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A golf course waiting to happen

Although Stoatin Brae Golf Club opened just this year, its natural characteristics are reminiscent of an old Scottish links course, and its superintendent plans to keep it that way.

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Building a strong core

As the author has learned, a 'next man up' mentality in the maintenance building is an insurance policy in which courses should invest.

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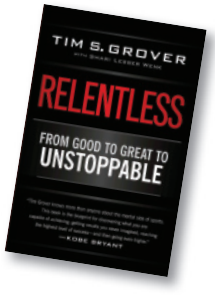
COLUMNS

DEPARTMENTS



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Golfdom

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*The grounds staff of Liberty National Golf Club, led by Superintendent **Greg James** (center)*

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"As a thank you… to the GCSAA chapter that responds with the most surveys, I will road trip to one of your chapter meetings next year and personally deliver a keg of your finest local beer."

SETH JONES, *Editor-in-Chief*

In the garage, where I belong

Greetings from northeast Kansas, where we're happy to talk about Kansas City Chiefs football so we can pretend that Kansas University football isn't a real thing. Youth soccer season finally has ended, and now my 6-year-old boy wants me to take him to the local par-3 course on Saturdays. I'm happy to oblige. That's so much better than barking orders at his kindergarten soccer team, begging them to spread out and not play bunch-ball. Although, I have about as much control over my own golf ball as I did that soccer team…

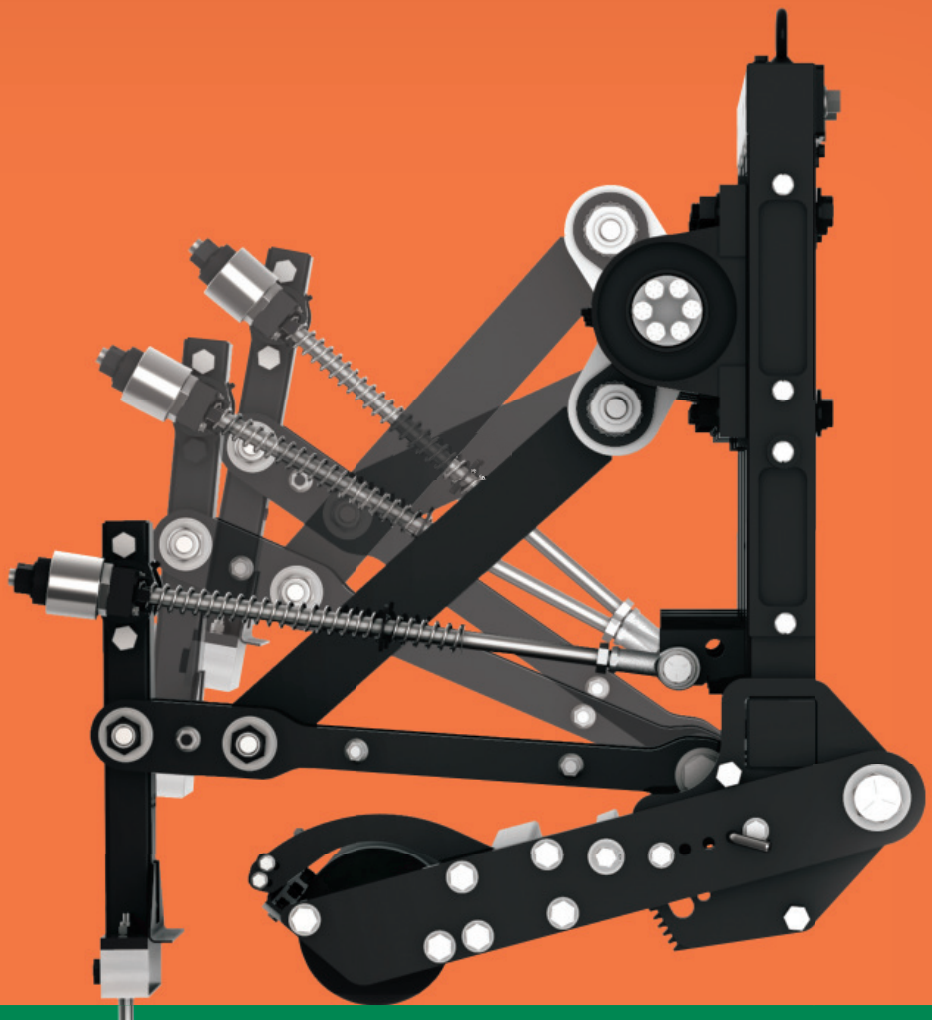
The weather has been so nice here this fall that a few weeks ago I moved my home office to the two-car garage. I realize now that I may have gotten carried away. It started out as a lawn chair and my laptop on top of a cooler, a humble setup. Now I've got a desk, dual computer screens, a couch, the 100-disc jukebox, my kegerator, and last week I mounted a 55-inch flatscreen on the far wall. Meanwhile, my '64 Impala is parked in the driveway staring back at me, wondering if there's an outdoor winter in its future.

I don't know what I'm going to do when the cold weather comes, but for now, I'm living the dream. I just hope my wife doesn't suggest I make the garage not only my office but also my permanent residence… but if she did, I would at least be comfortable.

There's clearly no one point I want to make this month, so let's get to the bullets:

- Thank you to our many readers who completed our chemical-use survey this summer. One of the things you told us is that your preferred method of learning about new trends and products are print magazines like *Golfdom,* which is reassuring, to say the least. There were some other interesting takes, but I'm saving those details for next month's issue, where we will be unveiling our State of the Industry Report.
- Along those same lines, I recently emailed everyone with another survey to bolster the summer chemical survey, and to get readers' takes on a wider variety of topics. This survey will be used to help us with our State of the Industry Report. As a thank you to those who take the survey, I will be giving away one Yeti cooler to a randomly selected participant, and to the GCSAA chapter that responds with the most surveys, I will road trip to one of your chapter meetings next year and personally deliver a keg of your finest local beer. (And of course, I will enjoy a few with you.) The survey should be in your inbox right now, or you can review it by visiting **Golfdom.com**. We'll also post it to social media (Facebook and Twitter) so you can see it there. Just look for the photo of me with the aforementioned Impala, in what Associate Editor Grant B. Gannon told me looks like a high school senior photo taken 20 years too late…
- Coming in the January issue, we will be celebrating the 90th anniversary of the launch of *Golfdom* by Herb and Joe Graffis. We have a lot planned, including a timeline of the magazine, vintage advertising and new tales of Herb Graffis from those who knew him well (Mr. Graffis died in 1989 at age 95.) If you have any personal stories or memories of Mr. Graffis or any fun old *Golfdom*-related stories in general, I'd love to hear from you… please feel free to reach out. My garage doors are always open.

Email Jones at: sjones@northcoastmedia.net.



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NEWS, NOTES AND QUOTES

//DID YOU BRING COOKIES?

Members of local Girl Scout Troop 3410 traveled to Bethpage State Park for a day of planting and pollinator education.

BETHPAGE INVITES BEES AND GIRL SCOUTS

By Andrew Wilson // *Director of Agronomy, Bethpage State Park, Long Island, N.Y.*

We have maintained honey bee hives on Bethpage's Black Course — the site of the 2019 PGA Championship — for a few years, but it wasn't until I read an October 2016 **Golfdom.com** article about Cantigny GC's bee hives that I learned about Bayer Crop Science's Bee Care program.

Initiated in 2012, Bayer Crop Science's Bee Care program includes the "Feed a Bee" initiative. Bethpage State Park Horticulturalist Victor Azzaretto and Park Ecologist Yael Weiss submitted a proposal to Bayer in the spring, and Bayer awarded Bethpage $5,000 to expand pollinator gardens in the park.

On Aug. 19, National Honey Bee Day, local Girl Scout Troop 3410 joined the crew at Bethpage for a day of planting and education. Azzaretto selected 40 different types of plants for the garden — based on factors including bloom time — to provide food for pollinators over the course of the year.

Weiss engaged the scouts in activities that emphasized the importance pollinators play in our ecosystem and explained how golf courses can provide green space for these pollinators to thrive. Bayer representatives, along with Kevin Doyle from GCSAA, a few local supers in the Long Island GCSA, and the Girl Scouts, helped the crew fill in the garden.

To help promote education beyond the event, Weiss created park signs with QR scan codes that link to Bethpage's ecology blog, which provides more information on the park's plant life. The spring planting event was a big success, and I'm happy to report that Bayer proposed another event for next year.

//PENNINGTON POWER

BASF'S PENNINGTON INDUCTED INTO TUSKEGEE ATHLETIC HALL OF FAME

Willie Pennington, BASF turf and ornamental sales representative for North Carolina/South Carolina, was inducted into the Tuskegee University Athletic Hall of Fame as one of their athletic legends. The ceremony, which was held Sept. 15, recognizes Pennington's achievements as an offensive guard on the gridiron. Pennington was a vital team member whose abilities helped lead the Golden Tigers to back-to-back-to-back SAIC Championships in 1967, 1968 and 1969.

