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# Golfdom

03.16


## THE ADMIRAL OF ULTRADWARFS

Jared Nemitz of The Peninsula Club takes charge of his greens, and his career, with a military-like precision

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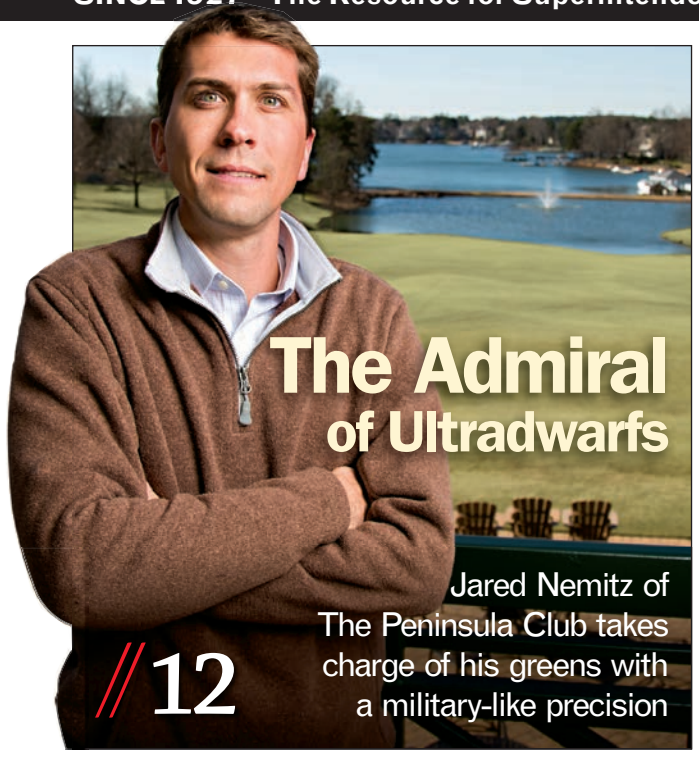

# The Admiral of Ultradwarfs

Jared Nemitz of The Peninsula Club takes charge of his greens with a military-like precision

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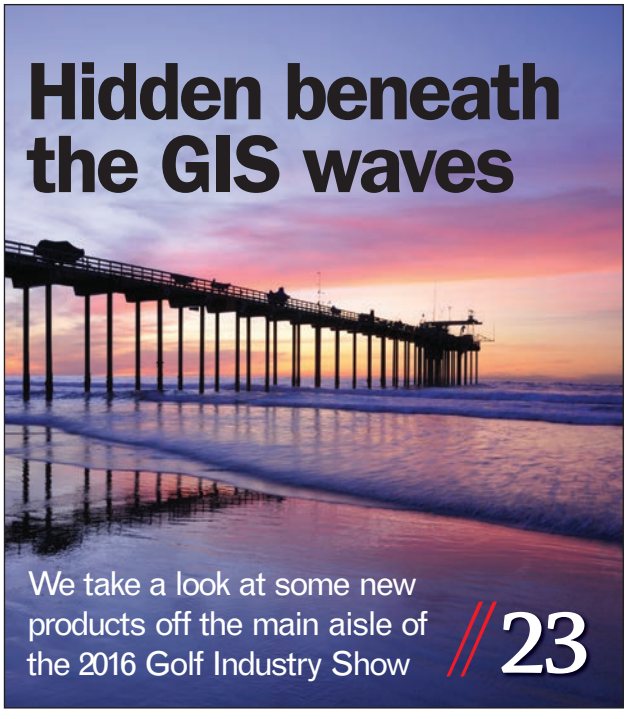

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We take a look at some new products off the main aisle of the 2016 Golf Industry Show

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# Golfdom

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"It took three months for Nemitz to figure that out (who he is). I'm impressed. It took me about three years."

