

**PLUS**  
FIGHTING FAIRY RING  
UNDERCOVER SUPERINTENDENT  
2011 PGA: WHERE ARE THEY NOW?

# Golfdom

11.16

## GAME ON!

*"I am a woman, I am a Millennial,  
I am a minority... I do take the responsibility  
of growing the game of golf very seriously."*

—TOPGOLF'S JEEHAE LEE

**JEEHAE LEE**, Yale grad,  
former LPGA player and  
now Topgolf's director  
of business strategy, in  
between swings  
at Topgolf Allen.

# “Preliminary tests indicate increased rolling frequency reduces dollar spot.”

–University of Massachusetts, Stockbridge School of Agriculture

For years, rolling was just for greens. Today you could be in for a big surprise. Preliminary testing shows that rolling fairways suppresses dollar spot, reduces time spent cutting which in turn reduces wear and tear on machinery and cuts labor costs.



Geunhwa Jung and Jay Popko  
Stockbridge School of Agriculture

## TEST SUMMARY TO DATE

- Plots were unrolled • Rolled 3 times/week
- Rolled 4 times/week (Double roll 2 days) • Rolled 6 times/week (Double roll 3 days)

Initial Results: Increased rolling frequency reduced dollar spot (40-60% in 2015).

Clipping yields were reduced and positively correlated with increased rolling frequency.

Different fungicide spray schedules were also tested (Threshold vs Calendar at 21 days interval) and initial results indicate rolling can reduce fungicide applications if threshold-based spray programs are used. This should be a major cost reduction if second-year test plots confirm this.

We also observed less thatch depth where rolling was performed, again, directly correlated to frequency but wasn't quantified at this time. Soil penetrometer tests confirmed that rolled plots had higher resistance to penetration.

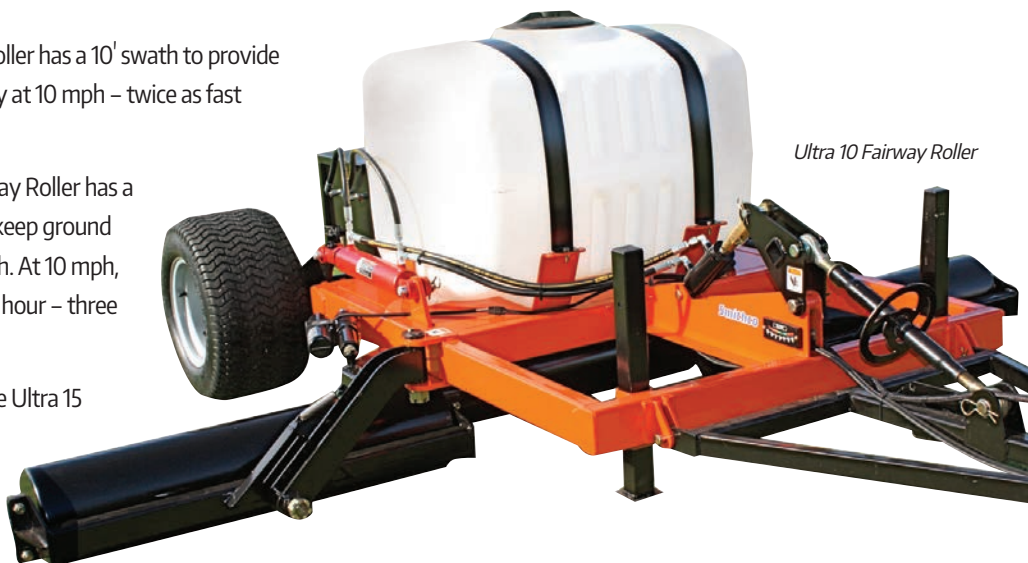
We presume ball roll will be increased, however further studies are needed to evaluate these affects. Additional studies will be performed this year.

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# For its ninth U.S. Open, Oakmont trusted **Lexicon**<sup>®</sup> **Intrinsic**<sup>®</sup> brand fungicide



*John Zimmers,  
Superintendent,  
and David Delsandro,  
Director of U.S. Open  
Operations and Projects,  
Oakmont Country Club*

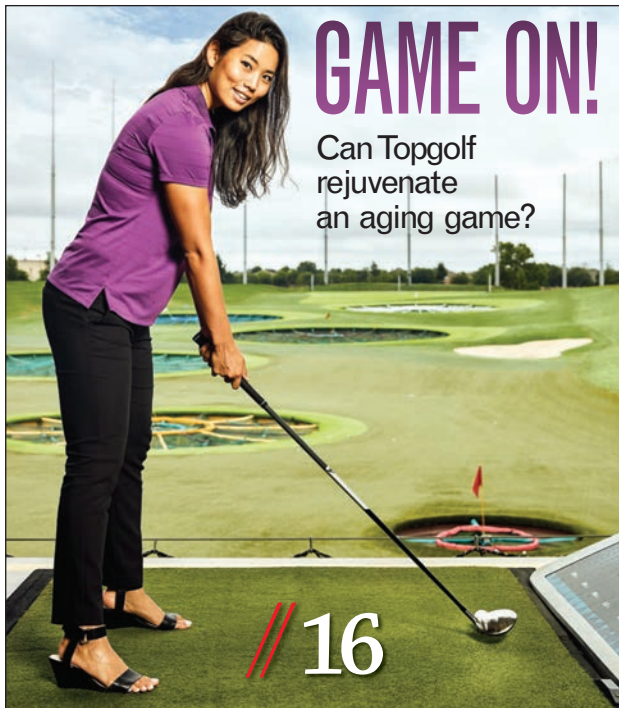
The pressure was on. As David Delsandro prepared for Oakmont's ninth U.S. Open, he turned to **Lexicon Intrinsic** brand fungicide. This foundational product for greens provides control of 27 diseases for up to 28 days, plus plant health benefits. John Zimmers said, "In my 17 years here, we produced some of the best roots, which helped deliver exceptional turf."

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## Five years later

Career advice from the 2011 PGA Championship crew, now successful superintendents



## COLUMNS

- // 6 **Keeping up with The Jones**—Seth Jones
- // 10 **I'm Just Saying**—Steve Wright
- // 13 **From the Back Tees**—Joel Jackson
- // 15 **Who's Your Buddy**—Grant B. Gannon
- // 36 **The Turf Doc**—Karl Danneberger
- // 37 **Clark Talks Turf**—Clark Throssell



## DEPARTMENTS

- // 8 **Starter**
- // 12 **Golfdom Gallery**
- // 14 **The Golfdom Files**
- // 38 **Professional Grade**
- // 40 **The 19th Hole**

## SUPER SCIENCE

- // 31 **The nitrogen/sun connection**
- // 32 **Dr. *basidiomycetes* or: How I learned to stop fairy ring**





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“So, if I’m not into video games and I’m not into simulator golf, you would probably guess I’m not a huge fan of playing Topgolf. And you’d be right.”

**SETH JONES**, *Editor-in-Chief*

## Bells and whistles and a light show

I have never been a video game guy. Not necessarily by choice, but more likely because when I was a kid my parents refused to buy me a Nintendo or Sega. ¶ They did buy me the Intellivision game system out of the Sears catalog one Christmas. A few years later Nintendo was released, making the Intellivision painfully obsolete. Right then and there my dad decided he wasn’t going to waste any of his hard-earned money on video games again.

I’ve also never been into simulator golf. It’s just not the same as real golf. But then there was the winter I tried to use one to stay in golf shape (if there is such a thing), and skulled a 5-iron into the PVC pipe that hangs from the bottom of the screen. The ball ricocheted into my ankle and left me in a crumbled heap on the floor. (I’m sure hundreds of people have been injured playing simulator golf, but I might be the only one to publicly admit it. It’s an epidemic, people.)

So, if I’m not into video games and I’m not into simulator golf, you would probably

guess I’m not a huge fan of playing Topgolf. And you’d be right.

It looks cool, it’s a fun scene, the food is good. I’d just rather be playing golf.

I asked a lot of people for their takes on Topgolf. One was Woody Moriarty at Blue Hills CC in Kansas City, Mo. (He’s our 19th Hole interview this month.) He told me, “I’m just not into it. I like the environment of being outside and playing golf, not hitting into a bunch of bells and whistles or a light show.”

Love it. Pretty sure that when he got home that evening he yelled at some kids to

get off his lawn, right?

Then I talked to my friend’s son, Christopher Lipford, a 16-year-old high school junior who has played Topgolf around 15 times, traditional golf maybe five times. While he enjoys the challenge of golf, Topgolf is easier for him and his friends to visit on a whim. Plus, “I don’t have to wear golf clothes to Topgolf,” he told me, “and I feel more welcome there than at the golf course.”

Ironic, as the one golf course he’s ever played is a course called “Smiley’s.”

While on some level I agree with Woody, I also can’t argue

with the way Christopher and his friends feel about walking into a pro shop. Topgolf is exposing millions to the feeling that hitting a golf ball can be a really good time. But how do we bring their laid-back customers to the actual golf course?

Whenever I speak at a chapter event, I always ask the chapter to give me a few story ideas. Topgolf and what it means to the traditional game comes up every time, guaranteed. It’s an interesting concern from superintendents since there isn’t a blade of natural grass out there. (OK, two Topgolfs have some natural grass, and another, as you’ll read about in the story, will be conjoined with an actual golf course.)

This month’s cover story isn’t about video games or simulator golf, and it’s certainly not about maintaining turf. This story is about how golf is (and isn’t) evolving, and one way we might create new golfers from a generation that doesn’t seem to have the time or the patience for golf.

Though I’m not a Topgolf nut, I enjoyed writing this story and learning more about the company, its goals and how industry pundits believe it might affect the game we all adore. As for this Topgolfer cynic? I say thank you, Topgolf, for getting more people out there hitting golf balls.

