrier Classic volunteer in 2010. The pair kept in contact, and Shumate offered Pope the superintendent position in late 2014. Pope, a North Carolina native, arrived at The Greenbrier after assistant superintendent stints at prestigious Pikewood National and Oakmont Country Club. Like others learning the nu-

a daily basis. We couldn't produce what we produce out there if we didn't have those guys."

Flexibility is a shared characteristic among employees. A peak season crew of 18 is responsible for maintaining The Old White TPC, and employees must be willing and capable of assisting in other areas. Pope and Shumate communicate multiple times per day about the condition of The Old White



The Greenbrier constructed two natural grass practice fields to accommodate the New Orleans Saints in 2014. The New England Patriots and Arizona Cardinals also have conducted practices at the resort.

of agronomy Cal Roth leads a department that oversees agronomy for 146 tournaments on six tours. Roth's relationship with the resort started shortly after Justice purchased the property. Justice and Slugger White, a high-ranking PGA Tour official and West Virginia native, are childhood friends. When General Motors ended its sponsorship of the Buick Open in 2009, Justice lobbied White and other Tour officials for the July date.

Roth says none feature as many longtime crew members as The Greenbrier. Some courses can't keep employees for 70 days; The Greenbrier boasts numerous employees who have worked on the maintenance team since the 1970s. "They have the same mindset," Roth says. "If you give them direction, they find the best way to get it done."

A newbie by The Greenbrier standards, Josh Pope is the superintendent of The Old White

TPC. He forged a relationship with Shumate while serving as a Greenbrier Classic volunteer in 2010. The pair kept in contact, and Shumate offered Pope the superintendent position in late 2014. Pope, a North Carolina native, arrived at The Greenbrier after assistant superintendent stints at prestigious Pikewood National and Oakmont Country Club. Like others learning the nu-

ances of The Greenbrier, Pope quickly became enamored with the staff. "They have so much pride in what they do and they have so much knowledge in the golf course, which is very beneficial to me," he says. "A lot of other places, when the superintendent goes there, they might have to reassemble an entire crew. But our team has been here for so long, they know the golf course and they take so much pride in what they do on

TPC and other agronomic projects. Shumate has similar conversations with Greenbrier Course superintendent Nate Bryant, director of grounds Curtis Webb and Carrington Bryant, who leads the maintenance of the football fields.

Mangers understand what provides the biggest benefit to The Greenbrier drives decisions. "It's great to be in an environment where you have so much going on," Pope says. "It takes a lot of communication



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and a lot of time management and discipline to know where to focus your current day activities at any given time. You have to be able to juggle and be able to help out the greater picture.”

No two days are identical for Shumate, who crafts budgets and agronomic programs and represents his department in meetings with Justice, PGA Tour and Saints officials, course architects, contractors, suppliers, and other industry and resort figures.

#### MAKING IT BETTER

The golf courses feature contrasting agronomics. The Old White TPC and private course include bentgrass greens, tees and fairways; the Greenbrier and Meadows courses are a mixture of bentgrass, *Poa annua* and ryegrass on low-mow surfaces. The nine-hole Oakhurst Links is maintained to replicate a late 1800s experience. The resort's golf season runs from mid-March through mid-November, with the bulk of the play coming May-September.

The Greenbrier Classic, which is July 7-10 this year, occupies daily thoughts, but Pope says preparations intensify in June. Roth arrives in West Virginia a week before tournament and his presence coincides with increased mowing frequencies and a shift to hand watering greens, fairways and tees. The staff is supplemented by around 40 tournament volunteers.

The demands of hosting a summer PGA Tour event at a site tucked between mountains brings agronomic challenges. Foggy mornings are normal, and Pope says dew often returns to leaf blades after the crew completes its morning mowing. Deceptive humidity



The Old White course at The Greenbrier was elevated to TPC status in 2011. The course is one of two at the resort with a professional tournament pedigree. The Greenbrier course hosted the 1979 Ryder Cup and 1994 Solheim Cup.

means bentgrass receives competition from common Bermudagrass in fairways, Roth says.

The mountain views are exhilarating – until they are mixed with perplexing weather conditions. Observing a storm and receiving precipitation from it can be different matters. “You will see a storm moving up through the valley and right when you need some rain during that hot time when it’s dry out, it will miss you. The mountain ranges divert the storm,” Pope says. “You know how it goes in our industry. When it rains, it pours. When you don’t want it, it comes. When you need it, it doesn’t come.”

Following the inaugural Greenbrier Classic, greens were modified and resurfaced with Tye bentgrass. Other improvements to The Old White TPC since the PGA Tour’s arrival, include firmer fairways created via an intensive fairway topdressing program, more efficient drainage and irrigation head adjustments that allow the course to support what Roth calls a “competitive rough” for The Greenbrier Classic even

if dry conditions persist. The PGA Tour elevated The Old White to TPC status in 2011. “Kelly’s non-stop,” Roth says. “He doesn’t settle for what it is this year. He’s going to make it better next year.”

As soon as Roth and the PGA Tour leave town, Shumate frequently fields the same question from staff members. “I love it how the day after he leaves they are coming to me: ‘Did Cal say we were in good shape? What’s going on?’” Shumate says. “That shows me how much they care and how much they value what they do. They want to put on a good show.”

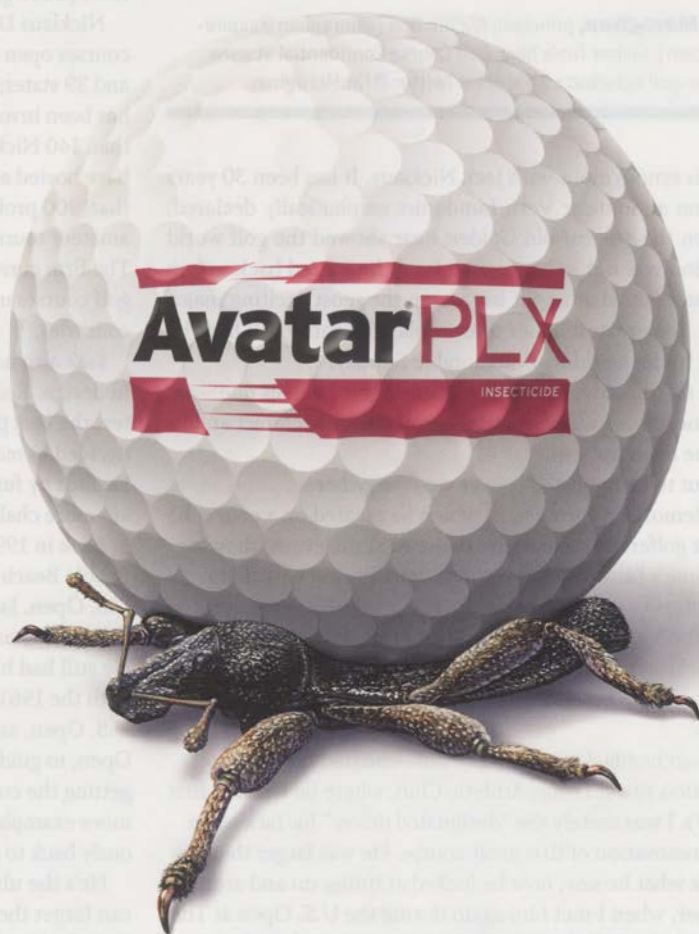
The quality of the recent turf shows at The Greenbrier raises questions about what’s next for Shumate and his team. Is the Nicklaus-Palmer-Player-Trevino collaboration scheduled to open in 2017 the final major project in a frantic decade? Or is their boss – who happens to be running for Governor – plotting something wilder than an agronomist can envision?

Displaying billionaire bravado, Justice tells anybody who will listen he wants to bring a

U.S. Open to the new course. The idea seems improbable. Stories like the one at Chambers Bay, which opened in 2007 and hosted a U.S. Open in 2015, are anomalies. But quality turf can satisfy anybody agreeable to something different. Just ask the PGA Tour and Saints.

“You have to realize whether the Tour is coming or the Saints are coming, if something goes wrong with it, you are on the firing line. It all points back to you,” Shumate says. “The Saints could have come here and done all their stuff, but if the fields weren’t good, they wouldn’t have wanted to come back or they would have had to leave and go somewhere else. The same way with the Tour. They are not going to want to come to a facility and put it on TV if it’s not what they are wanting to show. That’s a lot of pressure, but I think the people in this business whether it be sports turf or golf course maintenance, they have a level of pride and they strive for the same thing. They want the best field or the best golf course they can possibly make.” GCI

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# JACK IS BACK!



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

**T**o me, spring is synonymous with Jack Nicklaus. It has been 30 years since television announcer Vern Lundquist emphatically declared, "yes, sir" when the 46-year-old Golden Bear showed the golf world that hibernation was not in his vernacular as he roared back to win the 1986 Masters in what might have been the most exciting major championship of all time. The greatest golfer to ever play the game still had the magic touch and proved it to the world that memorable Sunday.

Many others have done this already, but I feel it's time I give Jack his due -- as a spokesperson for the game, award-winning citizen, golf course architect and the countless other ways he loves the game.

So yes, "Jack is back," but to be honest, he never went anywhere.

Start with the annual Memorial Tournament, which he created on a course he designed. Every year, great golfers of the past are honored at the event, showing his great respect for the game's history and traditions. It's the next best thing to Augusta as a reminder of golf's past. There's at least one other comparison between the Masters and the Memorial. When Jack won the '86 Masters, his last major, it was Paul Latshaw Sr. who oversaw preparations at Augusta National; today, son Paul Latshaw Jr. carries on his father's legacy by doing agronomic duties at Muirfield Village.

Like many of you, I've watched Jack since I was a boy. The first time we met was in 1985 on a construction site at Dallas Athletic Club, where he won his first PGA Championship (1963). I was merely the "designated driver" for Jack as he prepared an architectural renovation of that great course. He was larger than life to me, and I was amazed at what he saw, how he looked at things on and around the course. Three years later, when I met him again during the U.S. Open at The Country Club, I was astounded—and pleased—that he remembered me from that passing visit. I was a fan of Jack from that moment on.

While Jack and I may not see eye to eye on all matters golf—such as rolling back the golf ball or the need for 8,000-yard golf courses—I admire him in many ways. My list just scratches the surface of what he means to the game; I'm sure you can think of a few more qualities I've missed.

Longevity. Now 76, he is still a presence, an influencer and a force in our business. He also donates lots of time and effort to charitable causes, and, not coincidentally, was awarded the U.S. Congressional Medal of Honor in 2015.

He is an advocate for all things golf, looking out for players at his level—and my level, as well. He's not shy about stating his opinion, which was evident at the Masters this year when, once again, he called for the governing bodies to roll back the golf ball. While we might not agree on the how, Jack and I both feel

the game has become too much about distance, which has a particularly negative effect on our business.

As a golf course designer, Jack takes risks, receives criticism, and oversees a successful business and a vast empire of products. The Nicklaus courses I've played are consistently well designed, challenging, and if you can hit a high fade, you're going to score well.

Nicklaus Design has more than 390 courses open for play in 41 countries and 39 states; of those, Jack himself has been involved in 290. No fewer than 140 Nicklaus Design courses have hosted a combined total of more than 900 professional or significant amateur tournaments worldwide. The firm currently has more than 45 golf courses under development in 19 countries.