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

# Identifying your identity

Jared Nemitz, who you saw on the cover of this magazine and know by now as the winner of the 2016 Herb Graffis Businessperson of the Year award, told me that he was miserable in his first couple of months as an assistant superintendent. Here's a guy who, as his general manager says, "lives, eats and breathes agronomy." Or as Nelson Caron told me, "he was one of those interns you had to ask to go home."

That guy was miserable?

It was because Nemitz hadn't yet figured out his own identity. He was young and still trying to find his way. "I tried to be every assistant superintendent I had seen before," Nemitz told me. "I was trying to mimic the other guys on staff."

Three months into his job, Caron pulled him aside and gave him some advice. *"Stop being those guys and be yourself. Go after your strong points. Be who you are and just go get it."*

That's when Nemitz found his way. He told me he learned from others, while at the same time developed who he was. He knew he loved Excel spreadsheets, so he started using them to help him identify what he was seeing in the field.

It took three months for Nemitz to figure that out. I'm impressed. It took me about three years.

When I started working at GCSAA 17 years ago, I was paranoid about my lack of golf experience. I didn't grow up living on a golf course, I didn't have a turf degree. My first round of golf was at age 20.

All I had was a degree in journalism and a love for sports and sports reporting.

I remember attending seminars at the Golf Industry Show and asking dumb questions. I took a job working weekends on a maintenance crew and sustained dumb injuries. (Nothing serious, but it's amazing how much sharp debris flew off my string trimmer.)

It took me years to realize that my weakness also was my strength. Rather than struggling to learn the science of turf, I simply took my love for sports journalism and applied it to my job as a reporter covering the turfgrass industry. So what if the questions I asked were dumb? The answers I got back were not.

That led to better and better stories. First it was unique golf operations and personality profiles, then it was Old Tom Morris Award winners (Greg Norman, Nick Price), then it was a string of dozens of celebrity golfer interviews (Yogi Berra, Charles Barkley, Samuel L. Jackson.) All that led to this job and holding a position once held by World Golf Hall of Famer Herb Graffis.

Jared talked to me about one of the skills he believes makes him an asset to the members at The Peninsula Club: his ability to take pages and pages of data and boil it down to something members — who are not turf experts — can understand. He takes soil pHs, clipping yields, fertility programs, and puts it in golfer terms.

He starts from a high level and brings it down.

I'm the opposite. I start from a low level and work up. Instead of pages and pages of data, I take pages and pages of interview transcripts (for this story, there were 63 pages of transcribed interviews, all in my own shorthand) and try to make the best story — for turf experts — out of it.

This is the fifth Graffis Award we've given, and it was, again, a fun experience. I think after reading his story you'll agree that Jared is deserving of this award. You might not go out and start weighing your clippings, but Jared's story is a good one.

I hope my dumb questions did it justice.

**Email Jones at:**
**sjones@northcoastmedia.net.**

# Starter

NEWS, NOTES AND QUOTES

Chairman of ChemChina Ren Jianxin (L) gestures to Michel Demaré, chairman of Swiss farm chemicals giant Syngenta, during a press conference to present Syngenta's annual results at the company's headquarters in Basel, Switzerland. State-owned China National Chemical Corp offered $43 billion in an agreed takeover for Swiss pesticide and seed giant Syngenta, in what would be by far the biggest-ever overseas acquisition by a Chinese firm.

//NEW ACQUISITIONS

## CHEMCHINA TO ACQUIRE SYNGENTA

China National Chemical, a Chinese government-owned pesticide and agrochemical company known as ChemChina, has offered to acquire Swiss-based agricultural company Syngenta for $43 billion in cash. The deal is expected to close by the end of the year.

"In making this offer, ChemChina is recognizing the quality and potential of Syngenta's business," says Michel Demaré, chairman of Syngenta. "The transaction minimizes operational disruption; it is focused on growth globally, specifically in China and other emerging markets, and enables long-term investment in innovation."

Syngenta's global headquarters will remain in Switzerland, and its management team and staff will remain intact, according to Syngenta.