Now it’s up to us to find a way to get those same people to hit one on our golf courses. Our jobs depend on it.

Email Jones at: [sjones@northcoastmedia.net](mailto:sjones@northcoastmedia.net).



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# Starter

NEWS, NOTES AND QUOTES



## // CONSOLIDATION



With the union of the two companies, Jacobsen will shut down its Charlotte, N.C., production facility and move its operations to Textron Specialized Vehicles' headquarters in Augusta, Ga.

## TEXTRON SPECIALIZED VEHICLES AND JACOBSEN TO COMBINE

CHARLOTTE, N.C., JACOBSEN PLANT TO CLOSE IN 2017

➔ Textron Inc. announced in a statement that the company will combine the operations of its subsidiary companies Textron Specialized Vehicles Inc. (TSV) and Jacobsen and cease operations in Charlotte, N.C., by the close of 2017.

The marriage of the two companies will allow them to better serve their shared customers in golf and other industries, and operate more efficiently through a common supply chain and efficiencies of scale in manufacturing and back-office operations, according to the company.

"The combination of Textron Specialized Vehicles and Jacobsen will be nimble, optimally sized, and well equipped to meet the evolving needs of our customers," Kevin Holleran, presi-

dent and CEO of Textron Specialized Vehicles Inc., said in the statement. "We are working carefully to ensure a seamless transition that is invisible to customers. We will maintain the level of support and service — before, during, and after the sale — that both Jacobsen and TSV customers expect and demand."

As part of the integration, Jacobsen's operations in Charlotte, N.C., will relocate to TSV facilities in Augusta, Ga., with the first phase of relocation expected to be completed by the end of March, and all operations planned to be relocated by the close of 2017. Jacobsen's field sales and service teams will remain in place, and it will continue operations in Coatesville, Ind. and Ipswich, U.K.

## // DEPARTMENT OF LABOR

### TIMEOUT ON NEW OVERTIME RULE?

In the August *Golfdom* we reported on a new overtime rule from the U.S. Department of Labor set to go into effect on Dec. 1 that would pay more salaried workers overtime. Currently, salaried workers making \$23,660 and under are entitled to time-and-a-half overtime pay. The new rule would up that number to those making \$47,476 and under.

The United States House of Representatives recently passed a bill that would delay the effective date of the Department of Labor's new overtime rule by six months, from Dec. 1, 2016, to June 1, 2017. That doesn't mean the delay will actually happen.

The bill must now survive the Senate, and if it makes it that far, it must also survive a veto from President Barack Obama. Meanwhile, another bill is circulating that proposes the new rule be phased in over a three-year period.

According to Chicago-based law firm Franczek/Radelet, most legal observers are advising employers to be prepared for the new rule to take effect on Dec. 1, 2016.



## // BIG EAST

### PBI-GORDON ADDS RIECK

PBI-Gordon Corp. has named Brett Rieck the eastern regional manager of its sales team. Rieck will supervise the company's eight territory sales representatives serving clients and vendors east of the Mississippi River.



Brett Rieck

Rieck brings to PBI-Gordon many years of knowledge in the industry, including experience in herbicides, insecticides and fungicides.

"Brett's the kind of exceptional leader who has an impact on the entire sales group," says Doug Obermann, PBI-Gordon vice president of professional and agricultural sales. "With his insight and experience leading an already excellent team, I know we'll see great things from our eastern region."





In honor of the re-opening of Los Robles Greens, Superintendent Ron Kerley (center), is presented with a gift by Jim Olivier, COO, Arcis Golf, and Mayor Joel Price, city of Thousand Oaks.

## //WATER SAVINGS

# Less water for Los Robles

➔ Los Robles Greens, owned by the city of Thousand Oaks, Calif., and managed by Arcis Golf, was recently re-opened as an environmentally and economically sustainable facility.

The renovation included the removal of more than 30 acres of golf course turfgrass, as well as a redesign of the irrigation system for greater efficiency. After the newly landscaped areas grow in, Los Robles Greens is projected to use 20 to 25 percent less water annually. The reduction in turf also means less fertilizer, pesticides and fossil fuels will be needed to maintain the course.

Along with lessening the environmental impact, the course redesign by Arcis Golf and Fry/Straka Global Golf Course Design enhanced the "spirit" of the course by widening the fairways, removing water features and implementing a naturalistic style of bunkering that blends into the new setting. Additionally, nearly 40 acres were converted into native areas, with the installation of more than 50,000 native California drought-resistant plants. During the renovation, new plantings were mulched with product made on site by recycling more than 10 years' worth of green waste that had accumulated on property.

THEY SAID IT

### KYLE JOHNSON

SUPERINTENDENT, INVERNESS CC, BIRMINGHAM, ALA.  
On the pressures of the superintendent profession.

**"There are only two kind of superintendent jobs: high pressure and mid-pressure. They all have pressure."**

See *"Five years later,"* page 26

## // I WANT MY GOLFDOM TV

### JEEHAE LEE TALKS TURF

With Topgolf in the spotlight this issue, we asked Topgolf Director of Business Strategy Jeehae Lee what she thinks will strike new players about an actual golf course; how her company is encouraging people to take up the game; and why superintendents have taken an interest in Topgolf's progress. To see the video, click over to [golfdom.com/category/video/](http://golfdom.com/category/video/).



EMAILS @ TEXTS # TWEETS

Great reads in this month's @Golfdom on the late, great Arnold Palmer. Well done and fascinating stories.

**Andrew Jorgensen**  
*@LowBudgetSupt*



## // GOLFDOM WISDOM

You think the drought in your area is bad, it could be worse... the World Series champion will end a 67 year or 108 year drought. #golfdomwisdom



"It's fun to go undercover to get the scoop about what golfers are thinking. In the case of superintendents, espionage can be enlightening. It gives you the chance to learn what the average golfer knows or thinks about golf course maintenance."

**STEVEN WRIGHT, CGCS**, *Pine Tree GC, Boynton Beach, Fla.*

## Undercover super

**T**he idea came to me one day last year in advance of the city championship. I always play a couple practice rounds ahead of the event. I can call up and play by myself or ask to get put with a group. I prefer the latter.

It's fun to go undercover to get the scoop about what golfers are thinking. In the case of superintendents, espionage can be enlightening. It gives you the chance to learn what the average golfer knows or thinks about golf course maintenance. Pulling it off takes a little acting skill; very little if you have kids, or as my wife always says, "you're good at B.S."

Obviously, no one can know you in the group you get paired with, but you don't need to lie, just embellish a bit. In my case, I was in landscaping. Oh, and don't worry, whatever you go with will be forgotten rather quickly on the course. (Important side note — do not attempt this if you work at a private club. They already know you. #justsaying.)

Off to the 1st tee with three guys who seemed to be buddies, 10 to 15 handicaps. Mark was a painter, Henry was in construction and Robert sold cars. The first few holes settled everyone in. I might add that the "muni" was in good shape despite all the rounds.

On the 5th hole the greens all of a sudden got too slow for Robert, even though he had one-putted three out of four. Too much grain was to blame. (I wonder where he got that from?) For the next few holes, grain was the central topic. I did my best to explain grain and growth characteristics on putting greens, from a "landscaper's" perspective. One of the guys seemed to understand. At least he started inspecting the edges of the

hole looking for the worn-out side. Not long after that a putt rolled away from the hole right at the last second, the dreaded "volcano effect." Gets them every time. If I had a nickel...

These guys had decent games until they wound up in a bunker. Lots of shots lost there. They all agreed the bunkers were inconsistent. I pointed out that the bunkers were raked that morning, but by the time we got there, too many footprints or half-assed attempts to rake them were adding to the inconsistency. So Henry raked a spot smooth and played a good shot from it. Go figure.

With a little wait on the 16 tee, green speed came up again. Robert had missed a short one on 15 and made a

comment. I said the greens were cut at 7 a.m. that morning and had grown some since.

How did I know? I blew my cover, so I came clean.

They were extremely cool about it, and afterward we talked a lot about maintenance. They were interested and asked some good questions. They said that they only get bits and pieces about maintenance and appreciated the information. I think it made a difference. I'm not sure if I would have seen the same results if they knew right from the first tee that I'm a superintendent.

I've played golf with members throughout my career and I've heard similar comments. I take notes and ask direct questions. I'm expected to have the answers or solve the problem.

Our profession as a whole has worked hard to educate golfers about golf course maintenance practices. National, state, regional and local chapters of GCSAA, USGA, PGA and others have all contributed. It's a never-ending job.

More new golfers might mean we have to repeat ourselves again and again, at least we hope so. There is still work to be done. Try going undercover at your course, have fun with it. Any way we can reach our golfers, whom-ever they are, is good.

**Steven Wright, CGCS**, is golf course superintendent at Pine Tree GC in Boynton Beach, Fla. He can be reached at [steven\\_wrightcgcs@pinetreegolfclub.net](mailto:steven_wrightcgcs@pinetreegolfclub.net) or followed at [@wrightsteve19](https://www.instagram.com/wrightsteve19).



# A Simple Solution to a Complex Issue



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Polylast Systems Patent No.: US 8,389,624 B2 issued March 5, 2013. \*Patent Pending

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# Golfdom Gallery



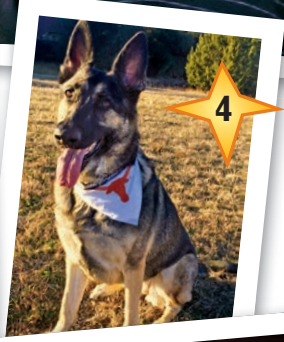
**1 Dan the man** When *Golfdom* Western Regional Sales Manager Jake Goodman isn't selling ads, he's hanging with NFL Hall of Famer Dan Marino. Goody, when do we get to see an Isotoner ad in the magazine?