Jack also has been an innovator in design. Realizing that he had to test the best players in the world, he decided to make sand bunkers true hazards by furrowing the sand to create more challenge.

Back in 1991, when I was readying Pebble Beach for the following year's U.S. Open, Jack came out to offer his perspective as player and architect. He still had his notes from victories in both the 1961 U.S. Amateur and 1972 U.S. Open, as well as the 1982 U.S. Open, to guide us. Jack set the tone in getting the course "Open-ready," one more example of how he gives generously back to golf.

He's the ultimate sportsman. Who can forget the putt he conceded to Tony Jacklin at the 1969 Ryder Cup at Royal Birkdale, allowing that event to end in a tie? Or his graciousness in defeat? Jack won 18 major championships, but he also finished second 19 times! And never complained, made excuses or was anything other than magnanimous in defeat.

Husband, father, grandfather are likely his favorite roles these days. And the man loves his ice cream ([www.jacknicklausicecream.com](http://www.jacknicklausicecream.com)). Check out the triple chocolate. Yes, sir! **GCI**



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by  
Rob Thomas

Liquid nutrients provide superintendents with the means to manage the complex turf systems that make up the average golf course. But are these tools the ultimate turf performance solution?

**W**hen it comes to maintaining healthy turfgrass, superintendents are often forced to make a basic, but very important, choice ... control versus convenience. Does the control of spoon feeding liquid nutrients into the turf outweigh the convenience of slow-release granular products?

Quick- and slow-release granular products are effective management tools, especially under less intensive management, says William Kreuser, assistant professor of agronomy and horticulture at the Universi-

ty of Nebraska-Lincoln, but Mother Nature and ever-changing turf needs make spoon feeding a more effective option.

"A management goal for a highly maintained turfgrass system is to sustain consistent turf performance throughout the entire growing season," Kreuser says. "Nitrogen availability typically has the greatest impact on turf performance including color, density and traffic tolerance. Unfortunately, the nitrogen cycle is extremely dynamic and complex. This makes it difficult to sustain even nitrogen availability."

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tilizer sources, he says. These products, such as clean urea or ammonium sulfate, are easily dissolved and sprayed on highly maintained turfgrass.

"This allows managers to be very flexible with application rates depending on what the turfgrass needs," Kreuser says. "It also means that the fertilizer will be immediately available for nutrient uptake. Superintendents who successfully use liquid spoon feeding of nutrients constantly assess the quality and performance of their turf and tweak fertilizer application rates and frequencies to sustain consistent performance and quality."

Ultimately, foliar quick-release nutrients gives turfgrass managers the greatest amount of control, Kreuser says.

Turf researcher Doug Sol-

ulating potassium levels in leaf tissue. Sometimes you want it above 2 percent, other times there are benefits to having it around 1.5 percent or lower. These manipulations are best done by spoon feeding potassium fertilizer, rather than attempting to adjust soil potassium levels.

Soldat doesn't believe there are any special benefits to foliar uptake, in particular.

"You sometimes hear that there are situations where roots aren't functioning and foliar uptake then becomes an important pathway for assimilating nutrients," he says. "However, if your roots are truly non-functional, then you have other problems (like water uptake) and your plant won't live. Roots evolved to take up nutrients, while leaves evolved to

“Every time we make an application to our turfgrass we introduce the small chance of an application error or mistake. They can be large and acute, like a hose blows on a sprayer and dumps a lot of mix directly into the environment, or small and chronic, like some fertilizer drift off-site and off-target if it is too windy.”

— William Kreuser, University of Nebraska-Lincoln

dat likes the practice of spoon feeding because it provides so much control.

"If the turf looks green, you can leave the nitrogen out of the tank ... If it looks hungry, you can add a bit more than you normally do," says Soldat, an associate turfgrass professor at the University of Wisconsin-Madison's Department of Soil Sciences. "We are learning that there are advantages to manip-

keep liquid out. So while I prefer liquid feeding in most cases, I don't get hung up on getting my nutrients in through the leaves rather than the roots. That said, if you are interested in getting the nutrients in the plant through the leaves, use a small spray volume, a urea based nitrogen source, and a product that contains an adjuvant to spread the solution out along the leaf."

## Getting it right

Today's liquid nutrition is safe for the environment and more efficient than its predecessors, but is there anything lacking? The real question is, "What isn't lacking?" asks William Kreuser, assistant professor of agronomy and horticulture at the University of Nebraska-Lincoln.

"Foliar fertilizer programs have gotten too complex and too pre-programmed," he says. "While all essential plant nutrients are required, not all are required to be in a foliar, spoon-feeding program. Nitrogen is important because its season-long availability cannot be easily measured or estimated with an annual soil test. Fortunately, turf is very responsive to nitrogen fertilization. That means a turf manager's eyes are the best tools to estimate fertilizer need. For other nutrients, consult MLSN guidelines to determine if other nutrients are required.

"The bottom line, if a nutrient doesn't exhibit some type of response, I would very carefully consider if it is required," Kreuser adds. "Nutrients like calcium and magnesium, for example, are rarely, if ever, required."

Shaddox agrees adding liquid nutritional products have more components than are needed. "The products could be made less expensive and produce essentially the same results if unnecessary elements were removed," he says. "So, in my opinion, nothing is lacking overall. However, some products do not mix well with others depending entirely upon the manufacturing process and raw materials used. So if anything can be added, I would recommend increasing the compatibility and stability with other elements."

As for the future of liquid nutrition, Soldat doesn't believe the industry is missing any technologies in liquid nutrition. However, the industry needs to continue to improve its understanding of the minimum levels of nutrients in the leaf and the soil that turfgrass requires. "This will allow us to maximize our efficiency when it comes to fertilizer applications," he says.

Turf scholar Travis Shaddox sees a possible expansion in what's targeted.

"Most product evolutions involve the addition of other components intended to resolve secondary issues," says Shaddox, an assistant professor at the University of Florida/IFAS Fort Lauderdale Research and Education Center. "So in the past, where a single product resolved a single issue, now that product may be able to address multiple issues. For example, a single source iron product may now be blended with manganese and zinc."

Shaddox also believes there will be better chelates. "Manufactures tend to use chelating agents that allow for better blending of metals in the solution, but those same chelates (such as glucoheptonate) do not necessarily lead to greater soil solubility," he says.

"The percent guaranteed analysis is often limited by the saturation point of a given metal in solution," he continues. "The percentage can be increased using different chelates. Generally, as the percent of element in solution increases, the cost per acre to the end user decreases since less of the material is required to apply the same amount of element."

Kreuser looks to another area of golf course maintenance for a glimpse at the possible future of fertilizers.

"Like much of turf management, I think we'll start using more data to guide fertility management," he said. "We are already doing this with TDR probes to guide irrigation and hand-watering. I also think we'll see a simplification in fertilizer sources and spoon-feeding programs."

Foliar applications, though, have many advantages.

"First, the approach provides turf managers greater control over nutrients applied," says Travis Shaddox, assistant professor at the University of Florida/IFAS Fort Lauderdale Research and Education Center. He focuses on soil fertility and turfgrass nutrition with a strong emphasis on granular and liquid fertilizers, in his research. "Environmental conditions may vary greatly after nutrients are applied - ie. excessive rainfall events, etc. Foliar programs allow for a more rapid reaction and greater flexibility to offset unfavorable environmental conditions.

In addition, foliar applications greatly increase the application accuracy, especially when very low quantities are needed, Shaddox says. "Nutrient rates of 0.1 to 0.25 lbs. of an element are commonly applied. This would be very difficult to accurately apply using granular nutrients," he says.

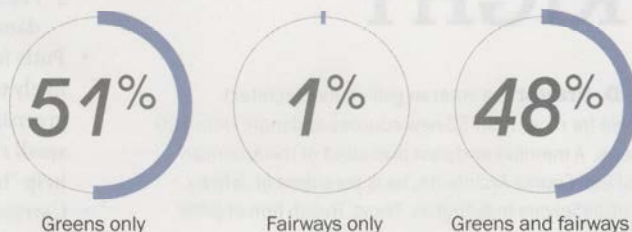
Lastly, Shaddox adds "application uniformity" for the same reasons listed in above.

Today's practices are not only good for the quality of the turfgrass, but there are environmental benefits, as well. Precision nutrition, as Shaddox terms it, may have a positive environmental impact by reducing the total amount of nutrients required, since those nutrients are often more efficiently utilized by turfgrass systems.

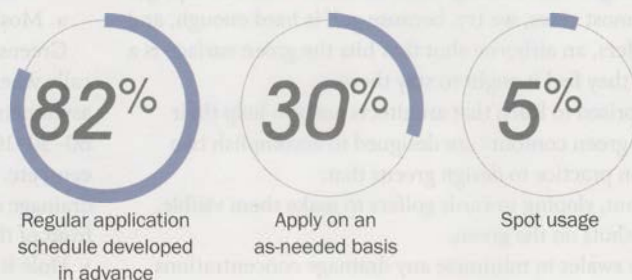
Weather comes into play, too, Soldat says. "Spoon feeding ensures that there isn't an excess of nutrients in the soil to wash away if a heavy rain event occurs," he says. "The small doses applied by spoon feeding are taken up in a matter of hours, not days."

## Just the facts

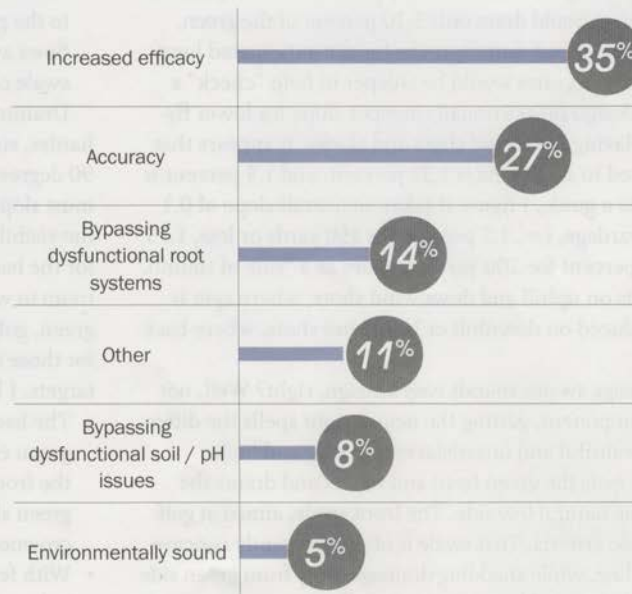
### Where do you use foliar fertilizers?



### How do you use foliar fertilizers?



### What is the biggest advantage of foliar fertilizers?



Application of low rates of soluble fertilizers have a positive environmental impact because the low applicate rate reduces the risk of nutrient loss when large applications of nutrients are applied at one time, Kreuser says. He adds another benefit is that the risk of removal during mowing is greatly minimized compared to granular products. The collection of these fertilizer prills during mowing and subsequent clipping piles increase the risk of nutrient leaching.

There are environmental concerns to consider, however.