The company's statements have emphasized the transition will be "business as usual" for customers and employees. Syngenta representatives excitedly shared this same sentiment when *Golfdom* met with them during the 2016 Golf Industry Show in San Diego.

"We will continue to work alongside the management and employees of Syngenta to maintain the company's leading competitive edge in the global agricultural technology field," says Ren Jianxin, chairman of ChemChina. "Our vision is not confined to our mutual interests, but will also respond to and maximize the interests of farmers and consumers around the world."

The deal continues a green industry trend of consolidation. In December, DuPont and Dow Chemical merged into DowDuPont. Before merging, the two companies generated a combined $92 billion in sales.

//GOLFER-IN-CHIEF

## MURPHY TAPPED AS NEXT USGA PRESIDENT

**Diana M. Murphy, of St. Simons Island, Ga., was elected to serve a one-year term as the 64th president of the United States Golf Association (USGA).**

Diana Murphy

**"Although golf will always face challenges, the great golfers — such as Bob Jones, Ben Hogan, Arnold Palmer, Jack Nicklaus, and my dear friend Louise Suggs — had one trait in common: They were optimistic about their games and the game," said Murphy after her election. "It is a time for all of us, together, to be positive about golf and act accordingly."**

**Murphy has been formally associated with the USGA since 1996, when she began a 12-year tenure on the USGA Membership Committee. She joined the Executive Committee in 2011 and has chaired several committees. She was elected treasurer in 2013 and vice president in 2014 and 2015.**

**She is the second woman in the association's 121-year history to serve as president, following Judy Bell, who was president in 1996 and 1997.**

//GOLDEN TICKETS

## SUMMIT PASSES SOLD!

**Two "golden tickets" for the *Golfdom* Summit sold at two different charity auctions for $1,500 each, netting nice donations for the Wee One Foundation and the Environmental Institute for Golf.**

**The first pass went to David Radaj II, CGCS at Green Acres CC in Northbrook, Ill. Radaj scored the winning bid at the 7th Annual Midwest Association of Golf Course Superintendents Meeting and Wee One Fundraiser. The second pass sold at an online auction following the Golf Industry Show to Dane Gamble, Bridger Creek GC, Bozeman, Mont., as part of a fundraiser for the EIFG.**

**Superintendents interested in applying for the *Golfdom* Summit, the industry's premier, invite-only event, can apply at GolfdomSummit.com. The event will be held Dec. 6-9 at the Reunion Resort in Orlando, Fla. And Dave and Dane, we look forward to seeing you both there!**

PHOTOS BY: MICHAEL BUHOLZER/AFP/GETTY IMAGES; ISTOCK.COM/WELLGLAD (GOLF BALL)

//HEALTHY DONATIONS

# PGA Tour commits $250K to promote BMPs

The PGA Tour will contribute $250,000 over five years to the GCSAA's Environmental Institute for Golf to help implement best management practice models for golf courses, with a focus on localities and states in which PGA Tour events are held.

The PGA Tour is joining the U.S. Golf Association in an industrywide effort, spearheaded by the GCSAA, to establish best management practices (BMPs) across the country.

"We believe in the good work that golf course superintendents are doing every day to establish quality, healthy playing conditions for all golfers while protecting our environment," says Tim Finchem, PGA Tour commissioner. "Best management practices will help us demonstrate that golf courses can deliver benefits to everyone in a community."

**"Best management practices will help us demonstrate that golf courses can deliver benefits to everyone in a community."**

The goal is to have BMPs in place in all 50 states by 2020, providing resources to help superintendents and increasing credibility for all professional land managers, according to a press release. Currently, BMPs are in place in some form in 11 states: Colorado, Florida, Georgia, Michigan, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont and Virginia.

"Best management practices are essential to all superintendents to measurably demonstrate that we are doing the utmost in our profession to care for the land while providing the best conditions possible for golfers," says Jeff Plotts, director of golf course operations at TPC Sawgrass.