**2 An inconvenient truth** Interesting that every time Ed Easley (right), Arcis Golf vice president of construction, stopped to play in his group, *Golfdom* EIC Seth Jones complained he had a bad hole at Los Robles Greens GC, Thousand Oaks, Calif... Yet Jason Straka, ASGCA, (left) Fry/Straka Global Golf Course Design, has played 36 holes with Jones and never seen him play a good hole.



**3 Riding off into the sunset** (L to R) Los Robles Greens GC Superintendent Ron Kerley and Project Landscape Architect Brian Broderson celebrate the end of a successful day: the grand re-opening of a water friendlier Los Robles.



**4 Hook 'em Horns** Even though Tyler Andersen, superintendent at the University of Texas Golf Club in Austin, went to the University of Florida, his German Shepherd Layla still wears the course's colors.



**5 Team Trinity Forest** It was great to meet the team at Dallas' Trinity Forest, where Kasey Kauff is the superintendent. Left to right is Sarah Jackson, Adam Deiwert, James Morgan, Kauff, Chad Kuzawa and Grant Harrison. Sorry we missed you Seth Smith, great name, though.



**6 Topgolf Las Vegas** A lot of research went into this month's cover story, including a game at Topgolf Las Vegas with (L to R) Shadow Creek GC Assistant Superintendent Luke Maddox, Adrianne Jones, Seth Jones, Andrea Cloninger and Shadow Creek Superintendent Tim Cloninger.

PHOTOS BY: JAKE GOODMAN (1), SETH JONES (3, 5); TYLER ANDERSEN (4)





“I’ve always been a movie fan... What if filmmakers adopted more golf-centric themes into their movies? Let’s take a look at some examples of what could have been.”

**JOEL JACKSON**, *Senior Contributing Editor*

## See you at the movies

**T**here is so much negativity in the news these days that I would like to offer up a rewrite of a column I did back in 2008 for a regional publication called *Florida Golf Central*. This publication has grown to become *Southern Golf Central*. Owner/publisher Terrie Purdum also is the driving force behind the “Turf Life” movement, which supports all aspects of sports and games played on turfgrass.

I’ve always been a movie fan. I remember as a kid walking or taking a bus to downtown Tampa on Saturday mornings to see cartoons, Flash Gordon serials and the main feature, usually some sort of action/adventure like a western or swashbuckler picture. Now I live at the epicenter of the movie-making industry. And now, on with the show! I mean column.

Hi! My name is Joel and I’m a golf addict. People who love golf know that the game isn’t a matter of life and death. The truth is, it’s more important than that. If we couldn’t get our weekly fix of chips and chili-dips, we’d go nuts. No one knows better than me how pervasive golf can be in our golf-centric lives.

What if filmmakers adopted more golf-centric

themes into their movies?

Let’s take a look at some examples of what could have been.

### **Sleepless in Seattle:**

Superintendent vents fears and anxieties about hosting an upcoming member-guest tournament on a national radio call-in show. A reporter does a follow-up story about SSS (superintendent stress syndrome). They fall in love and start a national superintendent support group with offices in the Empire State Building.

**The Sixth Sense:** Supernatural tale about a turf student who sees dead grass. He ends up working for a veteran superintendent played by Bruce Willis. Using the kid’s special gifts, Willis corrects turf problems before they happen. Nevertheless, Willis’ career is dead. The club wants

to “take it to the next level.”

**Titanic:** The name of a new fungicide developed by Gen-X scientists combats snow mold on bentgrass, but it turns out it does not protect against ice damage. Can the young lab rats prevail against the corporate heads who want to market the flawed product?

**As Good As It Gets:** OCD personality can’t sabotage this superintendent. Special event goes off without a hitch. Weather cooperates. Crew goes above and beyond. Members publicly praise the superintendent at the reception. This is a fantasy sure to delight all superintendents.

**When Harry Met Sally:** Romantic comedy about two superintendents who meet and fall in love at a Golf Industry Show. When fuel prices get so high that long-distance dating is impossible, the couple

must decide where the grass is greener. The funniest bit is when Harry and Sally are in a LESCO truck and she reads the label on a bag of organic fertilizer...

**2001 Turf Odyssey:** “Hal,” the irrigation computer, shuts down the entire system when the superintendent tries to override the ET rate setting. While the turf dies, Hal illogically maintains the prime directive from the local water management district. The superintendent and crew save the day by hand-watering daily until the rainy season begins.

**Iron Man:** The story of a former golf course superintendent turned equipment salesman. Our hero must adjust from the caterpillar-eat-grass world of turf management to the dog-eat-dog world of sales quotas, endless traveling and sponsoring local chapter events.

**The Dirty Dozen:** Twelve pin placements during a major tournament that shocked the golf world. Hidden cameras in this docudrama reveal the sadistic elation of committee members as touring pros 3- and 4-putt greens. The superintendent is forced to go into the witness protection program.

*Got a great movie that needs to be adapted to the world of superintendents? Tweet it to us @Golfdom and use the hashtag #SuperMovies.*

Joel Jackson, CGCS-Ret., is senior contributing editor for *Golfdom*. Email him at [flrjn@aol.com](mailto:flrjn@aol.com).

# The Golfdom



FROM THE ARCHIVE

Some people are just ahead of their time, and H.S. Campbell, the author of this article from the March 1928 edition of *Golfdom*, certainly was ahead in the golf industry. Campbell was hoping for a product that could tell him the acidity or alkalinity of the soil on his green. The technology wouldn't be available for years. Superintendents today have their choice of multiple products that can gauge soil salinity, moisture levels and temperature, while incorporating GPS and Wi-Fi technology. We don't think even Campbell could've predicted all that. To read the full article, visit [golfdom.com/exclusive](http://golfdom.com/exclusive).

## What a soil-tester will tell the greenkeeper

BY H.S. CAMPBELL

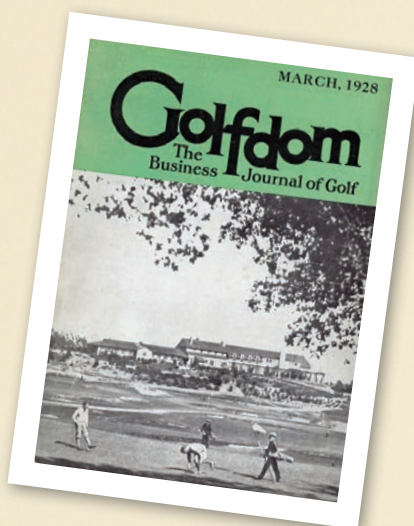
Would it be carrying this scientific "greenskeeping" business too far by making the following suggestion — that a record of the acidity or alkalinity of each green be kept through the playing season? A soil test made every week and posted on a chart should be very useful.

We have been told that greens thrive in an acid soil. But how acid? Does anyone know? A soil test of a fine green should answer that question.

One course will have beautiful, healthy greens while a neighboring course has poor, spotty and apparently ill-nourished greens, notwithstanding the fact that the care and treatment are practically identical on both courses. The following year, conditions may be reversed.

And when the misfortune of brown patch hits one or more greens, would not the exact knowledge of the acid or alkaline content of the soil of the diseased greens be beneficial? Compared with the soil of the unaffected greens, would this not help in avoiding this disease?

We are told that many factors must be considered in placing responsibility for brown patch. Amount and kind of water



and time of day applied, drainage, air circulation, weather and other factors are blamed. Yet you will find greens placed in groves of trees, poorly drained and indifferently cared for, which are absolutely free of brown patch, while on an adjacent well-kept course, brown patch will be found on a well-drained green out in the open with no trees and plenty of air circulation.

As Alice said, it is all very confusing.

In the business world, charts and records of the past are recognized for their full value and are of inestimable help

in planning for the future. And if golf course maintenance is not a business, what is it? Consider the money invested.

Making soil tests and posting results each week would be just one more job for harried greenkeepers, many of whom are expected to produce \$20,000 results on an \$8,000 or \$10,000 budget. But I'll bet a cookie that every one of them would keep this record if they were convinced it would help them keep their greens in better condition.

Many greenkeepers make a daily visual inspection of each green at an early hour. One day every week he can take with him one of the pocket soil-testers and make an absolutely reliable reading of each green in from two to five minutes. Eighteen times 5 minutes are 90 minutes, plus 10 minutes spent back at the barn or office in posting the chart, makes a time expenditure of one hour and 40 minutes per week.

The value of such a record would depend upon the individual keeping it, the regularity of the tests and the ability of the greenkeeper to draw conclusions from recorded facts.

One of the soil testing outfits that is being extensively used by some well-known greenkeepers is one that is profitably employed in water testing. Tests made of the city water used at the Beverly Country Club, Chicago, show an alkaline reaction of 8.0 on the "pH" scale. This necessitates use of a large amount of sulphate of ammonia or other nitrogen fertilizer to overcome the effect of the alkali in the water.

There is no set figure on the proper acidity figure. Observation of the figure on various greens that are in excellent condition determines an average that affords a safe working basis for the greenkeeper.





“... I felt the need to play ‘dad’ and inform the six attendees around me, ‘Alright, we have Bob Farren at our table. Everyone be on their best behavior tonight.’”

**GRANT B. GANNON**, *Associate Editor*

## Working the room at Green Start Academy

**A**s the equivalent of the assistant superintendent here on the *Golfdom* staff, it just makes sense that I travel to the annual Green Start Academy (GSA) in Raleigh, N.C. each year. I recently made my second trip — to the 11th annual event — for three days of education, networking and fun.

GSA is an event hosted by John Deere and Bayer for 50 assistant superintendents across the U.S. and Canada to network with peers and learn from high-profile superintendents about topics like tips for a successful interview, how to get the most out of people and budgeting.