"The risk of an application mistake would be magnified when more applications are required over the year," Kreuser says. "Every time we make an application to our turfgrass we introduce the small chance of an application error or mistake. They can be large and acute, like a hose blows on a sprayer and dumps a lot of mix directly into the environment, or small and chronic, like some fertilizer drift off-site and off-target if it is too windy."

Human error is the main worry, Shaddox says.

"Theoretically, any concerns are insignificant since there is overwhelming evidence that foliar nutrition is more efficient and less wasteful than a normal granular program," he says. "However, in practice, humans make mistakes, storage and handling can create issues, and spills can occur. As long as the products are shipped, handled, stored and applied appropriately, foliar nutrient applications to turfgrass are very safe." GCI

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

# GETTING BACK-TO-FRONT GREEN SLOPE RIGHT



**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](mailto:jeff@jeffreydbrauer.com).

A common golfers' complaint is that "the green didn't hold." Architects put a lot of thought into making them hold, but don't always get them right. In most cases, we try, because golf is hard enough, and for average golfers, an airborne shot that hits the green surface is a good shot, and they feel it ought to stay there.

Most golfers would be surprised to learn that architects want to help their game, and that 90 percent of green contours are designed to accomplish two basic things. It's very common practice to design greens that:

1. Are higher in back than front, sloping towards golfers to make them visible, and assist in holding their shots on the green.
2. Have two distinct drainage swales to minimize any drainage concentrations that could cause wet spots and turf damage to the green surrounds.

There are exceptions to the two swale "rule" of course. Small greens can usually drain one way and large greens, especially those with three distinct tiers should have three drainage swales off the green, so upper tiers don't drain onto lower ones. However, on mid-size greens, three swales often create a "crown" near the middle of the green that rejects shots in a very player unfriendly manner. On mid-size greens, third swales should drain only 5-10 percent of the green.

In the old days, many long holes had flatter greens for the anticipated long iron running approach, while short ones would be steeper to help "check" a short iron. Now, we tend to design proportionally steeper slope for lower flying, longer approach shots. Having measured shots and slopes, it appears that the minimum upslope required to stop shots is 1.33 percent, and 1.5 percent is the minimum for drainage. As a guide, I figure it takes an overall slope of 0.1 percent per likely approach yardage, i.e., 1.5 percent for 150 yards or less, 1.75 percent for 175 yards, and 2 percent for 200 yards or more as a "rule of thumb." This is often adjusted upwards on uphill and downwind shots, where spin is reduced, and occasionally reduced on downhill or headwind shots, where back-spin naturally increases.

Designing two simple drainage swales sounds easy enough, right? Well, not always. As with any design component, getting the details right spells the difference between practical and beautiful and unsatisfactory in play and look.

One drainage swale usually exits the green front and the second drains the back portion of the green to the natural low side. The front swale, aimed at golfers, naturally handles both basic criteria. That swale is often also gently concave to help hold shots drifting off line, while shedding drainage away from green side bunkers. The front drainage swale should slope towards golfers:

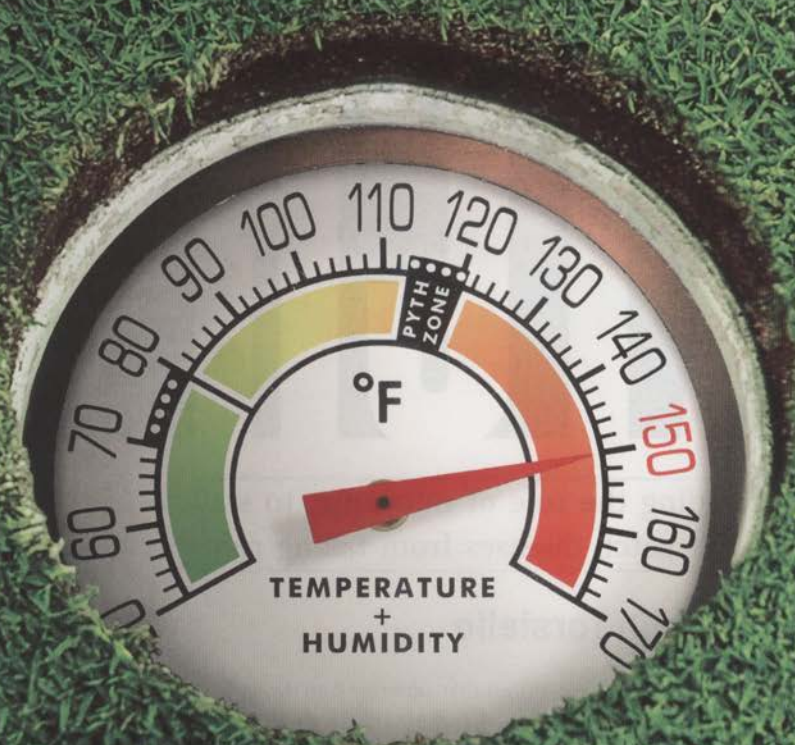
- As gently as possible, near the 1.5 percent minimum required for drainage,

since:

- Most shots land (and ball marks occur) in the green's front third to half.
- Flatter slopes reduce ball mark damage.
- Putts from above the hole are less likely to be "de-greened." On tiered greens, some architects even put a small ridge in front of the green to help "hold" severe downhill putts.
- Carrying less than 50 percent of the green, since:
  - Many mowers turn around in the approach,
  - Many sets of sprinklers often overwater it, and
  - Most golfers walk through it.
 Greens are usually better aesthetically when green drainage areas are asymmetrical, divided 60-40 percent, 60-30-10 percent, 50-40-10 percent, etc. In some situations, more drainage should be directed off the front of the green when:
  - Hole is uphill, promoting better visibility if the swale aims right at golfers.
  - Backing mounds shed large flows on the back of the green,
  - The back of the green drains towards the cart parking/access route to the green. If drainage naturally flows away from traffic, the back swale can drain more area.
 Draining the back of the green is harder, since the slope drains at about 90 degrees to the line of play, but still must slope toward golfers to provide the visibility/shot holding functions for the back of the green. With less room to work with at the back of the green, golfers need even more help for those tighter back "Sunday Pin" targets. I have found:
  - The back swale should exit the green edge about a foot higher than the front one, to keep the entire green sloping uphill, and to prevent crowned greens.
  - With fewer shots landing above the hole, green backs can slope more than the front, from 2-3 percent. GCI

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# COVERING PATCH

Key strategies, including the role of nutrients, to stay ahead of and prohibit patch diseases from taking root.

by **John Torsiello**

**P**atch diseases are nasty, bothersome and costly turf marauders that create headaches regardless of where the course is located.

In fact, patch diseases are the most troublesome of the turf diseases because not only are they unsightly, but they can completely kill turf. And incidents may be on the rise.

"We have seen in many areas an increase in patch diseases," says Dr. Jason Fausey, director, technical services T&O for Nufarm Americas. "In recent years, trends towards warmer temperatures with unpredictable dry weather, followed by heavy rainfalls have contributed to this increase. Each patch disease is unique and has a specific set of ideal environmental

conditions that allow for it to thrive."

Patch diseases are so destructive because the fungal pathogens infect the turf's crown and root systems. "Without healthy roots and crowns the turf plants can be killed or function poorly, especially when placed under environmental stresses, such as summer heat in the case of cool-season grasses," says Dr. Joseph Rimelspach, program specialist in The Ohio State University Turfgrass Pathology Program. "In years where there has been increased stress on growing turfgrass, these diseases have increased."

According to Rimelspach, this stress includes both very hot conditions for cool-season grasses in summer and periods of excessive rainfall and/or long periods

An aggressive example of take-all patch, which is most commonly associated with bentgrasses.

## FOR MORE . . .

The Ohio State University Turfgrass Pathology Program has a fungicide chart that gives information about fungicide mobility. Visit [turf.disease.osu.edu](http://turf.disease.osu.edu) under Fungicide Chart, Families of Fungicides for Turfgrass, or enter [bit.ly/25NRVJ](http://bit.ly/25NRVJ) into your browser.



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of wet root zone conditions. "You may want to consider what areas of the country have different grasses (susceptible to different diseases) and what areas of the country experience stressful environmental conditions that could lead to more diseases," he says. Regions with extreme weather may be more susceptible to patch diseases.

"This winter was mild in many locations, Fausey says. "Superintendents need to be cautious, as soil temperature and disease development were on the rise earlier than normal."

Count on an appearance of summer patch and take-all patch every summer, but the severity of the summer will

largely determine the level of turf damage, says Dr. Zac Reicher, technical specialist, Bayer Green Solutions Team. "Since it is a root-infecting disease, summer heat and drought stress will enhance the symptoms of summer patch on annual bluegrass, as well as take-all in creeping bentgrass," he says. "Take-all also infects roots, but symptoms often diminish with summer temperatures because of reduced growth of the pathogen, only to reoccur in the early fall."

#### GETTING IT UNDER CONTROL

To successfully manage patch diseases, Rimelspach says it's key for superintendents to

## BE ON THE LOOKOUT

Turf managers must be on the lookout for several types of patch diseases.

**Dead spot** Primarily goes after young stands of creeping bentgrass or Bermudagrass

**Spring dead spot** Mostly a problem on Bermudagrass

**Necrotic ring spot** Plagues Kentucky bluegrass, and in rare cases confirmed on fescues and *Poa annua*

**Summer patch** A problem on *Poa annua* and fine-leaf fescues

**Take-all patch** Most commonly associated with bentgrasses, and in rare cases confirmed on fescues and *Poa*.

maintain detailed records of past outbreaks with accurate diagnosis of the specific patch disease(s) they faced. "If you have had patch diseases, early pre-symptom applications of effective fungicides with proper

placement are critical," he says.

Soil temperatures often dictate application timing. For example, consider summer patch in *Poa annua*. Reimeplsach advises a first application of fungicide when soil temperatures



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are at 65 degrees, at a 2 to 3-inch depth, for two to three consecutive days. Apply the fungicide in a sufficient volume of water to move the product to the crowns and upper roots (this is assuming the fungicide is upward systemic, which most are that are used to treat patch diseases). In many cases, 4 to 5 gallons of water per 1,000 square feet is recommended. Light watering to move the product into the surface can be done before the product dries. But, often irrigation systems deliver uneven amounts of water, and it is not wise to dilute fungicide to the point of an ineffective rate.

Curative measures depend on how far the disease has progressed in the plant if such steps will bear fruit... so to speak, says Dr. Joseph Vargas, a professor in the Michigan State University Department of Plant, Soil and Microbial Sciences.

"If it has already entered the crown of the plant, it is too late," Vargas says. "But, on the other hand, if you catch it early enough, or if the crowns of all the plants have not been infected, curative fungicide applications can prevent further damage."

The only way to stay ahead of patch diseases is to follow preventative programs outlined by regional turfgrass pathologist or extension specialist, says Dr. James Kerns, an assistant professor and extension specialist of turfgrass pathology at North Carolina State University.

Kerns recommends monitoring soil temperatures (at a 2-inch depth) and make the initial fungicide applications when the temperatures are consistently (four or five days) at certain temperatures (take-all patch in cool-season turf between 55 and 65 degrees, summer patch 65 degrees and above, spring dead spot 70 degrees in autumn, take-all rot in warm season grasses 75 degrees or higher). "For example, for take-all patch of creeping bentgrass the first application should occur when soil temperatures reach 55 degrees for four or five consecutive days," Kerns says. "A second application 28 days apart should be sufficient unless soil temperatures remain below 65 degrees after the second application."