//SOLEMN NOTICE

# TRAGEDY STRIKES MOWER COMPANY

Tragedy struck in Hesston, Kan., in late February when a gunman entered Excel Industries and opened fire. Three people were killed and 14 were wounded. The shooter, an employee of the company, was killed by police at the scene.

Excel Industries, located north of Wichita, produces mowers for the fine turf industry. Hustler and Big Dog Mower Co. are two of the brands the company manufactures.

"Excel family is deeply saddened by the horrific event… our hearts go out to our employees and their families who are enduring this tragedy," Excel Industries CEO Paul Mullet said in a statement.

On behalf of *Golfdom*, our sister publications *Landscape Management* and *Athletic Turf*, and all our publications at North Coast Media, our heartfelt prayers and thoughts are with all of those affected by this terrible tragedy.

PHOTO BY: SETH JONES


**CONGRATS TO OUR PAL VAUGHN TAYLOR,** who went from an alternate to shooting 17-under to win the 2016 AT&T Pebble Beach Pro-Am. We're happy that Vaughn found his "fix" and are looking forward to seeing him play in a little tournament that's hosted every year in his hometown of Augusta, Ga.

//GOOD OLE ROCKY TOP

## REDEXIM ADDS TERRITORY SALES MANAGER

**Redexim Turf Products, the factory-direct store for Redexim North America based in Valley Park, Mo., has named Michael Crawford its territory sales manager for the state of Tennessee.**

**Crawford, who will be based in Knoxville, joins the Redexim Turf Products team with experience on the golf course side of the turf industry. He graduated from the University of Tennessee with a degree in Turfgrass Science and Management in 2007. Crawford interned at Knoxville's Fox Den Country Club while in school, and after graduation he moved up to assistant superintendent, a position he held for more than eight years.**

Michael Crawford

//GOLFDOM WISDOM

**Political statements at work are never wise… unless you work at one of Trump's 16 courses, then rock that "Make America Great Again" hat daily.** #golfdomwisdom

# Golfdom Gallery








**1 The end is nigh** At the Golf Industry Show in San Diego, some late-night marketing about the end (of nematodes) was on display with these two sandwich board street preachers, courtesy of Bayer Environmental Science and their upcoming nematicide Indemnify.

**2 Keeping up with the Joneses** The Golf Course Builders Association of America stopped by the *Golfdom* booth to talk turf, represented by new president Scott Veazey of Southeastern Golf (second from left) and GCBAA Exectuive Director Justin Apel (far right). Rees Jones and Seth Jones were all ears.

**3 Propellor heads** The John Deere GIS party was on the historic USS Midway, where we spotted (L to R) Kevin Whitten (TPC Craig Ranch), Alex Stuedemann (TPC Deere Run) and James Brinkmeyer (TPC San Antonio).

**4 Fond of Florida** Our pal Rickey Craig, superintendent at Shingle Creek (center, in red) was holding court with a group of turf pros from his home state. Bound by tradition, Seth dove in for the photo opp.

**5 Backed by Bayer** Luke Cella, CGCS, executive director, Wee One Foundaton, was presented this oversized check at the recent Midwest AGCS meeting in Chicago by John Turner, Bayer.

**6 Movin' on up** Joe Schneider (Maple Meadows GC) and Aaron Reinhart celebrate Reinhart's new gig with the local parks department.

**7 Illinois boys** Kevin DeRoo (Bartlett Hills GC), Bill Meyer (Park Ridge CC), Steven Biehl (Naperville CC), Brett Ziegler (ProGro Solutions), Brian Stout (Arboretum GC), Ryan Williams (Indian Hill Club) and Shane Conroy (GCSAA Field Staff) of the MAGCS.