The event begins with a formal dinner. After the group was herded into the dining room I sat down at an empty table. Soon after I heard a familiar voice ask if the seat to my left was available. It was Bob Farren, director of grounds, Pinehurst (N.C.) Resort.

Near the beginning of the meal, Farren briefly stepped away from the table and I felt the need to play “dad” and inform the six attendees around me, “Alright, we have Bob

Farren at our table. Everyone be on their best behavior tonight.”

I have met Farren multiple times but I was still impressed when he said that he remembered me. It was a pleasure talking with him, and he definitely lived up to the nickname given to him in these pages, Turf’s Most Interesting Man.

He told us stories about his days as a freshman at Marshall University watching the football team with seniors who were the first recruiting class after the tragic plane crash, and about the time he was watching a Los Angeles Dodgers game with his wife when she excitedly recognized a regular customer of the TCBY frozen yogurt franchise they owned. The patron? Baseball Hall of Famer Sandy Koufax.

I love events like GSA because of the people I get to catch up with, like Farren, and the new people I meet, like assistant superintendent attendee Joshua Krug.

Krug is the second assistant superintendent at TPC Scottsdale (Ariz.), but his path to that position was atypical. The Detroit-area native attended Western Michigan University and received a dual degree in Recreation and Environmental and Sustainability Studies. After graduating in 2015 he wasn’t exactly sure what he wanted to do, and applied for turf management positions in parks and recreation and at cemeteries. He got a call back about a job at Arlington (Va.) National Cemetery. “There may not be a ton of money in the cemetery industry, but it makes up for it

in job security,” said Krug.

His only golf course experience was working on a par-3 municipal course, but he decided to apply for crew positions at golf courses around the country. He got an offer to work at TPC Scottsdale as an Equipment Operator 3 (EO3).

Krug quickly learned the intricacies of the job and was constantly pestering then-superintendent Jeff Plotts for more responsibility. Eventually Plotts ran out of jobs, but Krug kept grinding and took the initiative to get his spray technician certification and an irrigation certification.

Thanks to his efforts and some job movement in the TPC network, within six months Krug was promoted to EO4, to assistant-in-training and finally to his current position at TPC Scottsdale, which he has held for a year.

I’m sure superintendents wish a Joshua Krug would apply at every golf course across the country, but I realize that’s not likely to happen. I bring his journey up for two reasons; Millennials have a negative connotation in society right now. I hope Krug’s story will give superintendents hope for my generation. Plus, I want to applaud Plotts for hiring a recent college graduate from thousands of miles away without a traditional turf degree and with minimal golf course maintenance experience. Because he took that chance, Plotts gained a solid employee and Krug started a career with a bright future.

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# GAME ON!

On Jeehae Lee's watch, Topgolf's group lesson program has grown by 600 percent, with many of those participants new to golf.



It's 9 a.m. on a Wednesday, and already the music can be heard from the parking lot. Right now, it's Alt-J's "Left Hand" pumping through the speakers.

*"With your left hand free,  
And your right in grip..."*

Topgolf Allen, located 25 miles north of Dallas, opened for business in 2011. It offers 94 climate-controlled hitting bays, 225 HDTVs, a beer garden, a lounge with free pool, shuffleboard and Xbox and a menu item called "injectable donut holes" that come with a plastic syringe to squirt various jelly fillings right into the middle of a delicious warm donut.

"Instead of having to go to a golf facility — which is an intimidating environment for anyone — we're allowing them to experience golf like this," says Jeehae Lee, gesturing toward the hitting bays but also the bar area, the high-top tables, the horseshoe booths and the many HDTVs. Lee, a former LPGA player and now the director of business strategy for Topgolf, continues, "Here, they can enjoy food and beverage in a social environment... but also experience golf for the first time."

*Continued on page 18*

BY SETH JONES



## TOPGOLF

is successfully exposing millions of non-golfers to the game. Is this high-tech experience the key to rejuvenating an aging game?

PHOTO BY: MATT HAWTHORNE



An estimated 12 million people will swing a golf club in Topgolf facilities across the U.S. this year.

*Continued from page 17*

Golfers on three different platforms smack microchipped golf balls repeatedly at targets embedded in the ground. A TV screen gives instant stats — where the ball landed, how far it traveled, how many points that golf ball earned them and what their next shot is worth. In 2015, 13.2 million microchipped golf balls were hit at this location alone. Topgolf Allen enjoyed 231,000 player visits that year.

Now it's "Epic" that's booming over the speakers, Faith No More's hit from 1989.

*"Can you feel it, see it, hear it today?"*

*If you can't then it doesn't matter anyway.*

*You will never understand it 'cause it happens too fast..."*

From a feather-stuffed golf ball along the Scottish coastline to a microchipped golf ball in suburbia — could the forefathers of the game ever have imagined a golf game such as this?

### **Committed to growing the game**

Lee has been with Topgolf for 16 months. Her background is as impressive as her high-heeled swing: A Bachelor of Arts in economics from Yale (where she was on

the golf team), followed by five years playing on the LPGA Tour. After retiring from competitive golf, she went to work for



**Jeehae Lee**

powerhouse sports agency IMG, managing Michelle Wie's media opportunities, sponsorships and scheduling. She then returned to school at the University of Pennsylvania's Wharton School for an MBA in business, management and marketing.

Lee realizes she's in a unique situation, she says, not just to grow Topgolf's business, but to perhaps grow the game of golf. Of particular interest to her are the same demographics that golf seems to be missing out on — women, minorities and Millennials.

"I am a woman, I am a Millennial, I am a minority. I think by that quality alone I have a very authentic voice in growing the game — like I represent something very unique," she says. "I do take the responsibility of growing the game of golf very seriously. We are committed to growing

the game of golf on all fronts."

Topgolf is promoting the game in more ways than just by exposing it to a vast number of people (8 million in 2015, more than half of them new to golf). Lee is most excited about the low-key, affordable golf lessons called TopgolfU. These laid-back group lessons start at \$29 an hour and can make the rookies feel confident enough to take their game to the golf course, she says.

Launched in April, TopgolfU increased Topgolf's lessons 600 percent between May of 2015 and May of 2016. Lee projects TopgolfU will be teaching 60,000 students annually, and 65 to 70 percent of those students will be women. Of the women, 90 percent of them will consider themselves new to the game.

"We're capturing those who aren't just avid golfers who would pay \$100 for a lesson, but those who are intrigued by golf but wouldn't commit to it from the get-go," she says. "Women and Millennials are two demographics we really need to focus on to improve the health of the game. We're really proud that we're accomplishing that with TopgolfU."

*Continued on page 20*



# 13

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Celebrities such as LeBron James, Drake and Blake Shelton have been spotted playing at Topgolf Las Vegas, giving the game instant credibility among young people.



*Continued from page 18*

### **Bullish on Topgolf**

At the World Golf Foundation, CEO Steve Mona has been keeping a close eye on Topgolf's progress for the last four years. He not only has visited Topgolf headquarters in Dallas on multiple occasions, he also commissioned the National Golf Foundation to study Topgolf — as well as other

alternative forms of the game — to see if they could have an impact on golf.

The alternative games studied were footgolf, simulator golf and video game golf. Upon completion of the study, the NGF deemed Topgolf as the alternative game most likely to help the traditional game.

"We are bullish that we can get Topgolfers to transition to the golf course," Mona

says. Why? In typical Steve Mona fashion, he gives three reasons: Its relaxed attitude, its ease and its catering to Millennials, all of which will encourage people to further explore the game.

"I went to the Overland Park (Kan.) Topgolf at noon on a Saturday, and I was the oldest person in the building," Mona says. "The average age there was probably 30. Trust me, I don't go many places where I'm the oldest person, but that was one. It's pure fun. No matter where you hit the ball, there's a chance of scoring points, a chance of success. A lot of people who try golf don't progress, and that's why they drop out."

Mona has kept in regular contact with Topgolf executives to see how the company can support such Golf 20/20 initiatives as Get Golf Ready, The First Tee, Drive, Chip and Putt and PGA Junior Golf League.

Though no formal partnership is in place, Mona believes that Topgolf, as a



**Steve Mona**





company, is eager to help grow the game.

“I really believe that Topgolf feels an obligation to the future of the game,” Mona says. “They’re invested. Golf means something to them. Every one of our initiatives, they feel like they can drive people to it, to the game.”

### Relaxing the rules

Another group appreciative of Topgolf but with no official relationship is the National Golf Course Owners Association. NGCOA CEO Jay Karen loves the fact that Topgolf is giving millions of people the opportunity to experience what NGF CEO Joe Beditz describes as “shot euphoria” for the first time.

“The industry guy in me says that anything that puts a golf club in someone’s hand swinging at a golf ball, I am in favor of. I haven’t seen a single cognizant argument as to why (Topgolf) couldn’t be good for golf,” Karen says. “The debate is, can it be good not just for the golf industry, but for the golf *course* industry. How do we bridge the two?”



Jay Karen

Karen says the bridge between the two currently is organic with an opportunity to be more systematic. In the meantime, he says Topgolf is teaching traditional golf a lesson on how to appeal to Millennials.

“(Topgolf’s) success is the market telling us that a golf experience can be a hell of a lot of fun,” Karen says. “I think more

*Continued on page 22*

From little kids in high tops to adults in jean shorts, Topgolf welcomes all shapes and sizes of customer. Even better if they like to Tweet while playing.



PHOTO BY: MATT HAWTHORNE



### Zero Competition

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*Continued from page 21*

golf courses are going to experiment with 'wine and dine' events, music on golf carts, all the things to 'loosen up' the experience so somewhere in the middle lay a sustainable future for golf."

Karen stresses that 'loosening' the golf experience isn't something that needs to happen across golf universally. He does think that the relaxation of some rules, like dress codes and cell phones, appeals to a wider market.