Summer patch is now better understood and two well-placed fungicide applications 28 days apart starting when 2-inch soil

temperatures average 65 degrees are usually effective. Says Reicher, "Most effective products tend to be the DMI fungicides (Bayleton, Tartan, Mirage, Banner, etc.), and a third application may be justified on

areas with a history of damage." Control of take-all can be effective with DMI or QoI fungicides, but timing is earlier in the spring when average soil temperatures are 55 degrees-plus, with a second application

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## DISEASE

three to four weeks later, and a fall application when average soil temperatures return to 45 to 60 degrees. Since fungicides need to be soil-applied to be effective, apply in 2 to 5 gallons water per 1,000 square feet and water in with 0.1-inch of water immediately after application.

### RECOVERY

Recovery is typically slow because injury has occurred during warm weather. "Fungicides, such as azoxystrobin and thiophanate-methyl, can be curatively applied, but need to be watered in to the turf profile," Vargas says. "The DMI chemistry can be effective in managing the patch diseases preventively, but, because of their PGR effects, should not be used curatively. It is also important to foliar feed the infected plants nutrition to help them recover, since the root systems have been severely damaged."

Adequate and proper fertilization is essential for healthy turf and a must to manage and hopefully prevent these diseases, Rimelspach says. Timing is also important, so that growth is promoted at the proper time for the turf species. In addition, "minor elements" need to be monitored, especially for some patch diseases.

"An example is that take-all patch is greatly increased if there is a deficiency in manganese," Rimelspach says. "Make sure you have a good working relationship with a reputable soil testing lab and/or consultant."

Fausey adds proper nutrient management along with pH balance, fertilizer type and timing all become very important when managing patch diseases, especially in "trouble areas" where these diseases have oc-



curred in the past.

Soil nutrients can certainly impact patch diseases. "Avoiding high nitrogen fertilization is important when conditions favor brown patch," Silcox says. "Low nitrogen fertility will favor brown ring patch damage. Large patch of zoysiagrass may be enhanced by nitrogen applications during September or in the spring when the disease is active. Summer patch can be enhanced by nitrate-based fertilizers, so acidifying fertilizers should be used as nitrogen sources." Nitrate-based fertilizers may also enhance take-all patch and adequate levels of potash and phosphate will help minimize this disease. Fall applications of nitrogen should

help turf outgrow symptoms of yellow patch the following spring.

### DON'T FALL BEHIND

Patch diseases are extremely visible and sometimes destructive, so extreme responses typically happen when these diseases develop, Kerns says. It is best to make sure the disease is diagnosed and work systematically to alleviate the damage. "A reactive approach with these diseases can result in further damage and result is wasted applications," he says. "The key is to work with your local turfgrass faculty to help you with these diseases."

Dr. Rimelspach sums up the situation, "Have an accurate

Top: Brown patch; Left: Summer patch. The best way to stay ahead of patch diseases is to follow preventative programs outlined by regional turfgrass pathologists or extension specialists.

diagnosis of problems. Stay ahead of the game. Once you see symptoms you are behind. If the summer is long and brutal, additional applications will be needed to protect the turf and minimize infection. Have a good plan in place and adjust depending upon weather conditions and the performance of the turfgrass."

Vigilant monitoring, good record keeping to fall back upon, consultation from diagnostic professionals, feeding your soil to insure its health and resistance capabilities, and a well-thought-out and effective plan to quickly put in place if problems occur are vital to keeping your turfgrass free of patch diseases this year and in the future. **GCI**

*John Torsiello is a turf writer based in Torrington, Conn., and is a frequent GCI contributor.*



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# SIMPLE AND EFFECTIVE



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

**I** find irrigation systems exciting. But even for people like myself, quick-couple valves – or snap valves – are some of the most unexciting components of an irrigation system. You may remember the old days when the whole fairway system, or even the whole irrigation system, was comprised of quick-coupling valves and your night waterer ran around all night plugging impact sprinklers, threaded onto the key, in and out of the quick coupler. This was not only time consuming, but dangerous. Unfortunately, this is still the irrigation system some courses have today to water their fairways.

Quick couplers are an important component of any golf course irrigation system. They provide a water source to syringe greens by hand, hit hot spots, water annuals, fill spray tanks and wash off cart paths. The number of quick couplers varies depending on the superintendent's wishes, amount of labor available and original installation budget. High-end courses will have a minimum of two quick couplers per green, two or more per tee group on each hole depending on the number of tees and on a set spacing in the fairways. Large greens may have three or more quick couplers. This adds up to a substantial number of quick couplers on an 18-hole course, often totaling more than 200 couplers. Take into account the cost of the quick coupler, the swing joint, the tap off the piping and maybe a valve box, and couplers are a significant cost component of the irrigation system.

Quick couplers are still a simple, maintenance-free product. However, they are dangerous and when inserting the key or disengaging it, you can pretty much guarantee you will get wet. You can tell when you're dealing with someone accustomed to using quick couplers because their body and face are never directly over the quick coupler. When not properly installed, quick couplers can spin off the swing joint when trying to engage or disengage the key. On older systems, quick couplers were installed on galvanized swing joints so the quick coupler would not turn, but the swing joint would corrode with time. Today quick couplers are mounted on brass swing joints or prefabricated PVC swing joints with brass inserts to prevent them from spinning off. They also can have wings cast to the body as part of the quick coupler by the manufacturer to stabilize them. You can purchase third party stabilizers that attach to the quick coupler.

While the concept has been around for 40 years, the best innovation in quick couplers is an ACME thread on the key as opposed to a lug. The ACME-type quick couplers have a few advantages. One, is the key threads in and out of the body, engaging and disengaging slowly and as such does not spit water at you. Two, the threaded design allows you to throttle the key – it doesn't have to be all or nothing to get water. It is a much safer valve especially on high-pressure systems. The only downside to ACME-threaded quick couplers is some super-

intendents believe they provide less water flow, so they feel it takes longer to syringe a green.

Labor plays a part in quantities. If you don't have enough staff to hand water fairways, installing quick couplers in fairways doesn't make a lot of sense. Superintendents also have a tendency to have quick couplers installed on new systems where they have encountered dry or hot spots. A new system often remedies those areas.

While locations vary, a quick coupler's primary purposes on a green is to supply water if for some reason the system around the green is out of commission due to a leak or other malfunction. A quick coupler is installed before the isolation valve for the green so water is available if the green has to be isolated. The other location on the green is usually opposite the one at the isolation valve so there is always at least one live quick coupler. Because green quick couplers are used to hand water, it makes sense to have the quick coupler close so you do not waste a lot of hose length just getting to the green – 10 to 15 feet away is ideal. At greens, quick couplers are usually installed close to a green sprinkler and the isolation valve so they can be easily located.

On tees, quick couplers are located close to the tees either before or after the isolation valve(s) or a combination of the two. Ideally, all the tees can be reached from a quick coupler with the length of hose used by the golf course. The quick couplers for tees may be installed in valve boxes so they can be easily located. Fairway quick couplers are found in different location configurations. Some superintendents like them along the mainline before the isolation valves, others in the middle of the fairway beside a sprinkler while others like them alternating across the fairway from one side to the other. Fairway quick couplers, other than when located in the middle of the fairway, are commonly installed in valve boxes so they can be easily located. **GC**

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# Spring

INTO

# ACTION

A good start positions you for success throughout the year. Set the tone and create the right atmosphere for a successful season ahead.

by **Bruce Williams**



Spring brings the advent of snowbirds returning from the South and the onset of the golfing season ahead. Many courses are going from a dormant winter set of grasses to the beginning of the mowing season and spring green up. As our staffs return, it is a time for a renewal of commitment and energy to create the product necessary to meet golfers' expectations.

For those who have a seasonal staff, it is not uncommon that those crew members may have forgotten some of the good habits learned over the years and maybe have picked up a few bad habits in their off time. In an effort to prevent this from happening, it is best to go over a several items upon return to the job. See if some or all of these refreshers might benefit your operation.

#### WARM UPS

When your staff returns from their hiatus, it might be beneficial to consider having them do a few exercises to be ready for the physical work they will be involved in. Several superintendents use exercise not only for returning staff, but also as a daily practice. This might include stretching or even a few yoga practices. This has been looked upon favorably by some insurance companies as a method to reduce workplace injury. Start it this spring and make it a part of your daily program. It could be the best 5-minute jumpstart to everyone's day to get the muscles and joints working along with proper blood flow.

#### INTRODUCTIONS

Each new golf season brings new faces to the golf course operations department. A great idea is to take a little time to have the new employees meet the returning staff. This can be done as simply as a meet-and-

greet over coffee and donuts that first week back. A better way to do it is for the superintendent or assistant superintendent to give a quick biography on returning employees and then do the same for the new hires. Keep it short and to the point with the number of years they have been employed and emphasize what their typical job functions are at the golf facility.

#### GOALS AND PLANS FOR 18 HOLES

There is no doubt superintendents spend a good part of their winter developing plans for the golfing and growing season ahead. There is no better time than the spring to share those plans with your staff.

A staff likes to be well informed. Good leaders do this.

- What projects do you have planned for the year ahead?
- What are the goals of the department for the year ahead?
- Revisit any mistakes that might have been made the prior year and indicate what

will be done to ensure there is no repeat.

- Ask for feedback from staff on what can make the facility and department better?

#### TRAINING

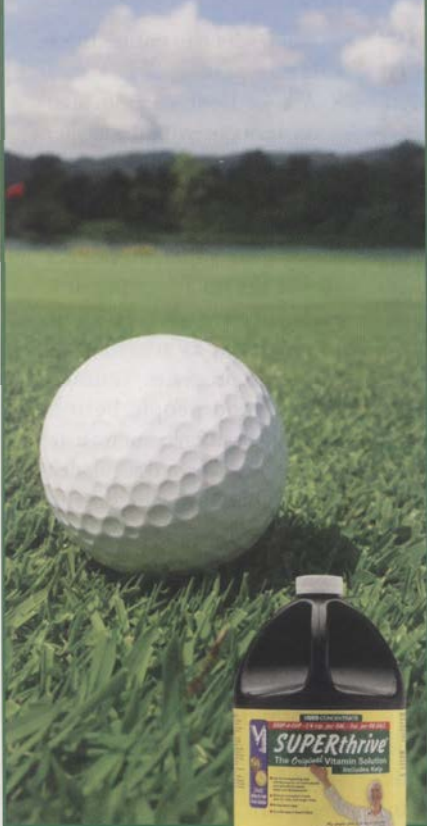
Every year superintendents should set up a training program for their staff. It is just as important as a fertility or fungicide program. Training makes good people better. Training positions your team to reduce mistakes and accidents. Training allows your staff to learn new skills and potentially take on new assignments in the workplace.

For those who don't have a training program, the best way to start is to utilize professionally produced videos on a variety of topics. The first three I would recommend are important.