PHOTOS BY: SETH JONES (1, 3, 5-7); RYAN BOCKMULLER (2)

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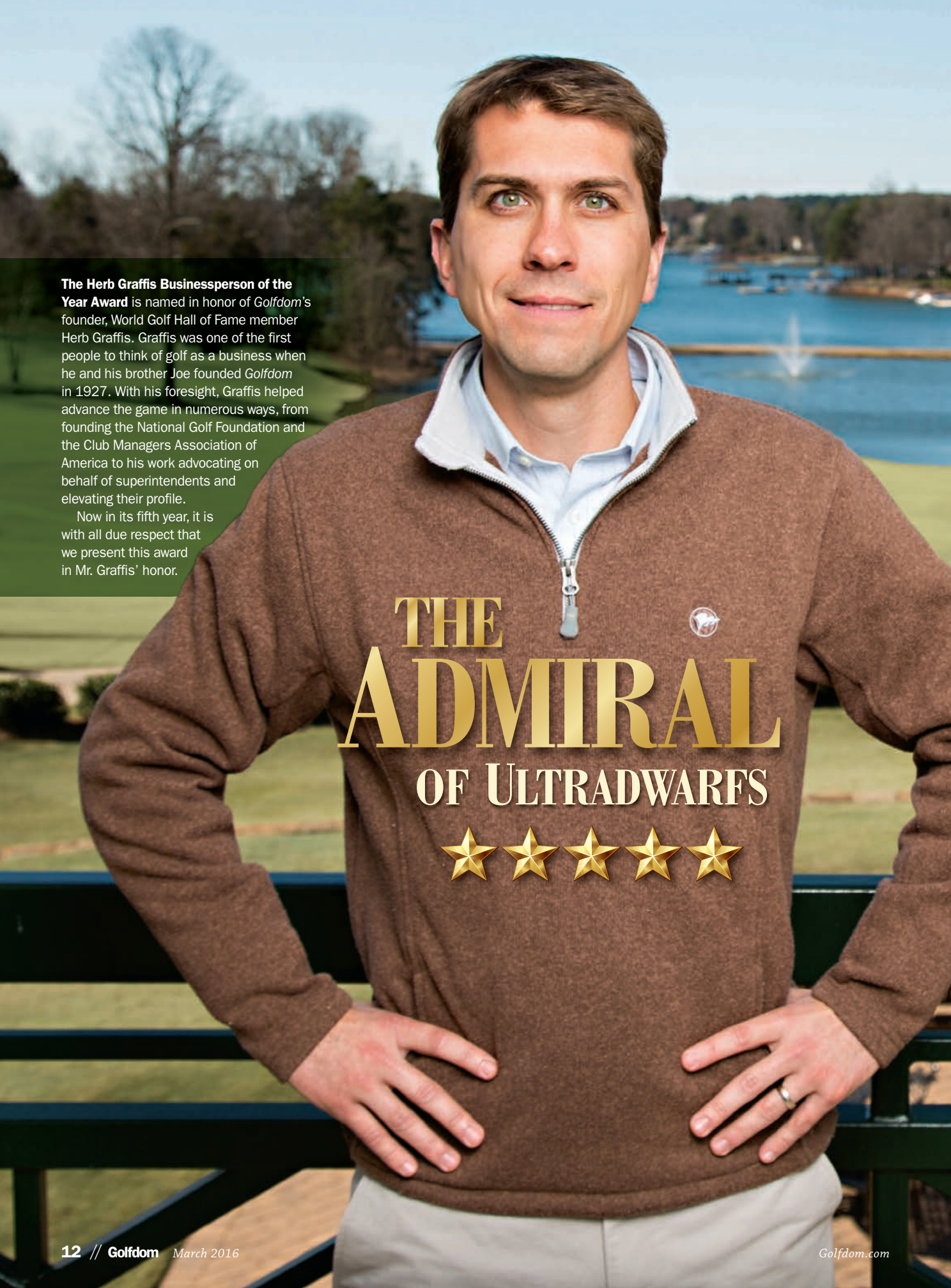


**The Herb Graffis Businessperson of the Year Award** is named in honor of *Golfdom*'s founder, World Golf Hall of Fame member Herb Graffis. Graffis was one of the first people to think of golf as a business when he and his brother Joe founded *Golfdom* in 1927. With his foresight, Graffis helped advance the game in numerous ways, from founding the National Golf Foundation and the Club Managers Association of America to his work advocating on behalf of superintendents and elevating their profile.