"I think if you don't change, your market is going to shrink. There's still going to be millions of people willing to play golf on the traditional model, but that model is shrinking, so you're going to have to fight harder for that market," Karen says. "For example, cell phones. There's no way Topgolf is going to limit cell phone usage. They encourage it! Take pictures, share them, go

nuts. But there are golf courses out there that frown on even having a cell phone on the property.

"We can steal a page from that playbook and many facilities have," Karen continues. "The casual approach certainly is in line with the Millennial sensibility more than the traditional golf experience."

**Topgolf Los Angeles**

The Lakes at El Segundo, located across the street from Los Angeles International Airport (LAX), isn't just adopting the relaxed atmosphere of Topgolf. It's adding Topgolf itself.

The municipal course, owned by the city of El Segundo, is building California's second Topgolf facility over its driving range, parking lot and a few golf holes. The clubhouse will be demolished and rebuilt in a new location to accommodate Topgolf.

Fry/Straka Global Golf Course Design has been tasked with redesigning the property so that Topgolf and traditional golf not only coexist, but co-succeed. Jason Straka, ASGCA, says that the transition from Topgolfer to traditional golfer could happen almost by accident at the Lakes of El Segundo.



**Jason Straka**

"People will go for Topgolf only, without understanding there is a 9-hole executive course and full learning academy (on-site)," Straka says. "They're going to have a golf green that's lit-up at night. You're pulling these people in. It's almost a graduation — from not thinking you're going to do anything but play Topgolf, to the next thing you

IMAGE COURTESY OF FRY/STRAKA GLOBAL GOLF COURSE DESIGN

**SCORE CARDS**

EXISTING		EXISTING	PROPOSED		PROPOSED
Hole	Par	Black	Hole	Par	Black
1	3	128	1	3	112
2	3	112	2	3	123
3	3	178	3	3	92
4	4	269	4	4	269
5	3	96	5	3	110
6	3	78	6	3	78
7	3	103	7	3	103
8	3	115	8	3	124
9	4	261	9	3	192
<b>Out</b>	<b>29</b>	<b>1,340</b>	<b>Out</b>	<b>28</b>	<b>1,203</b>

This rendering of the Lakes at El Segundo, next door to LAX, shows how the course will look after the addition of California's newest Topgolf facility.





know you're on the Lakes of El Segundo.”

Straka believes in Topgolf's potential to create new golfers — even when not at the same location — because he's seen it himself. While in Tampa, Fla., Straka took his family to play Topgolf for the first time. His 10-year-old daughter Kate, the only non-golfer in the family, had the best time. A few months later, back at home, she went golfing with a friend.

“Until that visit (to Topgolf) there was no chance — and I mean no chance — that that girl was going to get out on any type of golf course,” Straka says. “Whether she sticks with it, who knows? But with that one instance, we finally cracked the door.”

### An amazing game

Call it an occupational hazard — Lee knows the Topgolf menu backward and forward.

*Continued on page 24*



“I like it when one of my girlfriends sends me a Snapchat or a text from the golf course the weekend after we (Topgolfed,)” Lee says. “That’s my favorite part of working at Topgolf.”



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## // READY PLAYER ONE

Continued from page 23

She likes to go backward when ordering — dessert first. So the injectable donut holes go from dessert to appetizer. How's that for Millennial instant gratification?

Lee brings her friends to Topgolf on weekends. On more than one occasion, she's received Snapchat photos of those same friends on the golf course the next weekend giving traditional golf a try. She says the feeling she gets when she helps introduce a new player to the game is the most rewarding part of her job. (Sorry, donut appetizers.)

"Golf is an amazing game. It's booming in Asia in ways we never thought possible," she says. "If you look at the future of the game — Rickie Fowler, Jordan Spieth, Lydia Ko — they transcend golf and are relatable to Millennials. Because of that, golf has great things ahead of it." 🇺🇸



Despite her LPGA experience, when Lee brings beginner friends to Topgolf, her advice is simple: "Pretend it's a baseball and try to hit it."

PHOTO BY: MATT HAWTHORNE

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(L to R) Tyler Andersen, Kasey Kauff and Kyle Johnson pictured during the 2011 PGA Championship.



After successfully hosting the 2011 PGA Championship together at Atlanta Athletic Club, three young superintendents set out on their own.



Semi-retired, Ken Mangum, CGCS (right, with Andersen and Kauff before the 2011 PGA Championship) visits his students regularly. "I'm very proud of those guys, the PGA Championship (crew) was a special group," he says.





Kauff, Andersen and Johnson had an excuse to get together when they were invited to the 2015 Golfdom Summit and got to meet Ms. 59, Annika Sorenstam.

# Five years later

BY SETH JONES

**G**uys stuck in assistant superintendent positions for years; young turf grads leaving the industry for other professions; new labor laws that impact overtime and the way courses get the work done. How about a positive story?

It was five years ago that Atlanta Athletic Club, under the direction of Ken Mangum, CGCS, hosted the 2011 PGA Championship. The tournament, won by Keegan Bradley, was an agronomic success for a course showing off its new greens surfaces of Champion bermudagrass.

Three young turf professionals led the charge for Mangum, put in power positions at the ages of 31, 25 and 25. Five years later, Ken's kid's are grown up and successful superintendents at courses of their own. Kasey Kauff, 36, is superintendent at Trinity Forest Golf Club in Dallas; Tyler Andersen, 30, is superintendent at the University of Texas Golf Club in Austin; and Kyle Johnson, 30, is superintendent at Inverness Country Club in Birmingham, Ala.

"I'm very proud of those guys," says Mangum, now retired from Atlanta Athletic Club but still a consultant. "The PGA Championship (crew) was a special group. We had fun, worked hard and had success."

## Experience is everything

Kyle Johnson was named superintendent of Inverness in May 2014. He loves his life in Birmingham, he says. He's closer to family and his own family is growing. He and his wife, Anna, welcomed Chandler Grace on May 31.

*Continued on page 28*



## // WHERE ARE THEY NOW?

Johnson says Inverness CC, Birmingham, Ala., was a good fit for him. "They have a nice budget and great resources," he says. "I knew I could succeed here and build a great product"

*Continued from page 27*

"The baby is awesome, brother," Johnson says with a smile. "She slept through the night the first night we brought her home from the hospital. She's always happy and always smiling."

Johnson, who also always seems to be smiling, says it meant "everything" to his career to work at AAC on Mangum's watch.



**Kyle Johnson**

Kauff uses almost the exact language — "Pretty much everything" — when asked what his time at AAC meant to his career.

"I think had I not had that experience, I don't think I would have ever moved up in the industry, especially the way it is now," he says. "Members look at that championship. You're sending out your résumé blindly; a board member says, 'This guy deals with championship conditions all the time.' That gets you an interview over someone who might be at a nice private club but doesn't host a championship."

Trinity Forest, a Coore/Crenshaw design, celebrated its grand opening last month. Kauff has been at the course for two years, "since the first piece of dirt hit the ground" at what previously was a landfill, now shaped into a links-style golf course by bringing in 750,000 cubic yards of dirt.

The course will host the AT&T Byron Nelson beginning in 2018. Trinity Forest is uniquely geared to Kauff's skill set, as its zoysia fairways and Champion bermudagrass greens are similar to AAC.

"(Mangum) is this godfather of superintendents in the South," Kauff says. "(Trinity Forest's owners) called Ken and he said, 'I



**Kasey Kauff**

know one person with that unique skill set (of working with those particular grasses.)' That has everything to do with where I am now."

Andersen is a second-generation superintendent. He mostly interned for his father, John, until it was time to get "a serious internship" before his senior year at the University of Florida. He knew that Mangum was the only superintendent he wanted to learn from, apart from his father.

"Watching him work a greens committee, or the way he worked the floor of the halfway house, or his staff meetings — that was my 'this is it,' moment," Andersen recalls. "I dug in and learned everything I could."

Andersen was the last of the three amigos to depart Atlanta, becoming superintendent of the University of Texas GC in May last year.

"I put in eight years with Ken. When it was time to leave you have a moment where you know it," Andersen says. "I was his last superintendent there when he retired, so I got to see multiple course renovations, multiple major championships. I was fortunate to be his last protégé."



**Tyler Andersen**

### Best friends

The three friends grew used to seeing each other every day. Even their girlfriends — now wives — became friends. "When Kyle told us Anna was pregnant, it was a big deal to all of us," Kauff says.

Though the three now are spread out across two states, they still take time to stay in touch. Aside from regular phone calls ("I was talking to Kyle when you called," Kauff said during his interview), the three bounce around a daily group text message that rarely is about turf.

"The three of us just clicked together," Andersen says. "We were all there for the same reason. We were there to work hard, learn as much as we could and then go out and get our own great golf courses. It was definitely something special we had, the three



of us, and our personalities.”

Johnson says he talks to Kauff at least twice a week, and to Andersen once a week.

“Kasey, Tyler and I clicked as a team, and we’ve been best friends ever since,” Johnson says.

### All-access view

Mangum estimates that he mentored close to 100 people who went on to be superintendents during his 38 years as a superintendent.

“I always took hiring very seriously,” he says. “You have a young man sitting in front of you trying to make a name for himself, trying to be successful. And you have to pick one out of 30 or 40 to get a chance that others don’t get. You have to sit there and look at someone and ask yourself, ‘In five years, is this guy going to be a star?’”

Getting a hire right and watching that person go on to have success was one of the most rewarding parts of his job, he says. He still keeps in contact with Andersen, Johnson and Kauff, visiting their three courses regularly.

“They’re all different, but they all had drive and they have outgoing personalities,” Mangum says of the three. “People today all have good agronomic backgrounds. You have to have people skills

*Continued on page 30*



Mangum has visited Andersen at University of Texas GC four times since he took the job. “It’s fun, in a way we still work together,” Andersen says.