- **This is a Golf Course.** Remember, many people have never played golf and need to understand the workplace and the product they are asked to provide.
- **Safety Basics on the Golf Course.** Avoid injuries and reduce workmen's compensation claims.
- **Crew Etiquette.** New employees need to learn this and returning employees need to remember this. Supervisors can't be working with every employee every minute of the day, so a short video reminds people about how to act and how it impacts the golfers we work for.
- There are a variety of the above videos and others produced under the brand of Superintendents Video Workshop and available from Epic Creative.
- While they are not always specific to golf, you can find

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## BUSINESS MANAGEMENT

videos on YouTube about preventing back injuries, heatstroke, chainsaw operation, etc.

### REQUIRED BY LAW

Almost every state has laws requiring annual training for hazard communications. The general idea is employees have a "right to know" about any workplace hazards. It is doubtful that if an employee was given this training a decade ago that it would still stand. Again, most states require an annual review of the laws and regulations in this area. There is no better time to do this training than each spring. Surely there are days with frost that might not permit workers to go outside on the course. Between early season frost delays and a few rainy days, there is no better time than to incorporate this into your training.

A couple of things that would fit into training, in addition to HazCom would be:

- Building emergency exits
- Location of fire extinguishers
- Disaster preparedness
- Automatic Electric Defibrillator training
- CPR training
- First aid
- Proper storage
- Respirator fit

### SPRING CLEANING

It is the time of the year to be sure your workplace is clean, safe and comfortable to work in. If the winter did not allow you time to put a fresh coat of paint on the walls or power wash the floors, then now is the time to do it while you have ramped up your staff. Change out the furnace filters and clean out the irrigation controller boxes in the field. Clean the strainer on your wet well or irrigation input basket.

How about those files in your file cabinets? Are they current and what items do you keep and which ones do you dispose of? The same can be true for your computer. Are there any electronic files that you need to purge or organize in specific files?

It is highly likely that there won't be a lot of extra time for these items once the golfing season is in full swing. Make a list of all you need to do and check them off as you complete them. Use that list as a

## So, what did you do this winter?

Most superintendents get tired of answering that question by the time winter is over. The best example of demonstrating what took place in the winter was done by John Ebel at Barrington Hills Country Club in the Chicago area. Each and every year John would host an open house at his maintenance facility. He invited all club members to stop by during a several hour period toward the end of March. John took great pride in how his team had refurbished the equipment over the winter. All of his equipment was put on display and many of the pieces had a poster board describing the purchase date of the equipment and the current replacement cost. This was a nice soft sell for keeping staff on in the winter as well as eliminating any question about how well the equipment was taken care of. John never had much of a problem when he asked for new equipment either.

It is nice to have a goal. Winter months can be dreary for people that are used to being outside. However, when you know that your turf care center will be having an open house to put your work on display, it becomes a worthy challenge to get it all done by the time the snowbirds return.

template and repeat it each year.

### SHOW ME A SIGN

Every golf course wants a superintendent that has attention to detail. Part of that detail is making sure that golf course appurtenances and signage are freshly painted, crisp and clean. Start off each spring with new signs if you can afford them. If not, then clean up the old ones and paint them. Other accessories are ropes, stakes, ball washers, yardage markers, waste receptacles, flagpoles, cups, hole liners, etc. Think of it as having everything look as good as it does for your biggest tournament when the golfing season starts. **GCI**

Bruce Williams is GCI's senior contributing editor.

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By Mickey McCord

Teach your new recruits to work safely around golfers and how not to interfere with play.

# Basic training



One of the most challenging aspects of being a golf course superintendent is the seasonal nature of the work and retaining experienced staff members. Almost every new season means recruiting, hiring and training new employees. Often these new hires have never been on a golf course.

One of the hazards they will face almost every day is getting hit by a golf ball. To help them work safely around golfers and not interfere with play, part of their training should include an orientation to golf and a basic understanding of golf etiquette.

Golf takes etiquette and safety very seriously. In fact, Section 1 in the Rules of Golf is Etiquette; Behavior on the

Course, and states "Players should always alert greenstaff nearby or ahead when they are about to make a stroke that may endanger them." That doesn't mean you can always count on a warning. Your new hires need to understand not all golfers are watching for them or will see them; they must take responsibility for their own safety and it's important they learn and follow the rules of golf etiquette.

Here are some highlights you'll want to make sure you cover when talking to your crew about golf etiquette and working around golfers.

Your crew may find themselves working very close to golfers, around a tee or on a putting green, or golfers may be hundreds of yards away playing a shot towards you. Either way,

“If they are attentive, and follow your instructions, it's unlikely a crew member will get hit by a golf shot, but they still need to know what to do in case someone is hit.”

to work safely and not interfere with play they need to follow these three simple rules:

1. Be quiet
2. Be still
3. Stay out of the line of play

Tell them the closer they are to the golfer, the more important these rules are. You don't have to stand still and be quiet all the time, but if you're working at a tee box, green or any other place a golfer is preparing to hit a shot, you must be absolutely quiet, and stay as still as a statue. Explain what "addressing the ball" means and how critical these last few seconds are to a golfer's concentration.

It's not as important to be perfectly still and silent if you're raking a fairway bunker 270 yards from the tee, but it is important to pay attention and know when golfers are approaching. As soon as you realize you're in range of a golf shot, stop working, give the golfer your attention and move out of their line of play. Remember golfers are optimistic and expect to hit every shot long and straight. They may believe they can reach you from unrealistic distances.

This is a good time to explain "line of play" and how far out of the line of play you want your crew when a golfer is playing in their direction. If they are working on a green while golfers are playing shots to that green, I suggest they move completely off and to the back of the green. On the other hand, if they are more than a hundred yards away in a fairway, it might be OK to just move 10 yards or so, one way or the other. While you're talking about line of play, demonstrate where they should stand if they

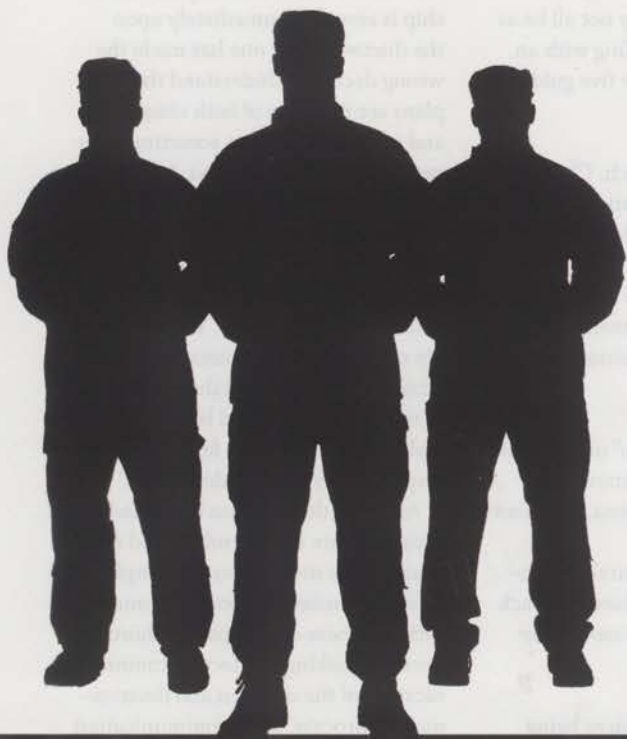
are close to a golfer hitting a shot or putting. For example, don't stand on the line of a putt.

Now back to the golfer playing a shot toward a worker. After they've moved out of the line of play, tell them to acknowledge the golfer with a friendly wave to let him know it's OK to play. Make sure they keep their eyes on the golfer and watch carefully for the ball. Explain that if a golfer yells "FORE!" He is not announcing his score. If the worker sees the ball he can easily move and avoid it, but if he hears "FORE!" and doesn't see the ball, he should turn his back to the golfer, duck, and cover the back of his head and neck with his hands and arms.

Some golf course jobs are more dangerous than others and put the worker directly in the line of play. There are some strategies you can use to help avoid golfers (starting early, working in reverse order, look for gaps in play), but most importantly they have to pay attention and be aware of what's going on around them.

If they follow your instructions, it's unlikely a crew member will get hit by a golf shot. But they still need to know what to do in case someone is hit. First, they should make a quick assessment and seek immediate help for any serious injury, especially if hit in the head, even if they believe they are okay. For less severe injuries, ice helps with swelling and minor pain relief. One final rule is never blame or interact negatively with golfers. If you feel you were treated unfairly, tell your supervisor and let them handle it. **GCI**

*Mickey McCord is the founder of McCord Golf Services and Safety, and is a frequent GCI contributor.*



# CROSSING THE RUBICON



**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.

**W**e use the phrase "crossing the Rubicon" to mean passing a point of no return, which is what Julius Caesar did in 49 BC, when he marched his army through the shallow river in northeastern Italy toward Rome. "Alea iacta est," Caesar said – the die is cast – meaning there would be no turning back or second guessing the decision.

Leaders are faced with important decisions every day. They may not all be as pivotal as Caesar's, but at times they are irreversible. When wrestling with an important decision, our experience shows the importance of these five guiding principles.

**1. DO YOUR HOMEWORK.** There is no substitute for thorough research. Club leadership is populated by those who often prefer to trust their instincts in favor of understanding market trends and best management practices. Many live to regret those hastily made decisions.

Due diligence involves understanding the factors that influence consumers to decide to become a member of a private club or even to pay a greens fee at a particular course. Market knowledge provides the insights to decisions effecting marketing, pricing and service issues.

**2. ESTABLISH INCREMENTAL TRIALS.** Test an idea before going "all-in" on changes that cannot be easily reversed. Every well-trained turf researcher knows the value of test plots – those small squares where variables in conditions, practices and applications are tried and monitored.

Make decisions that can be validated in a progressive and measurable manner. Incremental validation enables club leaders to develop organized feedback from members and customers through surveys, focus groups and one-on-one interviews.

**3. EXECUTE COST / BENEFIT ANALYSES.** Is it worth it to make the choices being considered? What are the economic possibilities and ramifications? Two tools that are often left in the decision-making shed are SWOT (strengths, weaknesses, opportunities and threats) and SOAR (strengths, opportunities, aspirations and results) analyses. These tools are often under-utilized because they require time and focus. But those who shoot first and ask questions later often find themselves shooting a hole in their foot.

Economic analysis is a fiduciary duty among disciplined professionals. One is expected to make thoroughly analyzed decisions.

**4. ASK THE QUESTION: "IS THIS THE RIGHT THING TO DO?"** Avoid making decisions that are expedient and inconsistent with vision and strategy. It's relatively easy to make decisions that involve low risk. Making good decisions when the stakes are high is the stuff of great leadership.

In golf, doing the right thing and doing it right separates top performers. Remember the advice of Jim James at Augusta National Golf Club: "We look at every single day as an opportunity to improve. When we find we are not the best, we are relentless and incredibly focused to make sure that we improve."

**5. PLAN FOR "PLAN B".** Always have a back-up plan to protect the club's reputation and its brand. Suspect leadership is revealed immediately upon the discovery that one has made the wrong decision. Understand that all plans are made up of both constants and variables, and that sometimes the variables work against you. In such cases, be prepared with options.