Now in its fifth year, it is with all due respect that we present this award in Mr. Graffis' honor.

# THE ADMIRAL OF ULTRADWARFS

# ULTRA-SMART, ULTRA-METICULOUS AND ULTRA-DRIVEN

## Jared Nemitz of The Peninsula Club takes charge of his greens, and his career, with a military-like precision

**BY SETH JONES**

The 10th hole at The Peninsula Club, Cornelius, N.C., is a 565-yard par 5 from the tips. ¶ That's common knowledge, right on the scorecard.

What's not common knowledge is that this green, conveniently located near the maintenance facility, had 345 pounds of grass cut from it in 2015. It had 18,765 pounds of sand applied to it. It was mowed 250 times, rolled 135 times, verticut 43 times and covered 33 times. Its average hight of cut was .130, its average Stimp reading was 11.3.

It's not important to The Peninsula Club's members that the crew takes these meticulous measurements daily. These numbers mean absolutely nothing to the common golfer.

It is important to them that this Champion ultradwarf bermudagrass green, like its 18 siblings on the property, is the smoothest and truest it has ever been.

The superintendent behind this success is Jared Nemitz, winner of *Golfdom*'s 2016 Herb Graffis Businessperson of the Year award. In only 10 years, the Purdue graduate (Bachelor of Science, 2006; Master of Science, 2009) has gone from analytics-driven bentgrass grower to one of the nation's leading experts on ultradwarf bermudagrass.

How has he done it? With hard work and dedication... by listening and learning... by combining a green thumb with a vivid understanding of science and thorough documentation.

But when it comes to impressing golfers, hard work and numbers don't speak for themselves — it takes an appreciation for business and results to bring it all together.

### Hungry intern

While it might not feel like it to Nemitz, he's come from humble beginnings to the top of the profession in a short time.

Only 33 years old, Nemitz's career path prior to The Peninsula Club includes premiere courses with legendary superintendents like Chevy Chase Club, Washington, D.C., where Dean Graves is CGCS; Honors Course, Ooltewah, Tenn., where David Stone is superintendent; and Ford Plantation, Savannah, Ga., where Nelson Caron presides.

Not bad for a Tennessee kid who can remember living in a rented attic with his mom, dad and brother, or the college student who made rent donating plasma twice a week.

"I got $30 for the first visit, if you came back that same week you got a $50 bonus," Nemitz recalls. "That $80 a week paid rent every month. But it also made drinking really cheap — my blood was so thin, one beer and I was toast."

It was at the Honors Course where Nemitz met his mentor and friend, Nelson Caron, now the superintendent at Ford Plantation. Caron could tell early on that the new intern was cut from a different cloth.

"He has this understanding of turfgrass that others wish they had," Caron says. "And he was one of the hungriest interns I've ever had. He was one of those interns you had to ask to go home."

*Continued on page 14*

PHOTO BY: PETER TAYLOR

*Continued from page 13*

The Admiral of Ultradwarf didn't abide by typical college kid rules, it seems.

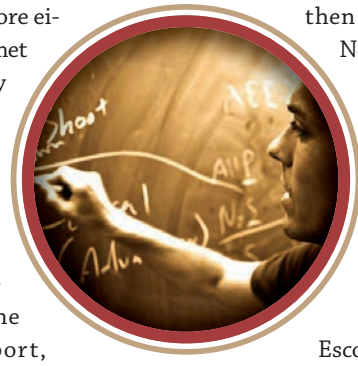
"We knew we had someone special when all the kids went to spring break, and most of them went to Panama Beach," Caron recalls. "Jared came back to the Honors Course and we rebuilt the third green — 12 days of hard labor."

Nelson Caron, Pete Dye and Jared Nemitz, pictured during their time together at Ford Plantation.