Willie Pennington

He earned his degree in chemistry education in 1970, and in 2017 celebrated 45 years with BASF. He received an extended standing ovation at the BASF National Business Conference in August, where, according to a press release, his contributions to the company were recognized.

BASF calls Pennington a "well-known and highly regarded professional who values friendship and respect, and brings warmth and trust to every relationship on the field, in the office, on the road and at home."

He lives in Raleigh, N.C., with his wife, Aris.

Willie Pennington (front row, second from the right) was one of 10 individuals inducted into Tuskegee University's Athletic Hall of Fame in 2017.

PHOTOS COURTESY: ANDY WILSON / TUSKEGEE UNIVERSITY ATHLETIC HALL OF FAME / ISTOCK.COM (WELLGLAD)

//TWO IS MORE THAN ONE

The Duke of the IGCSA annual meeting

After more than 40 years as a superintendent in Nevada and Utah, Melvin "Mel" Duke, superintendent at Toana Vista Golf Club, West Wendover, Nev., recently was named Superintendent of the Year and the Distinguished Service Award recipient at the Intermountain Golf Course Superintendent Association's (IGCSA) Annual Education Conference & Trade Show.

Melvin "Mel" Duke

"Being selected as the Intermountain's Superintendent of the Year by my peers was probably one of the best honors I've ever had in my life," says Duke. "I often think of how hard this is to do and all the criticism that you get, and to have this happen, it really shows you that all the hard work pays off."

According to the IGCSA website, the association's Distinguished Service Award has been given since 1995, and Duke says that the award "tells me that I'm passing on what knowledge I have and the abilities I have tried to portray all my life."

The 72 year old adds that he still looks forward to work every day.

"How can you beat being out in nature, being paid to do something that you love to do and you can play at your job?" says Duke. "That is just the ultimate, best thing that could happen to any one person in life."

Michael Maravich, SipcamRotam's vice president of specialty business, made the 22-mile, 19-hour round-trip hike to the peak of Mt. Whitney, Sierra Nevada, Calif. At 14,505 feet, this photo was taken at the highest point in the continental U.S. Maravich was one of 100 day hikers and 60 overnight backpackers to receive a permit that day, but he definitely was the only one to pack a *Golfdom* Summit flag. Congrats Michael, and thank you for representing *Golfdom*!

PHOTO COURTESY MICHAEL MARAVICH

//AUTONOMOUS FUNK

TORO'S FUNK-Y NEW CATT DIRECTOR

The Toro Co. has named Edric Funk as the new director of its Center for Advanced Turf Technology (CATT). He succeeds Dana Lonn, who retired in June 2017 after 48 years with Toro, according to the company.

In his new role, Funk's responsibilities will include leading a team of engineers, agronomists and product development professionals in identifying emerging industry trends and developing the next generation of solutions that address the needs of customers, while bridging future technologies that drive sustainability, productivity and efficiency, according to Toro.

The CATT team works alongside customers, academic institutions and researchers to make progress in several areas, including autonomous operations, labor productivity, environmental concerns (such as emissions and alternative fuels) and precision turf management, including irrigation efficiency and soil moisture sensing.

Since joining Toro, Funk has held several positions, beginning as a design engineer. Most recently, Funk served as director of worldwide product marketing in Toro's commercial business.

//GOLFDOM WISDOM

In a country where there is a divorce every 36 seconds, it's never a bad idea to stop by the course nursery and grab an ornamental to take home to the wife. #GolfdomWisdom

ABOUT THE COVER

This month's cover shot of No. 10 at Stoatin Brae Golf Club was photographed by Nile Young. Young has photographed over 300 courses in the U.S., Europe, Mexico and the Caribbean, and his work has appeared in many magazines, including *Golf Magazine* and *Links Magazine*.

Continued on page 12

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Continued from page 9

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Seth,

I finally was able to sit down and read your latest column in the September issue of *Golfdom,* "Disparate Golf Destinations." Being from rural Nebraska, I've had similar weekends, from playing on exclusive courses to low-budget and sand-green facilities. But my real take from your story is the illustration of what and where golf is today in America.

Everybody, whether they play golf or not, can relate to the "picture-perfect" Tour courses they see on TV every week. They are in perfect condition and they have unlimited budgets to achieve that perfection. These superintendents are under an enormous amount of pressure to deliver an unflawed product! Unfortunately, many of the masses who watch TV and do not play golf assume these courses are the "norm" of the industry and are the playgrounds for the wealthy.

Your example of the other extreme is a 9-hole sand-greens course.... low budget, low maintenance and maybe a staff made up of one part-timer who might even donate his time. When I moved to McCook, Neb., 37 years ago to build and manage our 18-hole facility, there were five sand green courses in the smaller communities surrounding McCook. Now there are one-and-a-half sand courses. The others have converted to grass greens. You might be wondering about the "half" course? It is a community that is converting to grass greens at a rate of two per year... they currently have four grass and five sand. This too, is also representative of golf in America!

Your third example (Topgolf) can be representative of golf's future and our ability to evolve and be innovative in today's changing business environment.

To me, the real message of your column is the importance of those courses in the middle. These courses are operating as a small business model (and) are striving to produce the best quality product possible with the resources they have. Your examples illustrate the diversity of golf... and they all play a pivotal role in our industry!

Bill Bieck, CGCS
Course Operations Manager
Heritage Hills GC
McCook, Neb.

"Being an assistant... always seemed like I was the most underrated and least appreciated person on the crew, with arguably the lousiest title ever."

JOE GULOTTI, *superintendent, Newark (Del.) CC*

A column with about a lousy title

A little over a decade ago, I was out with friends on a Friday evening unwinding from a hell week of keeping greens. It began innocently enough with just a few beers, then rapidly morphed into full-on rage mode as empty shot glasses began to accumulate around us at an alarming clip.

After about the fourth or fifth round of shots, I noticed a young lady checking me out. Surprised by being scoped (because in all honesty, I'm barely a notch above Brandel Chamblee on the scale of handsome), I sauntered over to the bar — fueled with liquid confidence — and began chatting her up.

Things started off well enough, despite my inebriation. All signs were pointing to, at the very least, digits being exchanged. Then she asked the inevitable question about what I did for a living. I slurred that I was an "assistant superintendent." That's when things went askew. She politely excused herself, and I never saw her again.

Perhaps she caught a whiff of my whisky breath or noticed the blue tracker stains on my Dickies, but I think she blew me off the moment I uttered the word "assistant." And who could blame her, because even before she totally dissed me, I was forming my own personal opinions concerning the title of this thankless position.

When I think of an assistant, I picture some feeble jerk kissing rears, fetching refreshments or running errands. Back when I was "assisting," my skills consisted of course set-up, applying pesticides, dropping urea bombs, felling trees, hand watering dry spots, learning to speak a somewhat respectable form of Spanglish, all while accomplishing a slew of other craptacular jobs that rarely get recognized or appreciated.

I wasn't fetching our superintendent his coffee or inflating his ego with false complimentary banter. I was an integral part of the squad, who was neither feeble nor a jerk (jerk is debatable).

This title "assistant" doesn't exemplify the duties of the position, and I'm sure most of us would agree that an assistant superintendent's role in the art of greenkeeping is extremely challenging and difficult. It's long hours, beat wages, a ton of responsibility and nary a hint of recognition. So, isn't it about time we abolish this antiquated title and rebrand it with something much cooler and magisterial?

How about for fun we go back in time and revisit the devastation I experienced and see what happens if my title is something a bit more dignified.

Attractive Female: So, what do you do for a living?

Me: I'm the vice executive of agronomy at the Poa Club.

Attractive Female: Oh Really!!! That's awesome!!! What do you do in the winter?

Me: Well, why don't you come back to my place, and I can tell you all about it on my sweet futon?

Attractive Female: You have a futon?

Me: Yes.

Attractive Female: I love futons! And Poa! And vice executives! Let's go!

See? Isn't it amazing what a cool-sounding title can do?

It's about time the industry makes this title change, and not for the shallow reasons of scoring with the opposite sex. An assistant, at least for me, always seemed like the most underrated and least appreciated person on the crew, with arguably the lousiest title ever. If the pay were equal and opportunities for advancement were similar, I might have entertained the idea of being a crew foreman. At least that title has some toughness. In any case, I believe this change should happen soon, because it's deserved and long overdue. I prefer "vice executive of agronomy," but if anyone else has a better idea, I'm all ears.

Joe Gulotti, superintendent at Newark (Del.) CC, is happy there is no longer a need for those awkward bar moments, as there is now a Mrs. Walking Greenkeeper. Contact him at hardg43@gmail.com.

Golfdom Gallery

Presidents Cup EDITION

1 Cruisin' Liberty National Former Liberty National Golf Club interns Ryan Martin (left) of Indian Valley CC, Telford, Pa., and Blaine Knox, Palm Meadows GC, Carrara, Australia, were two of the dozens of former LNGC employees to come back to help maintain the course for the 2017 Presidents Cup.

2 Vegas hits Manhattan International team golfer Jhonattan Vegas of Venezuela hits irons from Jersey City, N.J., toward the New York City skyline.