UTGC overlooks Lake Austin and borders the Balcones Natural Wildlife Preserve. No. 14, pictured, is named after former Longhorn Justin Leonard.



PHOTOS BY: TYLER ANDERSEN



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## // WHERE ARE THEY NOW?



Continued from page 29

and know how to treat people below you and above you.”

Kauff recalls the all-access view Mangum gave them during their Atlanta Athletic Club days. From committee meetings to nasty emails, Mangum didn't shield them from anything.

“A complaining email is an important thing to learn; a lot of guys aren't used to that,” Kauff says. “They get to their own course and they think an email like that is life or death.”

“So many assistants get hung up on the operations and the agronomic standpoint and they don't learn how to talk to members,” Andersen says. “They don't learn how to put a professional act together or speak in front of people. That's so critical because when you are talking in front of multi-millionaires or billionaires or highly respected people in the community, you have to be able to pull that off, and some people just can't.”



Trinity Forest, a Coore/Crenshaw design, will host the AT&T Byron Nelson beginning in 2018.

### Secrets to success

So that's the secret to success, then? Go work for Ken Mangum and watch the job offers and money pile up?

Not quite. All three have different keys to success that they pass on to their young(er) employees.

Kauff tells his crew at Trinity Forest that they need to consider what kind of course they're going to work at after they get an AT&T or two under their belts.

“If you want to be at a top-end club as a superintendent, their next move needs to be another high-end, tournament-style golf club,” Kauff says. “It's not for everybody, and that's fine. But I think employers want to see that tournament golf course on your résumé, otherwise they get passed up.”

Andersen suggests that students explore different climates through internships, then choose the climate in which they want to work. “Pick the area where you know you can succeed the most, where you enjoy growing grass.”

Johnson, who is a member of the Alabama GCSA Board of Directors, regularly advises turf students at Auburn that they need to do their homework on potential superintendent employers before taking an internship or an assistant's position.

“Don't just take a job because it's offering \$55,000 as an assistant over one down the road that offers \$40,000,” Johnson says. “The one paying \$55,000 might be for a superintendent who just hands you a piece of paper and says, ‘Go do this,’ but never explains why. The one paying \$40,000 might be the better superintendent who is willing to develop you.”

Andersen seconds that thought.

“The next thing I would say after finding the right climate is seeking out the most tenured, smartest, reputable superintendent who has pumped assistants out to be superintendents in that region,” Andersen says. “Find that guy who has mentored 10, 15, 20 guys and is willing to teach you and be patient with you through the entire process.”

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# Super Science

## // CURIOUS CONNECTION

### THE SUN/NITROGEN CONNECTION

By Bill Kreuser, Ph.D.

Plants need nitrogen (N) and sunlight to be healthy. Nitrogen allows leaves packed with chlorophyll to absorb the sun's energy and ultimately turn CO<sub>2</sub> into sugar. Nitrogen also stimulates growth and quality of light impacts turf health. The impact of N and sunlight on turf health is obvious, but there is another sun/nitrogen connection affecting turf health that is not always considered.

Turfgrass roots primarily take up nitrate (NO<sub>3</sub><sup>-</sup>) because it is more commonly available in the soil compared with ammonium (NH<sub>4</sub><sup>+</sup>). Even ammonium-based fertilizers quickly are transformed from NH<sub>4</sub><sup>+</sup> to NO<sub>3</sub><sup>-</sup> by soil microbes. That soluble soil NO<sub>3</sub><sup>-</sup> moves to the turf roots via mass flow, the process of water being drawn toward the roots as the leaves transpire. The NO<sub>3</sub><sup>-</sup> then is taken up by proteins on the turf roots and moved up to the leaves. This is where the sun/nitrogen connection is important. Light energy from the sun is used to reduce or change the NO<sub>3</sub><sup>-</sup> back to NH<sub>4</sub><sup>+</sup> before it can finally be used to make protein.

This is applicable because sunlight drives transpiration and mass flow of N

to the roots and also is required to reduce or transform the NO<sub>3</sub><sup>-</sup> into a form the plant can use for growth. Shade, low clouds and constant rain reduce solar intensity, which can slow turf green up following N fertilization. We saw this at our plots during cloudy and/or rainy weather.

Nitrate fertilizer also can help with too much light. This occurs on dry and sunny days or during stress in cool-season turf. Warm-season turf also can obtain too much light when it is cool and sunny. This results in chilling injury.

During these conditions the plant is absorbing light faster than it can use the energy. Excess energy then escapes and damages the plant through oxidative stress. Many turf products, from fungicides to pigments, are

marketed to reduce oxidative stress. Some of these products can positively affect plant health. Products such as Turf Screen can minimize oxidative stress on our bentgrass greens. This led to improved quality and higher levels of chlorophyll in the leaves (Fig. 1). Fertilizers containing nitrate also can help with this stress because some of the excess sun energy can be used to reduce NO<sub>3</sub><sup>-</sup> to NH<sub>4</sub><sup>+</sup> and finally protein. Nitrogen will help the plants repair damage caused by light stress.

Bill Kreuser, Ph.D., is a turfgrass scientist at the University of Nebraska-Lincoln. You may contact him at [wkreuser2@unl.edu](mailto:wkreuser2@unl.edu) for more information.

## NEWS UPDATES

### SYNGENTA SECURES EPA REGISTRATION FOR CONTEND SNOW MOLD FUNGICIDE

The EPA has granted registration to new Contend fungicide from Syngenta for control of pink and gray snow mold on golf courses.

Contend delivers unique, multi-targeted control for more than 120 days by combining four active ingredients, including Solatenol, a new active ingredient for the turf industry, according to the company. The new fungicide operates in three Fungicide Resistant Action Committee codes for well-rounded control, and is made up of two separately registered products, Contend A and Contend B.

"We expect that the innovative chemistry of Contend will bring snow mold protection for fairways to a new level," says Stephanie Schwenke, turf market manager at Syngenta. "With four (active ingredients), including a new active ingredient to the turf market and three modes of action, Contend will be an important tool for superintendents to use on fairways, while Instrata fungicide will continue to be our lead snow mold control recommendation for greens."

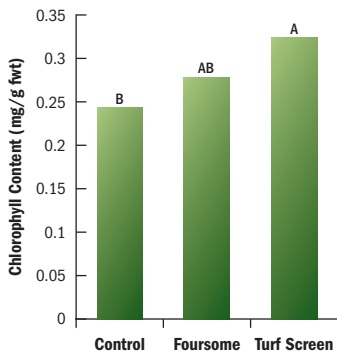
Syngenta says Solatenol, a third generation SDHI developed by the company, binds strongly to the plant's waxy layer and slowly penetrates the plant tissue for long-lasting pathogen defense. This binding, plus translaminar activity, offers quick uptake for superior protection.

## FUNGICIDE APPLICATIONS

CAN BE USEFUL FOR MANAGING FAIRY RING, BUT THERE'S MUCH MORE INVOLVED THAN JUST SQUIRTING THE PRODUCT."

Mike Fidanza, Ph.D.

(see story on page 32)



Turf Screen reduced oxidative stress in turf. This increased leaf chlorophyll content. Nitrogen fertilization also can reduce this stress.

//THOSE FAERIES ARE AT IT AGAIN

# Dr. *basidiomycetes* or: How I learned to stop fairy ring

By Mike Fidanza, Ph.D.

**F**airy ring symptoms observed on greens, tees, fairways and roughs are not caused by magical faeries, but we have to blame someone or something for the destructive nature of this disease complex (Figure 1).

Visual fairy ring symptoms appear in peculiar shapes of circles or rings or semi-circles as either severely wilted and necrotic turf (Type I), dark green and lush growing turf (Type II) or mushrooms or puffballs (Type III) that can literally pop up overnight along the affected outer edges (Figures 2, 3, 4). Those three visual categories or types of fairy ring symptoms occur alone or together (Figure 5). With fairy ring-affected turf sites, the root

zone often becomes hydrophobic or water repellent, which is not good when trying to keep roots alive and functioning during a long, hot summer.

Managing root zone moisture and organic matter has become an important best management practice for maintaining healthy turf and minimizing the occurrence and impact of fairy ring.

Prolonged periods of hot weather and no rain in the summer often trigger the appearance of fairy ring. Circles or arcs of wilted, necrotic and nearly dead turfgrass can appear quickly. A soil surfactant program — initiated in the spring and ideally continued into the summer and fall — is a good way to alleviate the

Continued on page 34

FIGURE 1



Classic example of fairy ring on a putting green.

FIGURE 2



The meadow mushroom, *Agaricus campestris*, often found on fairways and roughs.

FIGURE 3



Close-up of the common meadow mushroom, *Agaricus campestris*, often found on fairways and roughs.

FIGURE 4



Good example of a "puffball" in higher height of cut turf, although this fairy ring species can be a problem in greens and tees, especially those with sand root zones.

PHOTOS BY: MIKE FIDANZA (FIG. 1-3), MELISSA GUGLIOTTI (FIG. 4)



FIGURE 5



Good example of Type I fairy ring symptoms (necrotic, dead turf zone) with Type III symptoms (mushrooms along the outer edge), and Type II symptoms (slightly darker green, stimulated turf along the inner edge).

FIGURE 6



Fairy ring in bermudagrass green with aeration and sand top-dressing to help recovery.

## Fairy ring can be ferocious in Florida

John Cisar, Ph.D., (cisarturfdoc@gmail.com) retired from the University of Florida but now is active in consulting and research, says fairy ring season on Florida golf courses is all year — during the dry season, wet season and in between. Timing preventive fungicide applications can be as mystifying as timing the stock market. It's difficult in south Florida to base applications on the 55-degree to 60-degree soil temperature threshold because soil temperatures rarely get low enough. Fairy ring symptoms often appear after spring aeration, and severe symptoms are often stimulated by those wet/dry (rain/drought) cycles that occur within a season. So what to do?