## Life-changing call

Caron was hired in 2008 as superintendent at Ford Plantation, and called on his friend and colleague Nemitz to join him at the course.

He had a mission for Nemitz. He wanted him to use his master's degree and all the fancy Excel spreadsheets he's known for to scientifically prove that Ford Plantation should switch from ultradwarf bermudagrass to bentgrass. At the time, Nemitz had been a bentgrass/*Poa* guy his entire career. He was happy to accept the challenge.



This was before either of the two met with Rodney Lingle, CGCS, then superintendent at Memphis CC.

"I remember Nelson calling me from the Memphis airport, and he said, 'Jared, your life is about to change forever,'" Nemitz recalls.

The cause of Caron's call was a visit to the USGA's Ultradwarf Bermudagrass Workshop, hosted by Lingle. Caron remembers the workshop, and that phone call, "like it was yesterday."

"I had an incredible experience, it ended up being a life-changer for me and my staff," Caron says. "I've been to all the best clubs in the world, I mean that. When I set foot on those greens at Memphis CC, they were the best I'd ever seen. It dawned on our team: We had the same resources as Memphis CC, we were just as smart, and now we had a road map. I called Jared and said, 'Stop everything you're doing.'"

Caron taught Nemitz what he could, then sent him to see Lingle himself. Nemitz was equally impressed.

"Lingle is the Godfather — he paved the way for ultradwarfs," Nemitz says. "He was busting down doors with ultradwarfs when people were just making fun of him, saying they'd never take off."

Lingle is now superintendent at Escondido Lake & Golf Club in Horseshoe Bay, Texas. Despite the hundreds of turf pros he schooled over the years of hosting the event, Lingle says both Nemitz and Caron stood out, and probably have surpassed him.

"I told those guys I'll be greatly disappointed if in 10, 15 years from now, when I'm retired, if you haven't taken what I've done and blown it out of the water," Lingle says. "Jared is so good, he's one of two guys in the world that if I needed someone to help me with my greens to save my life, he'd be one of the two I'd call." (The other superintendent? Josh Cook, Oak Tree National Golf Club, Edmond, Okla.)

## Live, eat, breathe agronomy

Caron and Nemitz implemented Lingle's program at Ford Plantation to great success. Caron was promoted to a director, and Nemitz took his position as superintendent.

But Nemitz had a goal to be a superintendent on his own by age 30, and time was running out. Enter The Peninsula Club, a Rees Jones design built 25 years ago that, like more than 500 courses, had converted its greens to Champion ultradwarf. COO Ray Armini, CCM, was seeking an "up-and-coming star" to manage the new putting surfaces to peak potential.

"I was very focused on finding someone who was familiar with Champion bermudagrass," Armini recalls. "But we picked Jared because of his passion — you can tell he lives, eats and breathes agronomy and grass."

Armini says the 2016 Graffis Award winner is one of the best hires he's ever made. For Nemitz, now a father of two (Ainsley, 3, and Gavin, 5 months), he calls the hiring "a weight off my shoulders."

"I applied for 30 jobs... if you don't

*Continued on page 16*

"(My master's degree) taught me how to present all this massive data and condense it for people who don't understand the industry very well," Nemitz says.

PHOTOS COURTESY: JARED NEMITZ

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*Continued from page 14*

know someone, the résumé doesn't get you an interview," Nemitz says. "I got the job at 29, two months later I turned 30. That goes back to setting goals — it's amazing how goals happen when you set them."

5-month-old Gavin, Rachael, Jared and 3-year-old Ainsley Nemitz enjoying the aquarium.

Nemitz was primarily hired to improve The Peninsula Club's greens. He quickly learned that he was also brought on to help create a master plan to improve the entire course.

"On my first week of the job, I was meeting with Greg Muirhead (of Rees Jones Design) to go around and start master planning," Nemitz says. "Muirhead had to drive the cart, I didn't know where to go. Greg is driving me around saying, 'OK, this is No. 1....'"