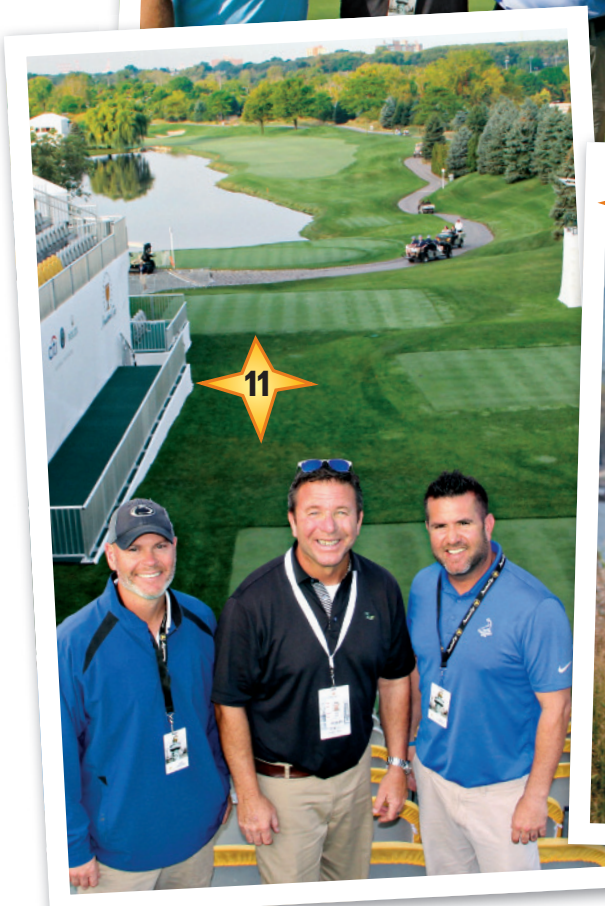
3 Time for a quick photo Jesse Dowdy, assistant superintendent at Liberty National GC (left), and Paul Vermeulen, director of competitions agronomy for the PGA Tour, in a rare moment when neither was directing traffic.

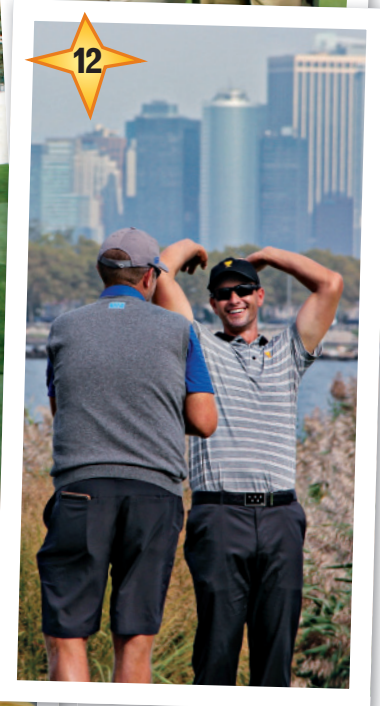
4 Family man What to do when you work so much you can't go home to see the family? Bring the family to work. Here Jesse Dowdy welcomes his wife, Ashley, and daughters Aubrey (1) and Mackenzie (4) to the Presidents Cup.

5 Reuniting with 2011 Old Tom Morris Award winner *Golfdom* Editor-in-Chief Seth Jones (left) got a selfie with International team captain Nick Price. Humble brag: The last time Jones saw Price was when he got dropped off by Price in Florida after a trek in Price's Cessna to Mexico.

6 Divots defeated The only victory more lopsided than the U.S. team defeating the International team was the win the divot crew had over divots: 8,232-0-0. (Left to right) Stephen Logan, Lochinvar GC, Houston; Eric Junkins, Overbrook GC, Villanova, Pa.; Shaun Marcellus, the Old Course at Saucon Valley CC, Bethlehem, Pa.; Justin Eckert, The Olympic Club, San Francisco; Shaun Weyer, Pikewood National GC, Morgantown, W.Va.

PHOTOS BY: SETH JONES





7 **Whip it good!** Our old friends Alan Easter, Southpointe GC, Canonsburg, Pa., and Brian Thompson, BASF, demonstrate proper clipping whipping form.

8 **Game recognizes game** When LNGC Superintendent Greg James (right) was introduced to Quail Hollow Club (Charlotte, N.C.) Superintendent Keith Wood, he called Wood "famous." Wood, who will host the 2021 Presidents Cup, argued that James was the famous grass grower of the two.

9 **Tom Kite visit** Before the Presidents Cup officially teed off, LNGC co-architect Tom Kite (second from left) stopped by the maintenance building to congratulate James, Dowdy, Heritage Links President Jon O'Donnell and the crew on a job well done.

10 **Floratine family** The Floratine family was out in force to support the LNGC team. From left to right, President and CEO Kevin Cavanaugh; Corporate Agronomist Paul Ramina; Executive Vice President Mike Cavanaugh; Executive Assistant and Director of Customer Service Kimberly Bookout; and Corporate Agronomist Pat McHugh.

11 **Now on the first tee...** Posing for a photo in the amphitheater built on the first tee are (from left) Macro-Sorb's National Sales Director Eric Greytok; Greg James; and Seeton Turf Warehouse owner/Sales Manager Brian H. Gjelsvik.

12 **Wave goodbye** International team player Adam Scott enjoyed himself during practice rounds. The tournament probably wasn't as much fun, as he went 1-3-0 on the week.

"The yardage announced for Shinnecock... is 7,439 yards, a 443-yard increase since the last Open. That is 440 yards longer than would be needed."

SEAN TULLY, *superintendent, Meadow Club, Fairfax, Calif.*

Too far in protecting par?

With the recent news that Shinnecock Hills Golf Club, Southampton, N.Y., will see its fairways narrowed for the 2018 U.S. Open, we again encounter the effort to protect par by narrowing the golf course.

After recent work by Bill Coore and Ben Crenshaw that saw some Shinnecock fairway widths restored to 60 yards, this is sad news, as we see a great course defending par instead of offering a varied test of golf. Hosting a major event historically has meant changes to courses, but for the most part they were improvements to the course, not an effort to make the course play harder. In recent years, there has been a noticeable change in course presentation regarding fairway width, rough, and most notably, course length.

But this apparently is not enough, as we see courses adding yardage as they prepare to host an Open. Shinnecock hosted the Open in 2004, and the course played to 6,996 yards. What will yardage be for the 2018 Open? Before I get to that, let's look at how the USGA and the R&A define how much farther the ball is going.

The USGA in 2016 released a distance report that detailed 2003-2015 driving distance information from the seven professional tours around the world. That data demonstrated increases of roughly .2 yard per year for four of the tours, while the other three tours decreased by the same distance. So, by USGA standards, Shinnecock would need to add roughly 2.8 yards to account for the increased distance golfers have been hitting the ball in the 14 years since the last time the venue hosted the Open.

However, the yardage announced for Shinnecock and next year's Open is 7,439 yards, a 443-yard increase since the last Open. That is 440 yards longer than would be needed, using the USGA numbers of a .2 yard-per-year increase in driving distance. Something just is not making sense here. They've basically added another par 4 to the course to address the latest driving-distance figures.

This is nothing new. We saw an increase of more than 450 yards for Merion Golf Club from the time that venue hosted its previous Open in 1981. A more recent example is Pinehurst No. 2, which hosted its first Open in 1999, has hosted it twice since then, and has seen a 390-yard increase to 7,565 yards.

Looking at yardage from a historical perspective paints a picture that shows the ball going farther and courses being lengthened to address it. The first U.S. Open to be more than 7,000 yards was Oakland Hills in 1937, at 7,037 yards. It would take 60 years to break the 7,200-yard barrier at Congressional in 1997 at 7,213 yards. Ten years later, the Open at Oakmont saw the first course at more than 7,300 yards, playing then at 7,355 yards. One year later, Torrey Pines played to 7,643 yards! Then there's this year at Erin Hills, where the course played to 7,741 yards.

Just looking at these yardages shows that since 2007, the USGA has added 400 yards to the courses that it identifies as U.S. Open courses.

Yes, it's true that competitors don't play to the full yardage listed on the scorecard, but the addition of this yardage is a response to how far the professional golfer is hitting the ball today, which allows the holes to be played at an increased distance.

Then you throw into the setup narrowed fairways, like what they did at Merion and Olympic, long rough with multiple heights of cut, and greens that play firm and fast, and you have a stiff test of golf! But is it setting the right precedent for the good of the game?

Sean Tully is superintendent at the Meadow Club in Fairfax, Calif. He can be reached at stully@meadowclub.com or followed at @tullfescue.

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US Patent No. 8,389,624 B2 Issued March 5, 2013, Additional Patents Pending

MADE IN USA

A golf course

BY CHRIS LEWIS

Although Stoatin Brae Golf Club opened just this year, its natural characteristics are reminiscent of an old Scottish links course, and its superintendent plans to keep it that way.

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waiting to happen

Stoatin Brae Golf Club's (Augusta, Mich.) Hole No. 2, a 225-yard par 3.