Remember that General Dwight Eisenhower kept a hand-written note in his pocket throughout the D-Day invasion ... just in case. The note simply stated that the soldiers, sailors and airmen had performed their duties to the fullest that could be expected and that any blame for failure was his responsibility and his alone.

After the decision has been made, communicate it to members and customers. The most common complaint by club members is about communications. These days, a part of thorough decision-making is effective communication of the decision and decision-making process. Such communication must be clear, redundant and issued through multiple channels.

Understand that some decisions go wrong. Even some of the ones that were well researched, tested and conscientiously made. Leaders own their decisions — even the ones that go awry — and they soldier onward. **GCI**

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# RESISTANCE IS FUTILE

**FUNGICIDE RESISTANCE ISSUES ARE NOT UNCOMMON. HOWEVER, REGULAR PRODUCT ROTATION KEEPS PROGRAMS POTENT AND TURF DISEASE UNDER CONTROL.**

**F**ungicides are important tools in a superintendent's efforts against a wide variety of disease that plague turf, interfere with play, and test superintendent job security.

Golf Course Industry, in partnership with AMVAC Chemical Corp., recently surveyed golf course superintendents, via the online research survey portal SurveyMonkey, about their experiences with fungicide resistance issue. Most importantly, how they dealt with these issues and the steps they take to keep their programs effective. In addition, we further delved into this issue by closely examining how a trio of

diverse superintendents manage resistance issues.

So what did we learn? In a nutshell, while the majority of superintendents (75 percent) indicated they haven't dealt with resistance issues in the last three years, more than half (68%) subscribe to regular product rotation to avoid resistance issues. From these data points, it could be surmised that product rotation is, in fact, working for superintendents.

In addition, dollar spot is, by far, the most troublesome pathogen when experiencing resistance issue, followed by anthracnose.

The following superintendents shared their experiences with fungicide resistance.

## TODD VOSS

### DOUBLE EAGLE CLUB



Todd Voss is in charge of the turf at the Double Eagle Club in Galena, Ohio. The Jay Morrish/Tom Weiskopf design opened for play in 1992, and Voss notes resistance issues appeared even before the course was finished.

"Back during construction it seemed like a lot of new golf courses developed resistance to the Class DMI fungicides," he says. "Whether it was use or varieties of disease blown in, I don't know, but by 1996 we were diagnosed with resistance to the DMI class [fungicides]."

So Voss stopped using DMI class fungicides and worked with plant pathology experts at Ohio State and supplier product specialists to develop an alternate approach.

Around 2006 Voss was advised he could go back to using Class DMI fungicides. By that point, however, he had found an alternate approach he was comfortable with. And while protocols are always subject to adjustment because of changes in regulations, Voss, who today is also Double Eagle's chief operating officer, has the tools he needs to combat his most pressing concern, dollar spot.

"Our backbone is chlorothalonil," he says, "And we have chosen to go with lighter rates (but) more frequent. Because of label restrictions we also will add one or two applications of an iprodione product, and we've also started using some other chemistries, some of them being more of a blend that does have some DMI classes in the mix. I'm working very closely with the plant pathology department at Ohio State to make sure we do not make the same mistakes again when it comes to fungicides."

By spraying weekly Voss actually uses less product over the course of a season. "Weekly, we use less than we would if we were doing bi-weekly or monthly applications," he says. "Even though we're spraying more, at the end of the day we're spraying a lot less (active ingredient)."

Voss concedes he and his team have an advantage that superintendents at most other clubs do not because Double Eagle is an exclusive private club with limited play, it's relatively simply for the crew to spray on a weekly basis without getting in the way.



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## ALAN FITZGERALD

### LEDGEROCK GOLF CLUB

Alan Fitzgerald has been the superintendent at LedgerRock Golf Club in Mohnton, Pa., since it opened for play in 2006. In fact, Fitzgerald supervised the grow in.

At first, Fitzgerald relied primarily on generic-brand fungicide to make his budget work; his chief nemesis was dollar spot. But there came a point where the generic brands began to lose their effectiveness.

To complicate matters, around 2013, the quality of the club's irrigation water declined dramatically and the water became too alkaline. This rendered the fungicides

Fitzgerald was using less effective. And as it turned out, those products weren't saving him any money either.

"I started doing the math on the cost of generic vs. the control we were getting out of them," Fitzgerald says. "And I started looking at the name-brand products and the cost of spraying them and I had noticed that the brand-name products during that period were providing way better control

"Basically how it worked out was the name-brand cost was about double the cost of the generic, but I was

getting over double the control period. It's not just spent money; you're not spraying (as often), there is less wear and tear on the machines, you're not paying your guys to go out and spray. It's not just the cost of the material, it's the cost of the other stuff too."

At present, Fitzgerald's fungicide toolkit contains an assortment of generics along with name-brand products such as Emerald, Curalan, Secure or Lexicon.

"With the new generics, we're getting much better control than we were with them," he

says. "But we're not using as much (product) as we used to. With some of the new chemistries from the big-name companies and the name-brand products, we're getting 21-28 days out of things as oppose to maybe 10 out of a generic."

Fitzgerald notes that the application rates on today's fungicides are lower than their predecessors. When it comes to preventative spraying, his philosophy might be described as minimalist, unless circumstances like the weather dictate otherwise. If hot summer weather dictates he spray

preventatively to prevent a pythium outbreak, he will. But that approach is the exception rather than the rule.

"We have a pretty good tolerance of disease," he says. "I will do a preventative application one or two times to knock down the populations before they appear, but generally once the season starts we wait. We're not on a tight schedule where we spray every two weeks or three weeks. We'll wait until we see something."

Fitzgerald doesn't have to deal with a lot of play; perhaps 10,000 rounds per season.

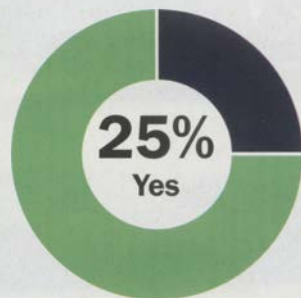
## OFFENSIVE STRATEGY

Sometimes the best defense against fungicide resistance issues is a good offense, i.e. an effective preventative program. Eric Johnson is the director of agronomy at Chambers Bay in University Place, Wash. He hosts about 35,000 rounds each year, but his disease concerns have been minimal.

"We really don't have any major disease issues," he says. "Our current programs are preventative for microdochium in the fall, winter and early spring and fairy ring. Our programs are monitored, reviewed and adjusted when necessary. We try to stay up to date with new chemistry and consider replacing fungicides (or other practices) if it benefits the health of the turfgrass."

Johnson believes promoting overall plant health is the most effective way to ward off fungicide issues. "We attempt to minimize inputs while doing all we can to optimize plant health," he says. "Gathering input from sales representatives, technical representatives, colleagues and online research is very helpful in setting up our program."

### Have you dealt with fungicide resistance issues within the last three years?



### Which pathogens have you been experiencing resistance issues?

74%	Dollar spot ( <i>Sclerotinia homoeocarpa</i> )
18%	Anthrachnose ( <i>Colletotrichum cereale</i> )
11%	Microdochium patch/Pink snow mold ( <i>Microdochium nivale</i> )
11%	Pythium blight ( <i>Pythium aphanidermatum</i> )
7%	Gray leaf spot ( <i>Pyricularia grisea</i> )
7%	Other
5%	Powdery mildew ( <i>Blumeria graminis</i> )

Editor's Note: "Other" responses included: take-all patch; fairy ring; and brown patch.



## GREGORY JACK

### TPC TREVISO BAY

Gregory Jack has been the superintendent at TPC Treviso Bay in Naples, Fla., since November of 2014. The club is a private facility and gets the bulk of its play from November through late April, but allows non-member play during the off-season.

Jack, who has been in the turf industry for 12 years, has dealt with dollar spot, pythium root rot and an assortment of other diseases. He says he hasn't had any significant resistance

issues, but says on some occasions his fungicide of choice hasn't worked as well as he would have preferred.

"We use the (approach) 'change the mode of action,'" he says. "Changing chemistries."

Keeping track of rotating fungicides can be a daunting task. So Jack has developed a system for doing just that. "I've actually broken down a spreadsheet with all my fungicides," he says. "When I'm doing early

ordering, it's based on which category and the cost per application. I break it down from that standpoint so I can rotate chemistries."

To further tilt the odds in his favor, Jack maintains what he calls his fungicide file, which contains a list of what fungicides fall into what particular category along with their individual characteristics. He also relies on the efforts of researchers at various academic institutions,

notably Ohio State University and also the University of Kentucky, which published a study last year on the chemical control of turfgrass diseases.

"It (lists) which fungicide works for which actual disease," Jack says, "the efficiency rating and then the base, how long it's good for.

"You can look at it and say 'Which disease am I wanting to go after, which products work well on it, and then, How can I rotate

them?'" he adds.

It can be argued that a superintendent can never have too much information at hand. When dealing with a problem, time is of the essence.

"I keep that file in a separate-colored folder," Jack says. "I know right where it is. Usually during our peak season it sits right on top of my desk."

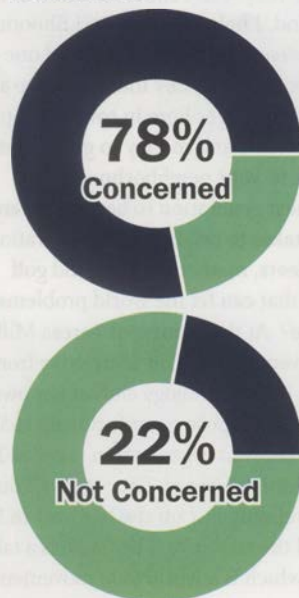
Rick Woelfel is a Philadelphia-based writer and frequent GCI contributor. GCI editors also contributed to this report.

## Describes your fungicide use philosophy?

<b>68%</b>	Rotate chemistry, do not use any one product or MOA exclusively
<b>10%</b>	Use integrated disease management
<b>6%</b>	Maintain manufacturer's recommended dose
<b>5%</b>	Restrict the number of applications applied per season
<b>4%</b>	Other
<b>3%</b>	Use the product until it is ineffective
<b>3%</b>	I do not have a set fungicide use philosophy
<b>1%</b>	Avoid curative rates

Editor's Note: "Other" responses included: all responses would apply; spot-treat areas; and maintain strict application schedule.

## When considering options for fungicide resistance management, are you concerned about product rotation?



## Have you stopped using any particular fungicide products or class of products because of resistance issues?



# WHAT I DID DURING WINTER VACATION



**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.

I spend my winters volunteering and working on how to fix the world, one problem at a time. One project I worked on is now saving one U.S. soldier's life a day and is well on its way to saving 166 civilian lives a day on U.S. roads and highways. I did not do this myself, but rather as part of a large team that everyone was invited to join. To describe my part in it think of me as an ant helping to move a potato chip.

Now I am on to the next thing. For kids to fix the world they are inheriting, they are going to need science, technology, engineering and math skills. Studies indicate our generation has not done enough to encourage the development of the necessary skills in the next generation to run the country after we are gone. Oops.

In reply to my suggestion that it can't be all that bad, I was told that we do not make the chips that go into our weapon systems and have not made them for years. They are made by foreign countries. As a military veteran and engineer, I know what she meant. I was being told that the first thing the next generation is going to have to do is replace all the weapons that my generation is leaving to them. This is a big job requiring beaucoup skills. Tick-tock.