**KNOW YOUR FAIRY RING SYMPTOMS.** Dark green rings of stimulated turf, or circles of necrotic/dead turf? Mushrooms or puffballs present? When does fairy ring occur? Do you see fungal mycelium in the thatch or in the soil root zone? Have you done an incubation bioassay to determine root zone depth? This will let you know where to target a fungicide. Basically, remove a cup cutter-sized plug, or even several soil probe-sized plugs, place them inside a large plastic bag with a moist paper towel, sit them on a bench top for one or two days and see if any whitish, thick cottony mycelium appears, and specifically where — at the thatch/soil interface or lower in the root zone. This will give you an indication of where to target your product applications.

**KNOW YOUR MANAGEMENT.** Does the turf look “hungry?” Have your soils become hydrophobic? Are you routinely applying surfactants or wetting agents to manage soil moisture uniformity? Do you use those products to retain water or increase permeability of water?

**PLAN YOUR ATTACK.** Whether you are using soil temperature or past history or intuition, apply a preventive product in advance of historical occurrences at your site. With either preventive or curative applications, expand treated areas beyond previous or current fairy ring-affected areas to account for the fungus continuing to grow and spread. One preventive or curative fungicide application probably is not enough to keep the fairy ring fungus in check in Florida, so repeat applications are needed. Also, water in the fungicide after application with at least a quarter inch of irrigation or enough water to “rinse in” the product. Use a soil surfactant either before or with the fungicide application, and water in the surfactant, too. Check the

fungicide label to follow any special instructions with wetting agents/soil surfactants and post-application irrigation.



Reapplying a fungicide at about a 30-day interval (or as instructed on the product label), as well as prudent cultural practices to help recovery, is necessary on seashore paspalum in Florida because it usually takes longer to heal in those dead zones. *Photo by John Cisar.*

**TABLE 1**

Active Ingredient	Trade Name <sup>1</sup>	FRAC code <sup>2</sup>
azoxystrobin	Heritage	11
azoxystrobin + difenconazole	Briskway	11 3
azoxystrobin + propiconazole	Headway	11 3
fluoxastrobin	Fame	11
pyraclostrobin	Insignia	11
pyraclostrobin + boscalid	Honor	11 7
pyraclostrobin + fluxapyroxad	Lexicon	11 7
pyraclostrobin + triticonazole	Pillar	11 3
trifloxystrobin + triadimefon	Tartan	11 3
metconazole	Tourney	3
tebuconazole	Torque	3
triadimefon	Bayleton	3
flutolanil	Prostar	7
fluxapyroxad	Xzemplar	7
penthiopyrad	Velista	7
thiophanate-methyl + flutolanil	SysStar	1 7
polyoxin-D	Affirm	19
hydrogen dioxide	Zerotol	NC
n-alkyl compounds	Consan	NC

<sup>1</sup> Other trade names may be available

<sup>2</sup> Fungicide Resistance Action Committee ([www.frac.info](http://www.frac.info))

Fungicide products currently labeled — or pursuing a label — for fairy ring management in turf. Please read the label carefully for application rates and water-carrier volumes recommended by the manufacturer, application timing, post-application irrigation instructions, tank-mix options with soil surfactants/wetting agents and other detailed instructions. Note, some products listed may not have a federal label but may be used in accordance with manufacturer-issued 2 (ee) recommendations. Also, there are other adjuvant and soil amendment-type products available that provide recommendations for fairy ring-control programs.

Continued from page 32

wet/dry roller coaster and facilitate some consistent, uniform soil moisture.

Fungicide applications can be useful for managing fairy ring, but there's much more involved than just squirting the product. Back in the 1990s, the only fungicide labeled for fairy ring was Prostar (flutolanil, Bayer Environmental Science). Today we have many options (Table 1).

A preventive fungicide program can work — in theory — if we could somehow predict when and where fairy ring will occur. Fairy ring seems to show up on a green or a fairway in one year but not the next, or on a few greens, but not all greens. Even so, some fungicide products have instructions for making preventive applications, and many superintendents have had success with preventive programs while others have had challenges “dialing in” the optimum timing for a preventive program that

works at their location. One preventive application may not be enough to provide season-long control. (See sidebar “Fairy Ring can be ferocious in Florida.”)

We use a curative method in many cases because that's when we actually can see fairy ring symptoms, so we know exactly where to target our control efforts. A good curative approach starts with punching holes and venting the root zone, followed-by a soil surfactant and fungicide applications that's watered in. Then use your agronomic skills to “rescue and recover” the turf (Figure 6).

Fairy ring management requires a multi-faceted approach that uses your knowledge and expertise in plant pathology, soils, agronomy, weather forecasting and persistence.

Mike Fidanza, Ph.D., is a professor of plant and soil sciences at The Pennsylvania State University, Berks Campus, Reading, Pa. You may reach Mike at [maf100@psu.edu](mailto:maf100@psu.edu) or on Twitter: @MikeFidanza for more information.

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# Golfdom Summit

2015 Highlights

“The Golfdom Summit was very well organized, professional and very educational. I think it was one of the best continuing education conferences I have attended.”

—JOHN F. ZIMMERS, JR., SUPERINTENDENT, OAKMONT CC

“Great resort, best networking opportunities I’ve ever had, informative, innovative and an all-around great time for everyone. It was a fantastic event, and will be one of the most memorable in my career.”

—KYLE JOHNSON, SUPERINTENDENT, INVERNESS CC

“Many thanks to Golfdom for a fantastic and well planned Golfdom Summit. A must-attend for all golf course superintendents.”

—ALEX J. STUEDEMANN, SUPERINTENDENT, TPC DEERE RUN



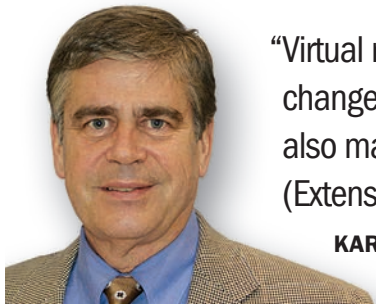
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“Virtual reality has the potential to change how we teach online, but also may enhance our outreach (Extension) efforts.”

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

## Turf education in the virtual world

**D**istance education has globally increased in popularity. Online certificate or degree programs reach a niche group of non-traditional students who desire an education or wish to improve their academic credentials without the stress of quitting a job and physically moving themselves and/or family. Online education has been around since the early 1980s, but the ability to present and provide a learning experience has taken off in the last 10 years.

Online education is not easy. For the student, it takes considerable self-discipline, motivation and time management to complete online requirements while at the same time balance work and family responsibilities. This often requires sitting in front of a computer by themselves late at night or early in the morning. Fortunately, advanced technology allows several turfgrass certificate programs to be accessed by phone or tablet, allowing students to access classes in places like airports, restaurants and hotels — anywhere with wi-fi.

On the opposite end is the creation of these courses and certificates by faculty. Turf management actually is suited for online learning. It's a visual and applied learning experience. We are able through videos, slide presentations, interactive programming (anima-

tions) and visual materials to describe and demonstrate the major activities involved in turfgrass management.

There always are challenges in making online education better, maybe even better than a classroom experience. One challenge: How do you best teach a student who is viewing a picture or video on a digital device in two dimensions when being in a lab or on a golf course is a three-dimensional world?

Virtual reality has the potential to change how we teach online, but also may enhance our outreach (Extension) efforts. Virtual reality gives us the ability to transport ourselves to a place where we physically are not. In the virtual world, we could place a student in the middle of a putting green, and that student could observe all the activities that are occurring.

Virtual reality is nothing new for

those of us old enough to remember having a View-Master (1939), which basically way a way to view famous sites by clicking a button. Other examples include the movie “The Lawnmower Man” (1992) and Nintendo Virtual Boy (1995).

By the 21st Century, professional virtual reality devices became complex. Multiple cameras were needed, and the videos had to be stitched together. The process was difficult and time consuming, often requiring professional expertise.

That has changed. A number of virtual reality devices will be released that shoot and stitch video in one process, and they're affordable (\$1,000 to \$4,000). The one I am playing with is much cheaper, around \$300, called the 360fly (360fly.com). There are limitations with the camera, but I can see potential for the industry as the technology advances. I can shoot 360-degree video through the camera that can be edited and streamed live or uploaded using a computer, tablet or smartphone. Using Google Cardboard (which costs only \$9), you can view video live or in virtual reality.

The ability to take a student who's in front of a computer on a journey to a golf course anywhere in the world (if you have the video) as if you were there has limitless potential. I also believe these devices have the potential to change how we interact in the industry.

For example, imagine you find an issue on one of your putting greens, and you would like some thoughts from trusted colleagues. You can place the camera, which is smaller than a baseball, on the green, and stream it live to your colleagues in three dimensions.

It would be for those watching like they were standing there with you. I think this technology is something to look at seriously.

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



# sUAS, sensors and golf courses

*Dale Bremer, Ph.D., is a turfgrass scientist at Kansas State University, where he conducts research using small unmanned aircraft systems (sUAS, commonly referred to as drones by laymen) and sensors on turfgrass research plots and golf courses to determine how to get value from this emerging technology. Contact Bremer at bremer@ksu.edu for more information.*

## **Q** Describe the technology of the unmanned aircraft systems and sensors available for use on a golf course today.

The technology of sUAS and sensors is changing rapidly. Whether a fixed wing or copter, sUAS are becoming widely available and affordable, more user friendly, and the quality and safety features are improving. The FAA in August 2016 issued regulations for the use of sUAS. These regulations should help speed up the development of all uses of sUAS, including potential use on golf courses.