Course Owner and President Jon Scott says that Stoatin Brae is fast and firm when the facility is dry. He credits this to the combination of low-mow KBG fairways they seeded and the clayey soils on the property.

As Jon Scott, owner and president of Augusta, Mich.'s Gull Lake View Golf Club and Resort surveyed a 200-acre property on top of a 200-foot ridge (one of the highest points in Kalamazoo County), he was struck by one key characteristic: This former apple orchard only had five trees.

After all, Gull Lake View's other five championship courses are known for their tree-lined fairways and scenic forests. But the orchard's previous owner decided to clear out nearly all of the trees. Nevertheless, Scott believed the property, which is adjacent to Gull Lake View's Stonehedge Golf Club, was a golf course waiting to happen, as its topography is not only astonishing, but also has a Scottish feel to it.

So, Scott contacted renowned architect Tom Doak and his team at Renaissance Golf Design — Eric Iverson, Brian Schneider, Brian Slawnik and Don Placek — to design the course's holes and build its bunkers, greens and tees, while the Gull Lake View staff would finish the course's shaping, including the pea stone and greens mix layers on greens as well as the interior drainage in greens and bunkers.

Stoatin Brae Golf Club, the sixth championship course to be built at Gull Lake View Resort, was born.

Water for health, not color

Paul Hallock, superintendent of the course, was hired during the late stages of construction, when only two holes still had to be graded and seeded, so he focused mainly on preparing for the course's opening. In particular, he dedicated himself to the conditioning of the turfgrass.

"I needed to implement a proper fertilization and control product application program, which includes growth regulators, wetting agents and biostimulants," he explains. "I also had to develop consistent mowing strategies, including frequency and reduction of heights of cut. Due to the way the golf course was designed, mow lines (between fairways, roughs and naturalized areas) were blurred and had to be worked out over time."

Hallock and his crew decided to use a

PHOTO BY: NILE YOUNG / DAVE RICHARDS (PREVIOUS PAGE)

minimally designed Toro irrigation system, comprised of nearly 510 Infinity heads, decoders and a Lynx central control computer. In addition, the course has an 800-gpm Flowtronex pump station. As a result of the system's minimal design, the outer edges of the play lines are left "in the hands of Mother Nature for the most part," according to Hallock, as the double row on most fairways tapers to a single row around trees.

"Since we are still finishing the grow-in phase, it really is not a hole-by-hole monitoring, but rather an area-by-hole monitoring for plant health," Hallock says. "My overall water philosophy, which will be employed after the grow-in, is to water for health rather than color."

This philosophy certainly suits the course's links-style attributes, particularly regarding traditional links-style golf course management: low inputs of water, fertilizers and control products, along with constant monitoring for plant health and playability. Consequently, two words describe Stoatin Brae now: firm and fast.

PHOTO BY: DAVE RICHARDS

Stoatin Brae's minimally designed irrigation system leaves the native grasses surrounding each hole up to nature. Thinning out and pushing back these native grasses will take some time and patience, says Superintendent Paul Hallock.

"The course was seeded in with low-mow KBG fairways. These, in correlation with the clayey soils, mean that the course

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is really fast and firm when it's dry," says Jon Scott. "The roughs were seeded with a mix of KBG and fescues, as minimal watering allowed it to evolve into the turf that was most ideal for our links style."

Stoatin Brae's irrigation pond was installed away from the golf holes to preserve the natural design of the course. The construction crew drills a well in the pond (left), and the Gull Lake View crew installs the pond liner (right).

A unique mowing strategy

Since Stoatin Brae's grand opening this spring, Hallock and his crew have reduced irrigation frequency considerably, as they have less grow-in to complete. It continues to be watered for plant health and playability only, and is evaluated daily for areas that need — and perhaps more importantly, don't need — water.

Hallock also has a blend of low-mow bluegrass on fairways that, especially in the last two seasons, has proven to not only require low inputs of fungicides to control disease, but also provides a consistently healthy surface. With 45 acres of low-mow bluegrass blend of fairways, col-

PHOTOS COURTESY OF STOATIN BRAE GOLF CLUB

lars and approaches, Hallock also has decided to employ a unique mowing strategy on each of Stoatin Brae's fairways.

"We mow nine holes a day six days a week on an odd-and-even rotation," he states. "This allows us to mow fairways completely three times per week with two mowers and rarely ever be caught in play."

Hallock and his crew also mow 45 acres of fescue blend roughs with two 70-inch rough mowers, often twice a week. Because the rough is not irrigated much if at all, some spots typically need to be mowed only once per week. In fact, Hallock has reduced the frequency to bi-weekly mowing at times.

"On greens, which are T1 bentgrass, we mow three times a week at .125, roll four times per week and maintain a speed of 10.25 feet on a consistent basis," he adds. "With our undulated greens design, this speed is the most sufficient by far."

Thin native grasses, in due time

Golfer response to Stoatin Brae has been extremely positive so far. Aside from the course's freshness, and the fact that it will take some time to mature into the course that Scott and Renaissance Golf Design originally envisioned, Hallock's primary issue is thinning out and pushing back the native grasses heavily lining many holes.

These naturalized areas can be intrusive to play, leading to lost balls and frustrated golfers. To ease those frustrations, Hallock and his crew intend to evaluate these lines for potential reduction in some areas, as well as possible additions in other regions that are more out of play.

"I think most of the trial and error we have experienced comes from being impatient and acting off script," Hallock says. "I am a planner by nature, and have learned in my career that doing things on impulse — while it can get the job done — is usually less effective and efficient than having a solid plan."

Bearing in mind the course's playability for each customer, whether it's a well-experienced scratch golfer or a high handicapper new to the game, Hallock realizes that grow-in simply will take time and a lot of patience. Positive change regarding the naturalized areas, while not easy to recognize day to day, will occur in due time.

"We understand it's not fun to lose golf balls, but like everything new, it takes a while to get it just right," he stresses. "Most golfers see the vision and agree it is a special piece of ground. In a couple years, it's going to be unbelievable."

Michigan-based writer Chris Lewis is a frequent contributor to *Golfdom*. He recently wrote about sod farms using fungicides to strengthen planting stock.

BUILDING A STRONG CORE

As the author has learned, a 'next man up' mentality in the maintenance building is an insurance policy in which courses should invest.

BY CHRIS SORRELL, CGCS

Nothing dooms a golf course to obscurity more than the absence of a long-term, stable core of employees. A well-heeled employee core ensures maintenance and club management a continuous linear history of the relevant practices, maintenance issues and daily operations inherent in an operation. A superintendent who embarks on a new position where a core of employees is absent is going to have a trying time getting up to speed with course demands.

Unfortunately, I have a great deal of experience in this area.

BEEN THERE, DONE THAT

Every course that I have taken over as superintendent has been nearly or completely devoid of a core. This includes a rural course where new ownership felt the need to remove the long-time superintendent, a municipal course whose management company saved money by not replacing the superintendent and assistant for six months, and a daily-fee course whose massive course-wide turnover never allowed retention of employees long enough to develop a core.

In all these instances, the course suffered as its tangle of maintenance issues had to be unraveled without any significant guidance. The takeaway: Without development of a core of experienced employees, any golf course operation imperils itself.

A proper core of employees will be trained, by experience or direct tutelage, how to handle detailed issues that arise. These employees are insurance that little issues don't become big issues, and they also harbor explanations for why seemingly eccentric

practices are employed in place of more conventional ones. They are the stabilizing links in case of the unexpected absence of management. Without this safety net, the maintenance manager is forced to reinvent the wheel to come up to speed.

> "A PROPER CORE OF EMPLOYEES WILL BE TRAINED, BY EXPERIENCE OR DIRECT TUTELAGE, HOW TO HANDLE DETAILED ISSUES THAT ARISE. THESE EMPLOYEES ARE INSURANCE THAT LITTLE ISSUES DON'T BECOME BIG ISSUES."

RETAIN, RETAIN, RETAIN

Yet with all of its importance, little or no emphasis is regularly placed on this aspect of golf course management. It's a mistake made by course owners/operators/boards of directors, and only comes to light as a crisis.

Retaining quality employees is crucial to building a core. However, the seasonal aspect of work on a golf course acts as a significant obstacle to this effort. Current federal law requiring that all year-round employees be offered medical insurance — a cost that significantly affects the bottom line of any employer — makes the establishment of a core of employees even more difficult. The powers that be use the insurance issue as an excuse to put off or ignore the need for core development. The question we all need to ask: Are the risks of continuing to ignore this issue worth the reward?

THE COST OF RISK

There is no illusion here. The bottom line is always the deciding factor. A course can only afford what it can afford. A maintenance structure that employs a superintendent, two assistants, two second assistants and a mechanic as its core employees may be ideal, but also is unrealistic for a daily-fee course with a $160,000 maintenance budget. But it's just as unrealistic to have the superintendent as the only core employee in the maintenance division. All eggs in one basket risks a messy result.

In the event a hypothetical superintendent relocates, becomes infirm or even dies, the only hope for a replacement coming up to speed with the intricacies of the course is if the predecessor kept outstanding notes and records. And those only go so far. On site, daily experience from other employees is the ultimate assurance of a smooth transfer of authority and minimization of risk.