Kids like guns and it is never too soon to learn about gun safety, so when they find one they won't shoot themselves or another kid. With that in mind, I helped start a 4-H Shooting Sports program here in Traverse City, Mich., and used one of my shop bays as a shooting range until they found a home at one of the commercial shooting ranges here in town. 4-H provided training for adult instructors and money to get it started. This is something you can do in your neighborhood too.

What will encourage the next generation to become interested in developing the skills it takes to become their generation's scientists, technicians, engineers, mathematicians and golf course equipment managers that can fix the world problems they will face in their lifetime? At the request of Teresa Mills in Fife Lake, the next town over, about a half-hour drive from here, I am helping her start a 4-H technology club of her own and helping her set up a general purpose manufacturing facility/community center. Her non-profit organization is called Fife Lake MakersPlace and Community Center. They are well on their way to building a new building just off the highway in Fife Lake and outfitting it with all the cool toys. The name is a take-off of the word MakerSpace which is a worldwide movement



to create workshop spaces outfitted with tools and materials where anyone can learn how to use the tools and build anything they can imagine. Who wouldn't want access to \$2.5 million worth of cool tools for a fee similar to a gym membership? What would you build if you had access to tools and a space to work? MakerSpaces typically have 3-D printers, laser cutters, welders, lathes ... well you get the idea.

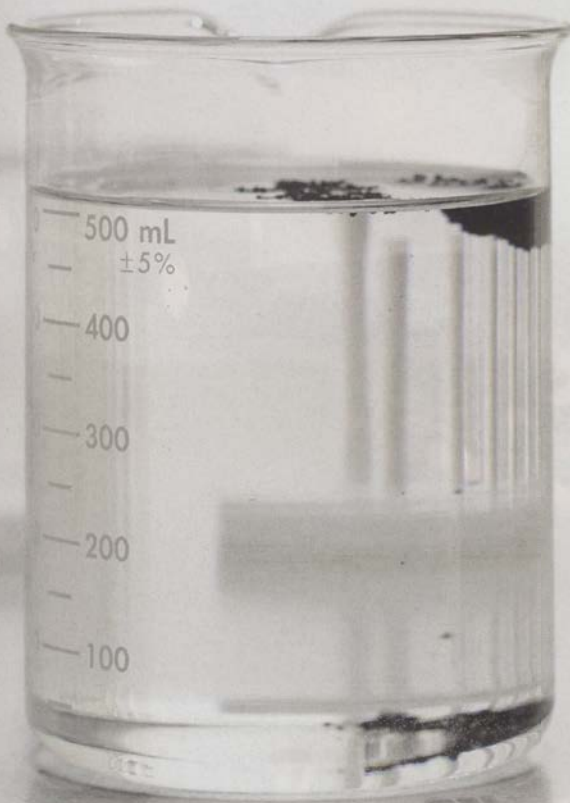
Why do I do all this? Why should you do this too? It is called pay it forward. The people before us got us

to where we are now and it is up to us to pass on what we know before we age out of the system.

Who are the customers of a golf course? The ones I have met were the key people of their generation and are retired now. They can be supporters, mentors, volunteers for FIRST robotics teams (firstinspires.org), 4-H technology clubs (4-h.org), or their local MakerSpace and pass some of what they know to the next generation. All it takes is for someone to ask them to help. GCI

## START A 4-H CLUB

To start a 4-H club, all you need are: five kids, ages 5 to 19, from two or more families; one adult volunteer; a theme the club will be organized around; meet at least six times a year; create learning experiences that utilize community resources; and recognize the growth and learning of those involved. You can learn on the job. 4-H has been around since 1902 so they have all the forms, procedures, and training materials, that you might want, and they have money.



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# B E Y O N D CULTIVATION

The evolution of grooming and brushing has had an ongoing impact on the highest quality turf.

**T**here are tools and techniques available to the golf course superintendent to improve overall turf quality and playing conditions. The most familiar of these are forms of cultivation.

Cultivation, as it applies to turf, is working the soil and/or thatch layer through various means without permanent damage to the turf. The result is an improvement in overall turf health. Cultivation includes core and solid tine aeration, slicing, spiking and

By **Anthony L. Williams, CGCS, CGM**

verticutting. These activities involve some disturbance to the soil/thatch layer.

Often the quest to provide the best putting surfaces possible carries the golf course superintendent into innovative processes that expand the limits of what can be achieved. This is where the evolution of grooming and brushing has had an ongoing impact on the highest quality turf. Grooming and brushing are both less

invasive than verticutting and share the goal to encourage vertical growth in the plant. Let's examine the concepts and potential benefits of grooming and brushing and see if they may be the perfect addition to your program.

Grooming reels are available from most of the primary equipment companies and while they may differ slightly all focus on the objective to mechanically remove excess

leaf tissue to encourage a more vertical growth habit. Grooming should focus on impacting the parts of the plant above the soil line in contrast to verticutting, which removes organic matter and tissues through the turf canopy and into the soil at a desired depth.

What actually occurs during the grooming process is that a series of light weight vertical blades (thin kerf) reaches down below the actual height of cut to remove horizontal runners/leaf blades and other organic matter. These vertical blades can be adjusted to various



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spacing usually ranging from .250 inches to .500 inches, depending on how aggressive you want the grooming action to be on the turf. Remember, when setting the depth for grooming a general rule of thumb is to be at or slightly below the height of cut and never exceed 10 percent below the height of cut.

The benefits of a regular grooming program include less graining, increased ball roll (green speed), improved water penetration, improved microbial activity, more efficient soil gas exchange, drier turf canopy, changes in the growth point of the new turf closer to the true crown and more vertical with time. These combined

benefits also allow the turf to be healthier and more resistant to diseases and other common cumulative stresses.

However, be cautious during times of heavy stress on the turf and be sure the physical stresses of grooming though less than verticutting have been well thought out. Try to plan a grooming schedule that considers turf type (cool or warm season), turf use (green, tee, etc) upcoming events, topdressing and spray schedule and of course ultimately the optimum health of the turf are being considered.

Brushing is another solid addition to your agronomic programs. Brushing and groom-

ing produce similar results through two physically diverse approaches.

Brushes were the original way to remove leaf blades, reduce grain and increase vertical growth habit. These early efforts were usually self-fabricated front-mounted brushes that stood up the leaf blade prior to the reel making the cut. The results were generally good and affordable. The brush bristles were either stiff or soft and both worked well in given conditions.

When making brush or bristle choices the stiff bristle brushes are perfect for periods of lush active growth while a soft bristle brush is better for

transitional periods prior to the arrival of summer or winter turf stresses. There has been a renewed interest in brushing as new turf grass cultivars have been introduced with mowing heights as low as a 1/16 inch mandating every technique be used to achieve the desired bench marks in turf quality and playability. Thus, innovation came to the process of brushing and highly effective rotating brushes were introduced.

The benefits of this type of brushing include prominent stripping of the surface, less bruising and physical damage than groomers, removal of Poa seed heads, reducing grain and increased ball roll.

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There is an art to adjusting the engagement depth of rotating brushes and it relates to a risk/reward aptitude from the superintendent. However, there are a few general guidelines that can help you dial in a brushing program to exceed players' expectations.

In brushing, like all procedures that impact turf, start with the lightest settings and work progressively forward until you find the desired result. It is a good idea to raise the mowing height at least 10,000th of an inch for the initial brushing and then drop 5,000th of an inch every other day until you reach the desired results.

There are a few guide lines

for setting the brush height depending on how dense the turf is, you should set the brush height at the height of cut if the turf is very dense adjusting lower as positive results are generated and adjusting higher if the results are negative. Always set your brush height at the high side on the brushes, not the short or low side.

The benefits of grooming and brushing are well documented, but there are some things to consider to ensure success within these programs. When scheduled properly, grooming/brushing can have a positive impact on top dressing, spraying and applying granular products by allowing better

canopy penetration and soil contact. But it can also have a negative impact if done too soon before/after these applications through increased plant stress or removal of material.

My long-time friend Jim Stuart, the award-winning lead equipment tech at the Stone Mountain Golf Club near Atlanta, says: "Groomers and rotating brushes are precision pieces of engineering and in order to perform up to the standard they must be properly set up and monitored so that all of the moving parts are functioning at peak performance. Nothing should be left to chance this includes the speed of the machine, RPM ratio (1.75:1

for example) and even operator training. It does not matter whether the grooming/brushing is being done with a walking mower, triplex or larger mower; factory specified or locally fabricated equipment, the attention to detail and awareness of plant responses are critical to success."

Grooming and brushing reward those who can customize these programs to complement their base agronomic goals, finding the combination of function, set up, execution and adjustment. **GCI**

*Anthony L. Williams, CGCS, CGM, is a retired Georgia superintendent and a frequent GCI contributor.*

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# NORTHERN NUISANCE

Warmer temperatures mean nematodes are causing problems in unlikely places as the industry still adjusts to the absence of Nemacur.

By Rick Woelfel

**A**t one time nematodes were considered a regional problem. They first became an issue in the Southeast where they thrived in the sandy soil prevalent in the region.

“Some of the more damaging nematodes are found in sandy soil,” says Dr. Billy Crow, a landscape nematologist at the University of Florida who has been researching nematode control options for 15 years. “Down here in Florida we have sand everywhere so nematodes are a problem on greens and tees, and fairways, and roughs, and athletic fields and lawns. Some of the more damaging nematodes, for example, sting nematodes, really have to have a lot of sand to survive. They aren’t going to be a problem in heavy soils but will be in sand-based greens.”

Dr. Nathaniel Mitkowski, who chairs the University of Rhode Island’s Department of Plant Science and Entomology, is seeing increased nematode populations in his section of the country along with attendant turf damage. Changes in weather patterns are one reason why.

“Climate change and increased temperatures are going to have an effect on nematode biology,” Mitkowski says. “Nematodes are going to reproduce more quickly when the temperatures are warmer. With longer seasons they’re going to have more opportunity to attack roots and potentially have more generations.”

And while human activity – such as contaminated sod or main-

tenance equipment – is responsible for some of the spread of nematodes, he says at the heart of the issue is the prohibition on Nemacur. “People that may have had a (nematode) issue and just dealt with it don’t have the tool to deal with it the way they did,” he says.

Alternatives to Nemacur are coming on line, but none of them are as versatile as Nemacur was, Mitkowski says. “Some are better on some nematodes than others and (more effective) under some conditions than others,” he says.

Turf management practices also contribute to the nematode problem. “We’re constantly lowering mowing heights, which makes nematode problems more severe because the grass is under more stress,” Crow says. “[In Florida]

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## ALUMNI UPDATE

In early December of 2015 all the ingredients for a great experience came together at the Syngenta Business Institute. The people, including superintendent attendees, Syngenta's staff, Wake Forest's academic talent and the facility staff were all outstanding. I found the subject matter relevant and expertly presented. Further, the warm hospitality and comfort of the facility made an incredible atmosphere. The comradery and exchange of information and experiences among attendees and presenters made the experience memorable. This is a success-laden program that is a benefit to our industry in many ways.