Sensors are getting cheaper, easier to use and the quality is improving. We have used three general types of sensors in my research: a digital camera, a digital camera modified to collect data on specific bands of light and a thermal camera.

## **Q** How can a superintendent use sUAS and a sensor today on their golf course?

One of the simplest uses

today would be to fly a golf course with sUAS equipped with a digital camera. The superintendent could view the images and look for problems and patterns that may not be visible at ground level.

## **OPERATING sUAS AND ACQUIRING DATA ARE GETTING TO BE PRETTY STRAIGHTFORWARD. IF THE DATA ARE IMAGES FROM A DIGITAL CAMERA SHOWING THE GOLF COURSE, THAT CAN BE HELPFUL. INTERPRETATION OF NDVI DATA IS LESS CERTAIN.**

While I have not tried this, sUAS and digital camera, followed by processing the images with specialized software, could be used to fly a golf course being built or undergoing renovation to create 3D maps that would show elevations, contours, slopes and the position of features such as greens and bunkers. Superintendents can use this information to guide the design and construction of the golf course.

At this time, if a superintendent is using Normalized Difference Vegetation Index (NDVI) data, which is a

measure of plant stress, help interpreting the NDVI data will be required. While it is possible to collect the NDVI data from a golf course, interpreting the data is in its infancy. One of the challenges is to identify a problem while it is still minor, before it becomes a major problem.

Also, processing the data is a challenge. In general, sUAS flies a grid pattern

over a green or other area of the golf course, taking an image every two or three seconds. Because each image is of only a small portion of the green, all the images need to be stitched together using software (cloud-based data processing services are also available) to create a single image of the entire green. Next, the image needs to be analyzed and the data interpreted.

## **Q** What is your take about businesses offering a service to fly a golf course with

## **sUAS and provide data to the superintendent?**

Operating sUAS and acquiring data are getting to be pretty straightforward. If the data are images from a digital camera showing the golf course, that can be helpful. Interpretation of NDVI data is less certain. We are still learning how to interpret and use NDVI data for turf management.

## **Q** Anything else you would like to add?

I believe sUAS and sensors will become a regular part of the information gathered to help manage a golf course.

If you are considering using sUAS on your golf course, be aware that inadequate or poorly designed equipment is being marketed. Conduct careful research to ensure the investment will be capable of delivering the desired data. Also, please learn about the rules and regulations regarding sUAS use in your community and be aware of privacy concerns of golfers and people living in the homes that surround many golf courses. Finally, operating sUAS above people always should be a concern.



Clark Throssell, Ph.D., loves to talk turf. Contact him at [clarkthrossell@bresnan.net](mailto:clarkthrossell@bresnan.net).

# Professional Grade

NEW PRODUCT HIGHLIGHTS // GRAB BAG OF GOODS

## PLENITUDE OF PRODUCTS

SUPPLIES TO RENOVATE, MOW AND CLEAN UP

BY GRANT B. GANNON // Associate Editor

### 1. Better Billy Bunker Method

By eliminating geotextile liners, the **BETTER BILLY BUNKER METHOD** says it has improved on its original design. A 2-inch layer of local pea gravel is treated with a polymer designed specifically for use in bunkers. This layer of gravel provides drainage and allows water to flow to the drain tile. Draining at more than 1,500 inches per hour, the BBB method reduces washouts on the steepest slopes, in turn reducing maintenance costs, according to the company. The use of local gravel and the ease of installation makes the Better Billy Bunker method affordable for courses. By reducing man-hours spent on bunker maintenance, eliminating potential loss of revenue due to unplayable bunkers and protecting bunker sand, facilities around the world have realized a return on investment.

[Betterbilly.com](http://Betterbilly.com)

### 2. BigMo 34-inch Hydro

For all those places where a riding mower doesn't fit and a push-mower takes too long, now there's BigMo.

**SARLO POWER MOTORS**

introduces its BigMo 34-inch Hydro, a walk-behind mower. The BigMo features a 34-inch cutting deck, hydro transmission and a Twin Track Deck cutting system. This patented cutting system is an in-line spindle design built into a compact platform. The walk-behind mower is built with a 10.5-horsepower engine and hydrostatic drive system. The BigMo 34 Hydro offers seven cutting positions ranging from 1.5 inches to 4.5 inches, with no-tools height adjustment.

[Sarlomower.com](http://Sarlomower.com)

### 3. Gulp Ultramax Plus

For cleanups of water-soaked areas on turf and landscape, including valve boxes and sprinklers, the Gulp Ultramax Plus is now available from **UNDERHILL INTERNATIONAL**. The Underhill hand pump features three different models: a 36-inch length with a 72-inch hose; a 21-inch length with an 18-inch hose; and a 12-oz. syringe version. The Ultramax Plus O-ring and wiper seal, head assembly and intake foot/filter are removable for maintenance. An ergonomically designed handle allows comfortable operation, and a smooth, self-

### AFTER WATCHING TWO MAJOR CHAMPIONSHIPS

experience major bunker washouts this season, superintendents around the country might be questioning the quality of their own bunkers. If you're thinking about starting a bunker renovation we have a pair of solutions. We also have a hand pump to draw water from unwanted areas and another pair of recently released walk-behind machines.

priming action draws in an extra high volume of water. It is constructed with a clear, heavy-duty high-strength polycarbonate cylinder body and aluminum-grade pump shaft. The discharge hose connector is designed to stay intact during cleanouts.

[Underhill.us](http://Underhill.us)

### 4. Polylast Bunker Liner

**POLYLAST** Bunker Liner is a porous material that allows water to travel through and percolate down into the soil, preventing washouts. At the same time, the liner keeps sand clean from migrating rocks and dirt from the native subsurface. This patent-pending solution is made in the USA and pre-fabricated from 100 percent recycled rubber, which arrives ready to install. Installation involves placement of the pre-formed pads, of which the seams are glued together. The patented material requires no special heavy equipment or any certified installation crews. The material is flexible, allowing it to contour to the curves and dips of your bunkers while being strong enough to withstand the accidental scrapes from machine

raking, according to the company. Along the edges, Polylast Bunker Liner can be placed under the turf, creating a seamless edge while allowing the roots to grow.

[Polylastsystems.com](http://Polylastsystems.com)

### 5. 310 Walk Behind Turf Tender

Built at the request of superintendents, **DAKOTA'S** 310 Walk Behind Turf Tender is the most versatile, cost-effective and accurate spreader on the market, according to the company. This compact topdresser has a holding capacity of 12 cubic feet, with a spreading width of up to 20 feet, and is engineered to spread a wide variety of materials, light to heavy, wet or dry. The 310 features twin spinners, making it the most accurate high capacity walk-behind on the market today, Dakota says. The 310 is powered by an 11-horsepower Honda engine with an electric start and a hydrostatic drive. For tees, greens or other small places, the 310 Walk Behind Turf Tender is a durable, compact spreader.

[Dakotapeat.com](http://Dakotapeat.com)





# The 19<sup>th</sup> Hole

SOFT SPIKES ONLY

## Woody Moriarty

**SUPERINTENDENT** // Blue Hills CC, Kansas City, Mo.



**Woody, what can I get you?** Jim Beam and Seven, tall.



**How do you spend an ideal Saturday?** I have three kids and I'm a big sports fan. I like keeping up with my kids' sports. The girls (ages 20 and 18) play basketball and volleyball. I coached the girls in basketball. Football, baseball and basketball for my son, he's a sophomore.



**Favorite movie of all time?**

The Godfather.

**Have you tried Topgolf yet?** No, but I'm just not into it. I like the environment of being outside and playing golf, not hitting into a bunch of bells and whistles or a light show.

**Blue Hills hosted the Tom Watson Children's Mercy Classic for a long time. Any memories stand out?**

My first year I had the five great golfers: Jack Nicklaus, Arnold Palmer, Tom Watson, Gary Player and Lee Trevino. I was impressed by the way Palmer was so nice to everyone. Palmer is walking out the door to go play, and one of our members says, "Mr. Palmer, Mr. Palmer!" Palmer thought he was going to get another question. And then the member says, "Did you know we have a soft spike rule here at Blue Hills?" Palmer turned around real calm and said, "Today you don't have a soft spike rule."

**If you could change one thing about golf, what would it be?** We're under a

complete bunker reconstruction, we're

doing it in-house... it chaps me how much time is spent on bunkers. It's a hazard. Now you hear the pros would rather be in the bunker than the tall rough. Did you see the Ryder Cup and how they rolled the edges? It sets a precedent. I like to pay attention to detail, but at some point it's too much. Golfers are pampered.

**Are you a big Kansas City barbecue fan?** I bet there's

20 good barbecue joints here in town. I love the varieties, and there are a lot of new ones popping up. But I'll stick with Gates for my double-decker beef sandwich, and Gates for the actual sauces. But Jack Stack has the best burnt ends and beans in Kansas City.



**What teams do you root for?** I grew up in

Kansas City, I went to the old ball parks for both the Royals and the Chiefs. But I'm a die-hard Royals fan and a K-State Wildcat.



**How have you changed with the changing times?** Well... I've gained

weight, and I hired more assistants — how's that? I've gained 30 pounds but I've been able to hire three assistants rather than two.

**It's all that barbecue.** Like I said, I love the different varieties.

As interviewed by Seth Jones, Oct. 25, 2016.



**"I LIKE THE CAMARADERIE (OF THE INDUSTRY). ALL THE SUPERINTENDENTS WORK TOGETHER, TALK TO EACH OTHER, AND I LIKE HOW PROGRESSIVE WE HAVE BEEN. I HOPE WE KEEP THAT UP."**

MAIN PHOTO BY: PETE SELTZER



# RG3

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– John Shaw, CGCS, Valley Brook CC

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