How much, you may ask, does risk cost?

Any time we ponder the application of an insurance product — which is how we should view an employee core — we must weigh the cost of the insurance against what the event insured against would cost. In this case, we are considering the cost of continued course maintenance operations/course business operations against the cost of employing individuals to assure a smooth transition if required.

Consider the risk involved if our hypothetical superintendent, who is the only core employee, is killed by a runaway beer truck after an early July delivery to the clubhouse. Who holds the pieces together at the course? Certainly, the most critical time is immediately after the tragedy, before a competent professional is recruited and takes over. But nearly as precarious are the weeks that follow. Warranting concern here are individual idiosyncrasies of irrigation systems, the variety of annual issues each turfgrass manager must deal with, and the menagerie of daily "gotcha" problems.

Add to these that this replacement superintendent must also become familiar with all operational processes, great or small, that exist at the course (sometimes a daunting task in itself). There are more than enough opportunities in all this for declining course conditions. Such deteriorating conditions only hurt a bottom line.

BY THE NUMBERS

Assume that during this hypothetical transition period, course conditions suffer. On a course with annual revenue of $1 million, a mere 3-percent reduction will mean a loss of $30,000. And that does not reflect additional losses that might follow if the organization's reputation becomes sullied, a situation that could take years to repair and includes countless lost revenue.

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ISTOCK.COM (MICHAELSVOBODA)

Without developing a core of experienced employees, any golf course imperils itself. Experience for other employees is the ultimate assurance of a smooth transfer.

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That $30,000, in many areas, is enough to employ a year-round assistant superintendent who, if trained properly, will be able to step into the vacant maintenance leadership role and employ on-site knowledge to hold the pieces together until a replacement is positioned and brought fully up to speed. Obviously, the $30,000 would be an additional budget expenditure, but it offsets the postulated risk. It is insurance.

AT THE CORE OF A CORE

What does a core of employees look like? Every course has variations, but a core begins with the superintendent, the assistant superintendent and the equipment manager.

As the lead of all things maintenance, the superintendent is the star of this show. However, a core is focused on making sure that continuity is maintained in the event of a superintendent's departure, so the role is less of a core member than a core facilitator. The superintendent ensures that the core can function, and that there is an assistant and an equipment manager. Both role players must be fully informed concerning processes that regularly occur on the course.

It's fair to assume the assistant is regularly involved in planning, assignment and execution of maintenance tasks. A bit more effort is required with the equipment manager, as their primary function is assuring a reliable maintenance fleet. Communication is the key here.

Beyond these key positions, further core employees easily could include full-time, year-round staff such as irrigation techs, spray techs or crew employees. All these positions, if provided with enough information, training and intentional retention, act as effective support personnel for an organization.

The core employee concept is a necessary long-game strategy for golf courses. Its "next man up" mentality insulates an organization from trouble. All core employees should be training their replacements. Every superintendent or general manager should have an assistant who can take their place in the event they are no longer willing or able to continue their work, and each of these assistants should have a crew member/foreman/second assistant who, in the same event, could competently perform their tasks.

The execution of this strategy affords a course better avoidance of failure. It's one more way to assure long-term success.

Chris Sorrell, CGCS, is superintendent of Stonebriar Country Club's Fazio Course in Dallas. This is the third time he has written for *Golfdom*.

PHOTOS BY: SETH JONES

Super Science

// LIVING IN THE LIVING ACRES

MONARCH (BUTTERFLIES) OF THE LINKS

By Renee J. Keese, Ph.D.

Monarch butterfly populations have been declining in the United States since the late 1990s. One of many factors contributing to the decline is the shrinking number of milkweed plants, which are critical to their reproduction cycle. The monarch migration starts in central Mexico and moves north in February, through the central and eastern parts of the United States. Migrating monarchs require milkweed plants for females to lay eggs and for food for the hatching larvae, or next generation.

The vast majority of monarch butterfly reproduction occurs in the northern/central region of the United States. Two to three generations of butterflies will procreate during the summer. By mid- to late August, the northern migration ends and monarchs begin their southern migration, returning to their winter roosting site by late autumn.

The Monarch Challenge aims to increase the monarch population by planting milkweed.

PHOTO COURTESY OF BASF

In 2015, BASF launched a biodiversity research initiative called Living Acres Monarch Challenge, focused on helping increase the monarch butterfly population by establishing milkweed in non-crop areas. The research, conducted on the BASF Research Farm in Holly Springs, N.C., provides best practices for establishing and maintaining the plants in non-production areas.

Because major stretches of golf courses lie within the monarchs' migration path, opportunities exist to create new monarch habitats in native or low-traffic areas on the course. In the spring of 2017, Lonnie Poole Golf Course, located at North Carolina State University in Raleigh, partnered with BASF Living Acres to plant approximately 750 milkweed plants and wildflowers in 15 native areas around the course to provide food and habitat for monarch reproduction. Volunteers, including BASF employees, assisted with planting these plots, and later released newly emerged monarchs onto the golf course.

As a Certified Silver Audubon Signature Course, Lonnie Poole GC is in an ideal location. It is committed to preserving the native habitat, and it's a model for the first of what may become many Monarch Challenge courses.

More golf courses can take part in the Monarch Challenge. To learn more about Living Acres and to download a brochure, visit **agro.basf.us/sustainability**.

Renee J. Keese, Ph.D., is BASF Biology Project Leader, Turf and Ornamentals.

NEWS UPDATES

UNIVERSITY OF ILLINOIS SHARES PRELIMINARY RESEARCH ON NEMATODES AND HOLGANIX

The University of Illinois at Urbana-Champaign recently released preliminary results from its research on nematode suppression with Holganix.

While studies are still ongoing, preliminary results have shown a 75-percent reduction in pathogenic nematodes with Holganix technology in a lab setting, and a 50-percent reduction in pathogenic nematodes in a field setting, according to Holganix. When specific to tomatoes and the root-knot nematode, Kris Lambert, Ph.D., associate professor at the University of Illinois' School of Crop Sciences, reports that he has seen zero root-knot nematodes in Holganix technology-treated tomato plants.

Lambert will need to replicate both the lab and field trials before drawing conclusive results regarding the effect, mechanism and application of Holganix technology when used as a treatment against pathogenic nematodes, according to a press release.

The company says it decided to invest in research to better understand the benefits of Holganix technology on pathogenic nematodes after some Florida superintendents reported positive results while using Holganix Golf.

Today, Holganix does not offer a registered nematicide product, and results on Holganix technology's influence over pathogenic nematodes are still pending.

"THIS INDICATES THE NEED FOR CONTROLLING ANNUAL BLUEGRASS EARLY IN THE LIFE OF A FAIRWAY, BEFORE POPULATIONS BECOME EXCESSIVE."

Matt Sousek
(see story on page 28)

//FROM GOOD TO GREAT

Controlling annual bluegrass where the buffalo roam

By Matt Sousek

Annual bluegrass (*Poa annua* L.) control has been thoroughly researched in cool-season turf east of the Mississippi River, but little research has been done in the northern Great Plains. Growing conditions, weather, desired species, as well as biotypes of annual bluegrass change dramatically as one moves west across the United States.

Because previous research and practical experience show that annual bluegrass response to herbicides varies widely among environments and/or biotypes, our objective was to evaluate the efficacy of herbicide programs for annual bluegrass control on fairways in Nebraska. We conducted two 3-year studies at Firethorn Golf Club in Lincoln, Neb., and Omaha (Neb.) Country Club.

A LITTLE BACKGROUND

In Nebraska and farther west, fairways mostly are Kentucky bluegrass (*Poa pratensis* L.), and in some areas this is overseeded with perennial ryegrass (*Lolium perenne* L.) after summer

TABLE 1

Means for percent cover of annual bluegrass during and after three years of herbicide applications; *Poa annua* Progress Curve (AUPPC) after three years of herbicide applied to annual bluegrass on a

		Application date				Aug 2010†	May 2011	Aug 2011	
Treatment	Rate/A	24 Aug±2d	4 Oct±3d	17 Oct±2d	3 Nov±3d	percent cover‡			
Tenacity	8 fl. oz.	PRE				13#††	21	13	
Tenacity	8 fl. oz.	PRE			PRE/POST	12	14	8	
Barricade	16 oz.	PRE				16	27	11	
Barricade	16 oz.	PRE			PRE	17	21	6	
Tenacity	5.33 fl. oz.		POST	POST	POST	16	11	6	
Tenacity	8 fl. oz.		POST	POST		19	19	8	
Prograss	64 fl. oz.		POST	POST	POST	16	15	7	
Barricade Tenacity	16 oz. 5.33 fl. oz.	PRE	POST	POST	POST	15	9	3	
Barricade Prograss	16 oz. 64 fl. oz.	PRE	POST	POST	POST	14	11	6	
Barricade Tenacity	16 oz. 5.33 fl. oz.	PRE	POST	POST	PRE POST	13	6	2	
Barricade Prograss	16 oz. 64 fl. oz.	PRE	POST	POST	PRE POST	15	17	5	
Untreated	–					14	19	8	

† August 2010 ratings were taken prior to initiation of treatments.