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## PESTS



Below-ground effects of sting nematodes – the roots are shallow and are necrotic brown in color (dysfunctional and/or dead).

we're using the ultradwarf Bermudagrasses which tend to be more susceptible (than older strains of Bermuda)."

Modern green complexes, built to USGA specifications have been shown to be more susceptible to nematodes than old-style pushup greens. "USGA-spec greens are an ideal habitat for nematodes," Crow says. "The move to sand-based greens makes nematodes more of an issue."

In his part of the country – lower New England and upper Mid-Atlantic – the microscopic, non-segmented round worms are especially problematic on putting greens, Mitkowski says. They feed on root systems any time the ground is not frozen. To compound the matter, nematodes, at least in New England and the Northeast, are most active during the summer when the turf is most stressed. Their presence leads to additional stress, decreased disease resistance, and decreased response to water and fertilizer. In ex-

treme cases, nematodes will kill plants.

"All golf course putting greens have populations of plant-parasitic nematodes," he says. "But for reasons that are still not well understood, these nematodes do not always reach problematic levels on every course."

There are several options for dealing with nematodes. If a club has limited resources, then it may deal with the issue the way it would with something like heat stress. The turf will feel the effects during the summer months and recover in the fall, Mitkowski says. Heavy overseeding, beginning in late August, will be required to replace lost turf.

Raising cutting heights on the greens (to 0.135 inch or higher) and reducing the number of mowings or reducing the number of rounds to reduce foot traffic is another option. The downside is golfers may become frustrated with slower green speeds but the turf will be healthier.

A story on finding “the right balance” in situations of this sort would likely fill this entire magazine.

As far as chemical controls are concerned, Mitkowski says there aren’t as many proven options available for nematodes as there are for other turf issues. “There isn’t a lot out there that’s effective,” he says, “and for the most part what we’ve seen is that superintendents who use other organophosphates for insects will get some pretty good nematode control out of that. If the superintendent makes a Dylox (trichlorfon) application for white grubs or a Dursban (chlorpyrifos) they will likely have success with nematodes because they all affect the same systems.

“Unfortunately, Dursban is currently in registration review. There was supposed to be an announcement in December, and I think they’ve pushed it off so we don’t know what the fate of chlorpyrifos is going to be. Dylox I don’t believe is facing a re-registration concern.”

But Mitkowski is quick to point out that Dursban and Dylox aren’t labeled for nematodes, although there is usually a drop in the nematode population when those chemicals are used to combat other pests. “You can’t really go in and say, ‘I’ve got a nematode problem. I’ve got to drop seven ounces of Dylox on it,’” he says. “That’s an illegal approach. Experimentally yes, we’ve seen it work.”

Crow has seen other products have a positive impact further South. “In costal and southern states we have Curfew, a soil fumigant,” he says, “which works very, very

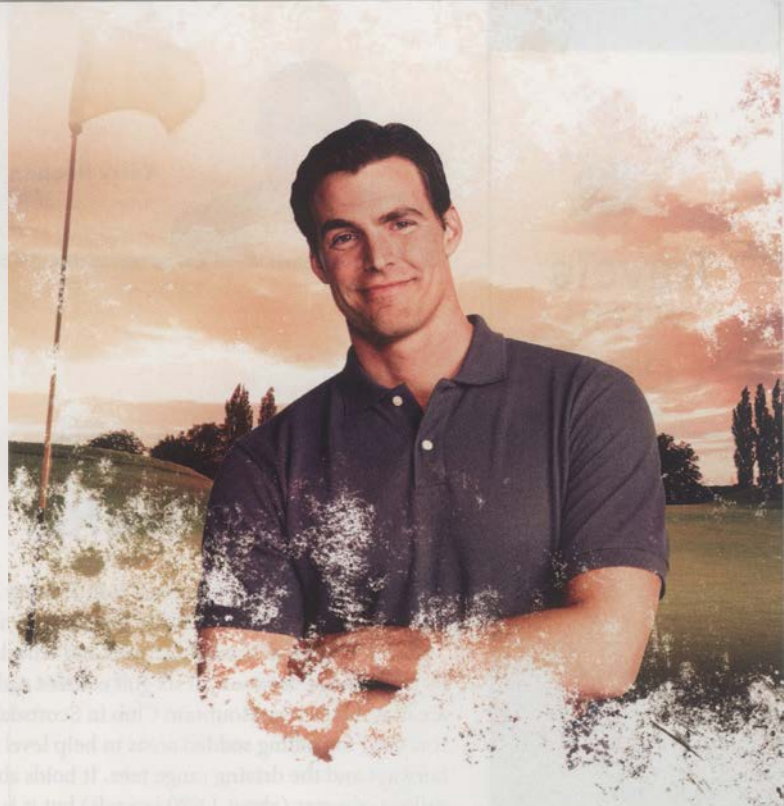
well on sting nematodes. Less so against some of the other ones but it’s like magic on sting nematodes, which is the most damaging one.”

“We have abamectin which is an insecticide that also controls nematodes. There’s a formulation of abamectin called Avid, which is currently labeled in a number of states for nematodes, but just on greens. It doesn’t move in soil very well, but it’s effective against root-knot nematodes because they stay up in the thatch. It’s not as effective against some of the other ones but it works really, really well on root-knot nematodes.

“There should be a new formulation of abamectin coming out this year that we’ve work with. It has a little bit better soil movement than Avid does. So there will be a new abamectin formulation that will have a national label as opposed to the current 24(c) special-local-needs labels, which are state by state.”

Some wonder why no broad-spectrum replacement for Nema-cur was in the pipeline. Mitkowski says it’s a matter of cost and return. “The cost of developing any of these materials is incredibly high and the return from golf courses is very low,” he says. “Almost all the products we have in golf turf were originally developed for agricultural purposes because that’s where all the acreage is. Then, after they’ve been successful in that arena, they (make them available) to the turf world.” **GCI**

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



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## Travels with Terry

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



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

## FAIRWAY ROLLER EXTRAORDINAIRE

The Schmeiser Smooth an' Roll Fairway Roller (approximately 8 foot by 10 foot) was modified by adding a lift frame, turf tires and wheels so it could be transported between all six golf courses and practice areas at the Desert Mountain Club in Scottsdale, Ariz. It is used for rolling sodded areas to help level them on fairways and the driving range tees. It holds about 200 gallons of water (about 1,670 pounds) but it is used empty by using the hydraulics as down pressure and because of the unit's weight. The three-point hitch drawbar is simply lifted to raise the roller for transport. The parts cost about \$300, some parts were recycled and it took about four hours to modify. Bob Voita, lead fleet mechanic, Rodney Sparks, equipment manager, Alex Ward, superintendent at the Apache Course, and Shawn Emerson, director of agronomy, make up this great team.



## TRAILER DYNAMIC DUO

The 2012 Toro Workman MDE bed corner was damaged by a garbage truck so the bed was replaced. The damaged bed was recycled by placing it on top of a 2001 Broyhill Metal Greens Mower Trailer, using scrap lumber and paint that was in inventory by the creative minds of Jerry Squires, horticulturist, and Heath Raverty, irrigation technician. They built a frame to lift the bed off the metal trailer and raise it up for use primarily as a fairway divot mix trailer. The Broyhill metal tailgate drops down for convenient underneath storage for buckets, tools, etc. It took about two to three hours during the wintertime and all of the materials and parts were in inventory to complete the project. Brandon Schindele is the superintendent at the Edina (Minn.) Country Club.





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# TARTANS OF A NEW ERA



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

**T**he grainy black-and-white photo of 10 men standing behind the famed Pinehurst Putter Boy statue in 1947 is one of the most compelling images in the history of golf course architecture. It was the first meeting of the American Society of Golf Course Architects, hosted by Donald Ross, and attendees pictured included the likes of Stanley Thompson, W.B. Langford, William Bell, a young Trent Jones and, of course, Mr. Ross himself.

It was a very exclusive club in those days. Architects were more master craftsmen and artisans, and the group felt more like an old-school guild than a modern association. They were a band of competitors who came together because of a common interest ... advancing the art, the science and, above all, the business of golf course design.

The society grew over the decades but the close-knit sense of guild remained. They even adopted the eye-popping red Ross clan tartan jackets that have become a familiar sight at GIS and other golf meetings. Golf went through big growth spurts along the way, notably the crazy go-go '80s and '90s when we built a zillion real estate anchor courses. Yet the membership of ASGCA remained elite and a growing number of designers, including many Tour pros who were lending their famous names to courses, were not part of the group.

The golf design business reached its apex in 2000 when 400 new courses opened in the U.S. Ironically, the last ASGCA annual meeting I had attended was in Columbus in 2001 ... the year that alarm bells were starting to sound about the market being overbuilt. Banks got nervous about funding construction in a crowded market and the design business slowed before coming to full stop in 2008. Since then we have closed five times more courses than we've opened.

But the past few years, things have been changing. We're still only building a handful of new facilities (mostly spectacular destination courses) but clubs are getting smart and investing in renovation, remodeling and refreshing to be more competitive in the smaller golf market of the future. So, as I was honored to attend my first ASGCA meeting in 15 years last month in Washington, D.C., I found some startling and very promising changes in the organization:

The old guard was still well represented with Rees and Bob Jones, Roger Rulewich, John LaFoy, Bill Amick, Bill Coore and other legends attending, but young faces were everywhere. (Well, they looked young to me at least!) Many of the leadership positions are now held by energetic folks like Jason Straka, Mike Benkusky and even the newly installed president, Greg Martin. These people understand the modern golf business and are well-positioned to help the society grow and change. Not that old guys are bad (I'm proud to be one of them) but it's always healthy to have new ideas and perspectives among your leadership.

There's a sense of openness and optimism about the future. The pipeline for redesign work looks like it will be flowing for a decade. Yet every conversation I had confirmed ASGCA members work extremely hard to secure these projects and they take them very seriously. The quality of the work being done today and the demands from owners/clubs are both sky high. They treasure every project and take amazing pride in the outcomes.

The society is more integrated and connected to the golf community than ever before ... a fact emphasized by both executive director Chad Ritterbusch and guest speaker Rand Jerris, the USGA exec who oversees facilities programs and the Green Section.

The program was inclusive of industry suppliers, including partners like Toro, Rain Bird, Troon, Landscapes Unlimited, Profile Products, Atlas Turf, Better Billy Bunker, Turf Drainage Co and Brookside Labs. There was a terrific panel discussion featuring Chris Hill of Course Crafters and supers Matt Shaffer (Merion), Scott Furlong (RTJ Club), Dave Swartzel (Bedford Springs) and Rocco Greco (Binghamton CC) where each talked about why they chose one of the newer bunker technologies.

Finally, there was remarkable camaraderie. Perhaps that's one thing that's changed the least over the years. It mirrored my thought about the modern-day Golf Course Builders Association of America and how the recession and the crisis in the construction market tended to weed out the part-timers and those who weren't truly passionate about the business and left the true believers behind.

Nearly 70 years after that first small group of pioneers gathered at Pinehurst the ASGCA seems as dynamic and engaged in the market than ever before. I was grateful for the chance to see so many old friends again but, more importantly, I'm heartened about the future being shaped by many younger ones. **GCI**



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