‡ Annual bluegrass cover was estimated visually in May and with vertical point quadrat method in August where a 5 ft.-by-5 ft. frame was laid over the plots with an interval filament grid of 64 intersections. The total number of times annual bluegrass was present under each intersection was recorded for each plot and percentage cover was calculated.

§ Percent change from the initial annual bluegrass cover, calculated as [((annual bluegrass cover Aug 2013–annual bluegrass cover Aug 2010)/ annual bluegrass cover Aug 2010))*100)]. These means were calculated on a per-plot basis and thus may differ slightly from calculations based on treatment means due to plot-to-plot variation.

¶ Area under percent *Poa* curve (AUPPC) calculated from all visual ratings and vertical point quadrat measurements of percent cover from study initiation through the final rating in Aug 2013.

Means of three replications

†† Means within a column followed by the same letter are not significantly different according to Fisher's least significant difference at $P \leq 0.05$.

damage. Annual bluegrass control hasn't been thoroughly researched in Kentucky bluegrass fairways. Researchers have shown that Tenacity (mesotrione, Syngenta) has potential as a postemergence herbicide to control emerged annual bluegrass. However, Tenacity's label does not specifically list postemergence control of annual bluegrass. However, it is labeled for preemergence suppression of annual bluegrass and for use on Kentucky bluegrass fairways.

Work in Indiana and Illinois indicated that optimum annual bluegrass control in the fall resulted from three applications of Tenacity at 3 or 5 fl. oz./acre/applied at 14-day intervals, starting in mid- to late September. Three fall applications of Prograss (ethofumesate, Bayer) has been the standard for controlling annual bluegrass in Kentucky bluegrass and/or perennial ryegrass fairways.

Some fairways in Nebraska and farther west are creeping bentgrass (*Agrostis stolonifera* L.). In creeping bentgrass, Velocity (bispyribac-sodium, Valent) currently is the industry standard for postemergence annual bluegrass control and has been thoroughly researched. Multiple applications on 2- to 3-week intervals are highly effective for annual bluegrass control, and Velocity becomes more effective on annual bluegrass and less phytotoxic on creeping bentgrass at temperatures above 68 degrees F. Current label recommendation for Velocity 17.6WSP is up to four applications at 6 fl. oz./acre applied at 21-day intervals on fairways with relatively low populations of annual bluegrass. Unfortunately, the status of Velocity currently is questionable as Valent is reassessing the herbicide in the turf market. Hopefully, Velocity will remain a viable option for superintendents.

percent change from initial percent cover and Area Under the Kentucky bluegrass fairway in Lincoln, NE.

May 2012	Aug 2012	May 2013	Aug 2013	Aug 2013	Aug 2013
percent cover†				percent change§	AUPPC¶
19 bc	0	53 a	38 a	206 a	21092 ab
11 cd	0	36 ab	30 ab	185 a	14856 a-d
20 abc	0	16 bc	17 bcd	8 bc	15972 a-d
26 ab	0	24 bc	16 bcd	-6 bc	17349 a-d
17 bc	0	8 c	8 d	-46 bc	12969 a-e
34 a	0	8 c	7 d	-58 c	18577 abc
22 abc	0	9 c	13 cd	-16 bc	14331 a-e
9 cd	0	7 c	3 d	-76 c	6910 de
16 bcd	0	16 bc	14 cd	5 bc	10931 b-e
3 d	0	5 c	2 d	-78 c	3803 e
9 cd	0	10 c	6 d	-65 c	8694 cde
29 ab	0	46 a	25 abc	85 ab	22652 a

HOW WE DID IT

Kentucky bluegrass fairways

The Kentucky bluegrass study was located at Firethorn Golf Club and used a low-mow Kentucky bluegrass blend (NuDestiny, Everglade, 4 Season, Solar Eclipse and Beyond) seeded in 2009. Soil type was Aksarben silty clay loam, and maintenance included mowing three times per week at 0.50 inch with clippings returned, 2 lbs. nitrogen (N)/1,000 sq. ft./year, preventative white grub control and Dimension (dithiopyr, Dow AgroSciences) applied in spring for crabgrass control. The Kentucky bluegrass study consisted of 11 late-summer and fall treatments, including combinations of herbicides applied as preemergence Barricade 65WDG (prodiamine, Syngenta) or Tenacity and/or postemergence (Tenacity or Prograss 1.5EC) for annual bluegrass control (Table 1). A non-ionic surfactant (Induce, Helena Chemical) was included with all Tenacity applications at 0.25 percent v/v. We applied treatments starting in August 2010, with identical treatments repeated in 2011 and 2012 over the same plots.

Creeping bentgrass fairways

The creeping bentgrass study was located at Omaha Country Club, which has approximately a 5-year-old creeping bentgrass blend (T1, Alpha and Crenshaw). Soil type was a Monona

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silt loam, and maintenance included mowing three times per week at 0.375 inch, with clippings collected, 2.4 lbs. N/1,000 sq. ft./year, preventative disease and white grub control, and Dimension applied in spring-split applications for crabgrass control. We also topdressed this area four times annually and aerated twice a year with solid tines to a depth of 5 or 8 inches. The creeping bentgrass study was a 2 X 2 X 2 factorial with two rates of Velocity 17.6 WSP (4 fl. oz./acre + 4 fl. oz./acre applied three weeks apart and 6 fl. oz./acre + 6 fl. oz./acre applied three weeks apart), two applications of Velocity (mid-June plus three weeks and mid-June plus three weeks and mid-September plus three weeks) and two levels of preemergence herbicide (none or Dimension 2EW at 24 fl. oz./acre applied early September) (Table 2). This study also included an untreated control and a Dimension-only treatment applied in early September. Treatments were applied in 2011, 2012 and 2013 over the same plots.

We recorded annual bluegrass cover prior to the first application and then throughout the study until spring after the last application. Like long-term disease studies in which scientists combine all readings into a single data point called AUDPC (Area Under the Disease Progress Curve), we also combined all of our readings into a single mean as AUPPC (Area Under Percent Poa Curve). We analyzed all data with SAS and separated means with Fisher's least significant difference (LSD) at $P \leq 0.05$.

WHAT WE FOUND

Kentucky bluegrass fairways

Annual bluegrass in untreated control plots increased from 14 to 25 percent cover during the 3-year experiment, an increase of 85 percent (Table 1). This indicates the need for controlling

TABLE 2

Means for percent cover of annual bluegrass, percent change from initial percent cover and Area Under the *Poa annua* Progress Curve (AUPPC) after three years of herbicide applied to annual bluegrass on a creeping bentgrass fairway in Omaha, Neb. The experiment was in a factorial design, so means are averaged over many treatments.

	Percent annual bluegrass cover							Percent change from initial[§]	AUPPC[¶]
	May 2011[†‡]	Sept 2011	Apr 2012[‡]	Oct 2012	May 2013[‡]	Oct 2013	May 2014[‡]	May 2014	May 2014
Timing of Velocity	**Percent cover**							**Percent**	**Percent days**
June	34[#]	7	26	3	8	3	5	-85	10522
June + Sep	31	4	15	1	3	1	1	-98	5925
Addition of Dimension to Velocity									
Velocity alone	32[††]	6	19	2	7	3	3	-91	8365
Velocity + Dimension applied in Sep	33	6	22	2	5	1	3	-92	8082
Untreated control[‡‡]	32	22	43	14	31	20	14	-53	26166
Dithiopyr only[‡‡]	29	22	44	17	39	23	16	-44	28352

[†] May 2011 ratings were taken prior to initiation of treatments.

[‡] Annual bluegrass cover was estimated visually in fall and with vertical point quadrat method at peak seedhead cover in spring where a 5 ft.-by-5 ft. frame was laid over the plots with an interval filament grid of 64 intersections. The total number of times annual bluegrass was present under each intersection was recorded for each plot and percentage cover was calculated.

[§] Percent change from the initial annual bluegrass cover, calculated as [((annual bluegrass cover in final spring rating - annual bluegrass cover in initial spring rating)/annual bluegrass cover in initial spring rating)) *100]. These means were calculated on a per-plot basis and thus may differ slightly from calculations based on treatment means due to plot-to-plot variation.

[¶] Area under percent *Poa* curve (AUPPC) calculated from all visual ratings and vertical point quadrat measurements of percent cover from study initiation through the final rating in May 2011.

[#] Means of two rates, two levels of PRE, and three replications

[††] Means of two rates, two levels of applications, and three replications

[‡‡] Untreated and Dimension only means were not included in the factorial analysis and thus are shown for reference only.

annual bluegrass early in the life of a fairway, before populations become excessive. No treatment effects were visible until May 2012 (Table 1), which was after the second year of treatments. Record-high summer temperatures in 2012 reduced annual bluegrass cover to zero in all plots by August 2012. These two observations reinforce the usefulness of long-term annual bluegrass studies in climates like the northern Great Plains, with dramatic weather fluctuations that could confound treatment effects.

Three postemergence applications of Tenacity plus preemergence Barricade applied in August or August and November reduced annual bluegrass cover compared to the untreated control in May 2012 and 2013 and August 2013, and reduced final annual bluegrass cover by more than 75 percent since study initiation (Figure 1). These same two treatments also reduced AUPPC by 69 percent to 83 percent compared to the untreated control.

Three postemergence applications of Prograss plus preemergence Barricade applied in August and November also reduced annual bluegrass cover compared to the untreated control in May 2012 and 2013 and August 2013; reduced final annual bluegrass cover by more than 65 percent from study initiation; and reduced AUPPC by 62 percent compared to the untreated control. Even though many other treatments performed similarly, these were the only three to reduce final annual bluegrass cover and AUPPC compared to the untreated control.

Our data reinforce that Tenacity has potential for controlling annual bluegrass in the northern Great Plains of the United States. We likely could have improved efficacy of postemergence applications of Tenacity with more frequent applications at lower rates or by increasing the amount of N applied with or shortly after application. Tenacity applied alone as a preemergence had little effect on annual bluegrass, as Tenacity applied once as a preemergence in August was the only treatment that did not affect annual bluegrass cover at any time during the study (Table 1).

Tenacity applied as a preemergence in August and as a pre/postemergence in November reduced annual bluegrass cover compared to the untreated control rated in May 2012, and thus the November application provided some postemergence control. Annual bluegrass on this site appeared to be mostly *Poa annua* var. *annua* because it was fairly coarse textured, light green, and a prolific seed producer. However, the annual bluegrass on this site may have

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FIGURE 1

Control of annual bluegrass by preemergence and postemergence herbicide applications in the Kentucky bluegrass experiment in May 2013.

FIGURE 2

Control of annual bluegrass by postemergence herbicide applications in the creeping bentgrass experiment in May 2013.

PHOTOS BY: ZAC REICHER (FIG. 1); MATT SOUSEK (FIG. 2)

Continued from page 31

included some *Poa annua* var. *reptans,* since preemergence applications of Barricade alone were ineffective. This especially was apparent between August 2012, when no annual bluegrass was visible, and May 2013, when up to 24 percent annual bluegrass was present despite one or two applications of Barricade. This also could suggest that smaller (one- to three-leaf stage) plants of annual bluegrass were present below the Kentucky bluegrass canopy on the August 2012 rating date, and were not affected by Barricade.

Creeping bentgrass fairways

Unlike the Kentucky bluegrass study, annual bluegrass cover did not drop precipitously during the record-high temperatures of summer 2012, with cover in the untreated control at 14 percent in October 2012 compared to 22 percent and 20 percent in September 2011 and October 2013, respectively (Table 2). This could be due to irrigation and aggressive fungicide use, or possibly that the annual bluegrass on this area was *Poa annua* var. *reptans.* However, annual bluegrass did decline during winter of 2013-14, with only 14 percent annual bluegrass cover in the untreated control in May 2014 compared to 32 percent, 43 percent and 31 percent annual bluegrass cover rated the previous three springs. Desiccation of annual bluegrass was extensive in Nebraska and the northern Great Plains during the winter of 2013-14. This reiterates the importance of long-term annual bluegrass control studies because single-year studies replicated over time or space may dramatically be affected by weather.

Velocity was extremely effective in this study, reducing annual bluegrass cover to less than 5 percent by the end of the study, compared to 14 percent cover in the untreated control (Table 2). Two applications of Velocity in June reduced annual bluegrass cover throughout the study and reduced AUPPC by 60 percent compared to the untreated control. Adding additional September applications further increased annual bluegrass control, reducing annual bluegrass cover on every rating date, final annual bluegrass cover by an additional 13 percent and AUPPC by 45 percent compared to the June-only applications (Table 2). However, there never was an effect of increasing the rate of Velocity from 4 to 6 fl. oz./acre/application, and there was only one rating date (Oct. 2013) where adding a pre-application of Dimension reduced annual bluegrass cover. The lack of preemergence control further suggests that the annual bluegrass on this site was mostly *Poa annua* var. *reptans.*

SUMMARY

Three fall postemergence applications of Tenacity plus Barricade applied as a preemergence in August and/or November was effective in controlling annual bluegrass on Kentucky bluegrass fairways. Replacing Tenacity with Prograss also was effective and would be a means of reducing the chances of annual bluegrass developing herbicide resistance by using herbicides with different modes of action. Velocity applied twice two weeks apart at 4 oz./acre in June was effective for controlling annual bluegrass in creeping bentgrass fairways. Control was improved by adding two additional applications of Velocity in September, but there was no benefit in using the 6 fl. oz./acre rate over the 4 fl. oz./acre rate. Our data confirm that annual bluegrass control research done in other areas of the country is applicable to Nebraska and likely the rest of the northern Great Plains. However, weather extremes in summer or winter in the northern Great Plains may dramatically affect expected annual bluegrass control in any given year.

Acknowledgements

Special thanks to Scott Wilke at Firethorn Golf Club and Eric McPherson at Omaha Country Club for generously allowing us almost unlimited access to their golf courses. Thanks also go to the Nebraska Turf Association for partial funding for this study.

Matt Sousek is manager of the John Seaton Anderson Turfgrass Research Center at the University of Nebraska and can be reached at msousek2@unl.edu for more information. You may obtain the original article from the author or at Reicher, Z., M. Sousek, and M. Giese. 2017. Herbicide Programs for Annual Bluegrass (*Poa annua* L.) Control in Nebraska. *Crop, Forage & Turfgrass Management* 2017 3:1-. doi:10.2134/cftm2015.0221

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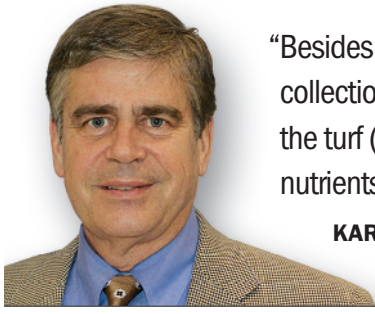

"Besides not having to deal with large leaf collection, mulching returns leaves into the turf (if done frequently enough) and nutrients, primarily nitrogen, are recycled."

KARL DANNEBERGER, PH.D., *Science Editor*

Bring autumn color to turf

Autumn is the best time to work on a golf course. The days are shorter, the mornings cooler, the air clear. The colors on a course are the most striking. The green turf contrasts strikingly with the changing leaves of trees and ornamentals. For those who enjoy photography, the morning sunrise brings these colors into focus.

Fall leaves provide a color contrast — reds to burgundy to orange — but what do we do with them once they fall to the ground? In golf, leaves are nuisances that can cover a golf ball. In conjunction with the leaves, the low sun angle causes a lighting effect that makes finding a ball more difficult. There's only one thing worse than looking for your golf ball, and that's looking for someone else's.

Superintendents spend considerable time and effort collecting and removing leaves, and there are agronomic advantages to doing so. Leaf removal reduces potential shading of turf. The microclimate effect of shading can reduce turf photosynthesis and make annual bluegrass susceptible to certain types of winter injury.

Reduced light limits photosynthetic potential, resulting in lower carbohydrate storage, which plants might need to survive the winter. Internally, especially with annual bluegrass, plant mechanisms that play a role in cold tolerance can be affected by leaf cover, resulting in a loss of cold and freeze tolerance.

The problem with collecting and removing leaves is what to do with them. You can haul them off, burn them or recycling through composting. All these methods take time and effort.

Because most leaves fall in the rough, mulching is a possibility. Several manufactures sell mulching attachment kits for rough (rotary) mowers. Besides not having to deal with large leaf collection, mulching returns leaves into the turf (if done frequently enough) and nutrients, primarily nitrogen, are recycled.

Nitrogen being released and returned for turf growth depends on the carbon-nitrogen (C-N) ratio. Soil microorganisms use carbon for energy and nitrogen for maintenance and growth. Within microbes, a C-N ratio of 8-to-1 is ideal for living. For soil to acquire the carbon and nitrogen necessary to maintain an internal 8-1 ratio, the microorganisms ideally are at a C-N ratio of 24-to-1.

If we add organic material to be degraded by these soil organisms, it's the C-to-N ratio that determines whether nitrogen is released or captured. For example, if we add wheat straw with a C-N ratio of 80-to-1 to our turf, soil microorganisms will consume the carbon but will need to find extra nitrogen in the soil. The result of consuming extra nitrogen is known as immobilization. Immobilization ties up extra nitrogen in soil, making it unavailable for plant growth. This may lead to a temporary nitrogen deficiency.

In contrast, if we were to add grass clippings with a C-N ratio of 19-to-1, soil microorganisms would consume the leaves and release extra nitrogen (mineralization), resulting in a temporary soil nitrogen surplus. With grass clippings having a C-N ratio close to 24-to-1, the amount of excess nitrogen immediately released might be minimal (although the nitrogen eventually would be released). However, because of the C-to-N ratio, grass clippings are readily broken down in a short time.

In general, if the C-N ratio is greater than 30-to-1, nitrogen immobilization occurs as maximum biological activity is reached. With C-N ratio less than 20-to-1, we reach mineralization of nitrogen with maximum biological activity.

The C-N ratio in leaves is around 50-to-1. The breakdown of leaves is considered intermediate between grass clippings and wheat straw. Leaves range from sugars (quickly broken down) to cellulose (intermediate) to lignin (slowly broken down).

Because roughs are to some extent fertilized, leaves especially mulched or repeatedly chopped with a mower can break down rather quickly. Where rough areas exist that accumulate leaves, mulching is a sustainable method of management.

Karl Danneberger, Ph.D., *Golfdom*'s science editor and a professor at The Ohio State University, can be reached at danneberger.1@osu.edu.

Natural capital on golf courses

Eric Lonsdorf, Ph.D., is a lead scientist at the University of Minnesota's Institute on the Environment (IonE). IonE's Natural Capital Project seeks to understand and inform people about the benefits nature provides to society. You may reach Eric at lons0011@umn.edu for more information.

Q Describe natural capital as it pertains to a golf course.

Natural capital is a novel way to view the impacts and benefits that the natural environment provides to society. On a golf course, examples of natural capital include stormwater retention, filtering water, recharging groundwater, open space, habitat for wildlife and promoting biodiversity.

The University of Minnesota is collaborating with the USGA to fully explore how golf courses impact natural capital, and to attach an economic value to that natural capital. We want to estimate the full economic value of a golf course beyond the game of golf.

The motivation for the project is to provide a complete picture of the economic value of a golf course, including the natural capital, so a community can make informed decisions when discussions occur about the value and benefits of a golf course.

Q How can natural capital be quantified and an economic value established?

Conceptually, it makes sense to quantify natural capital and the associated economic value. In practice, it is a challenge to do so.

The two components of establishing the economic value of natural capital on a golf course are understanding the biophysical (ecological) characteristics of the site or feature of interest and evaluating the economic consequences of that feature.

Two non-golf examples illustrate ways to establish economic value of natural capital. Our team worked on a project to determine the importance of water clarity in lakes, and determined that increased water clarity leads to more visitors using the lake. The team quantified the number of visitors using the lake, and from that we established the economic value of water clarity. A second example is pollination of fruit by wild bees. We've learned that as the number of wild bees increases on fruit farms, fruit yields on those farms increase. From this increase in fruit yield and the corresponding increase in value, we could determine the economic value of wild bees.

Q What can golf course superintendents do to enhance natural capital on their golf course?

The first step is to think broadly about the golf course, the maintenance practices of the golf course and the role of the golf course in the community.

NATURAL CAPITAL EXISTS ON ALL GOLF COURSES, WHETHER IT IS MEASURED OR NOT. GOLF COURSE SUPERINTENDENTS AND LEADERS SHOULD INTEGRATE NATURAL CAPITAL INTO ALL DECISIONS.

Consider all the ways the golf course impacts the community, including golf and the non-golf benefits I mentioned earlier.

One example is determining which parts of the golf course are used by golfers when playing golf and which parts of the golf course are maintained as playable turf that golfers rarely, if ever, encounter when playing. We can determine this by asking golfers to slip a GPS tracker into their pocket before playing, then downloading the information concerning where they played their shots from at the end of the round. Pooling the data from where 50 or 100 or more golfers of varying ability played their shots from provides insight into where to prioritize maintenance. It may be possible to convert some areas of maintained turf into other types of vegetation, such as a woodland, prairie, naturalized area or wetland.

Some golf courses have established honey bee colonies on the golf course and pollinator gardens to help support the honey bees. These efforts create a direct connection that helps golfers and the public understand that a golf course provides benefits in addition to the game of golf.

Q Is there anything else you would like to add?

Natural capital exists on all golf courses, whether it is measured or not. Golf course superintendents and leaders at the golf course should integrate natural capital into all decisions. The golf course is part of the community, and it's important to be a positive member of the community.

Clark Throssell, Ph.D., loves to talk turf. Contact him at clarkthrossell@bresnan.net.

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*Erin Hills' Superintendents, left to right: Assistant **Alex Benson-Crone**, Director of Grounds **Zach Reineking**, Associate **John Jacques**, and Assistant **Adam Ayers**.*

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What can I get you? I'll have an Arctic Blitz Gatorade.

Tell me about your family. I've been married to my wife, Natalia, for 10 years. Jacob is 8, Andrew is 6 — they're my baseball stars. And Sofia is 3 months old.

Wow, congratulations! Thanks. Having a girl in the family is a very big deal for my wife — she's been surrounded by boys for the last several years. She already went out and got her a Halloween costume — a unicorn.

What teams do you root for? The Buckeyes, the Indians and the Cavs.

What was on the radio this morning on the drive to work? Lynyrd Skynyrd, "Simple Man."

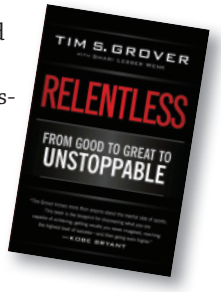
How long was the drive? Only eight minutes. I live about two miles from the course. It's eight minutes in the morning, but in the afternoons with Atlanta traffic, it can be 20 minutes.

How do you like living in Atlanta? Being from Ohio, and after 15 years in south Florida, it's nice to have the four seasons back. The airport is great, the outdoors opportunities are fun and they have an amazing youth baseball program here. But the best thing is southern hospitality.

What's your favorite tool in the shop? Is it OK if I say my phone? I can run irrigation from it, I can manage my labor with it from OnGolf, even our TDR moisture meters are Bluetooth and upload to my phone.

What's the strangest or most useless thing you keep in your office? They're one and the same. I have an old sand hourglass on my desk, it takes 10 minutes for the sand to run out. I tell sales reps when they come in that they have that much time, but somehow they always manage to ignore it.

Have you read any good books lately? Yes! *Relentless: From Good to Great to Unstoppable* by Tim S. Grover. It's written by this trainer who has worked with a bunch of athletes — LeBron James is one — and he talks about what makes them relentless. It's a sports-based book, but to me, in our jobs, that word 'relentless' is what we have to be. The book is a bit blunt, it's not for the politically correct crowd.

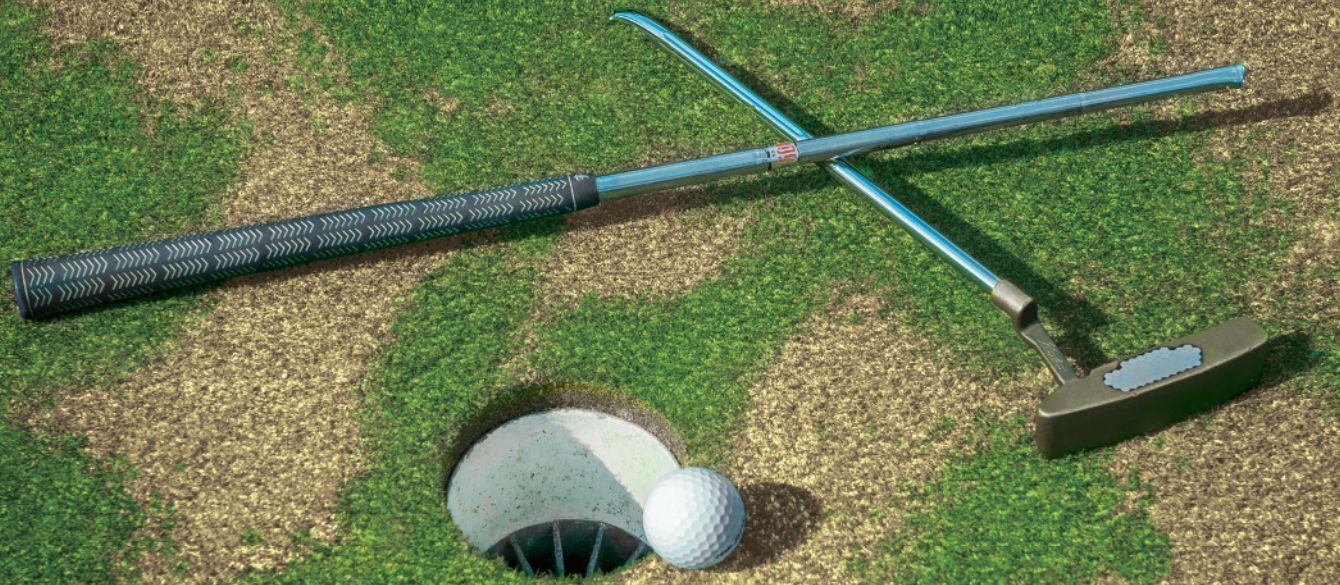


When you spoke at the Green Start Academy, you told the group that it's important to have fun. Are you still able to have fun at a high-pressure place like Atlanta Athletic Club? Absolutely. Life is what you make of it. Stress is self-created. Now, the parentheses to that statement is that sometimes you have to find your fun away from work… but you have to have fun one way or another.

As interviewed by Seth Jones, Oct. 20, 2017.

MAIN PHOTO BY: GRANT B. GANNON

NO ONE CAN PUTT WHILE PYTHED.



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