## No pressure

The next year, Lingle was changing jobs, and the Ultradwarf Bermudagrass Workshop was looking for a new home course. The USGA's Patrick O'Brien, agronomist for the Southeast Region, knew where he wanted it to go: The Peninsula Club, despite Nemitz being in only his second season.

"He was implementing all these practices, and it was working to perfection," O'Brien says. "His greens are always in spectacular condition."

"I never felt like I was worthy," Nemitz says. "I was still learning how the grass reacts. When 50 superintendents come in, and none of them are younger than me... it was intimidating because I respect all those superintendents, and I didn't want to mess up."

Nemitz and his crew stepped up to the task, and the meeting has found a new home. The event returns to The Peninsula Club on June 27th. O'Brien also asked Nemitz to write an article for the USGA's Best Management Practices case study website. (Visit **Golfdom.com** for the link.)

"Jared is definitely deserving of this award," O'Brien says. "He's one of the smartest agronomists I've met in my time with the USGA."

"Jared wants to see career growth, but also personal growth," says first assistant Nick McLennan.

## Excel excellence

Nemitz clearly knows his ultradwarfs, but it was his dedication to detailed record keeping that first caught the attention of *Golfdom* (sharp-eyed readers will recognize Nemitz from the magazine's July 2015 19th Hole interview, where he happily called himself a "turf nerd.")

Excel spreadsheets are seemingly Nemitz's hobby. He's a meticulous record keeper, charting measurements daily, like the clipping yields from No. 10 green.

O'Brien says that while Nemitz's practice of charting something such as clippings yield isn't unheard of, the detail in his work stands alone.

"The record keeping that he has done is very precise, and it's good metrics to have as a superintendent," O'Brien says. "I think he's the type of new modern agronomist that really fits into this industry well."

The best thing about this data, Nemitz says, is he can translate it for the member.

"(Members) all do some type of business, 100 percent of them," Nemitz says. "If I start throwing around soil pHs, they are going to ask me what the heck I'm talking about... but when I can equate data to a bottom-line dollar, that's what they appreciate. Show them where the money is going — it's results-based planning."

Lingle remembers looking at Nemitz's spreadsheets and being equally impressed and dismayed.

"He showed me a very detailed log when he was at Ford Plantation, and I asked him, 'When do you have time to do anything else?'" Lingle laughs. "He's good at it and can do it quickly... more power to him — I can't work that fast."

*Continued on page 18*

Nemitz will again host the USGA's Ultradwarf Bermudagrass Workshop in June. "Our greens are our pride," Nemitz says. "Good greens make the hot dogs taste better at the turn."

PHOTOS COURTESY: JARED NEMITZ. BY: PETER TAYLOR (MCLENNAN)

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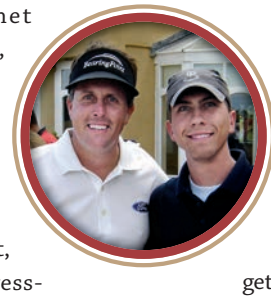
*Continued from page 16*

So how does Nemitz find the time? Easy… he doesn't do it anymore.

"I put it on my team," Nemitz says. "My tracking of things is very little today. I give it to (the assistants) because I want them to learn. I want my guys to learn why we make decisions, and they're a part of those decisions. I believe I was mentored very well, I want to make sure I'm a good mentor to them."

First Assistant Superintendent Nick McLennan, who met Nemitz at Ford Plantation, admits that all the Excel spreadsheets were a lot to take in at first, but now it's second nature. McLennan is tasked with charting Stimp readings, height of cut, greens applications, topdressing amounts and daily observations on greens conditions. An example entry from Dec. 27th, 2014: "Greens look great and still have abundant moisture. Many full leaf blades visible." The green was Stimping at 11.6 with a .175 height of cut.



"When it's a daily assignment, it doesn't take that much time. It only takes two minutes," McLennan says. "This is what makes me happy, learning how to manage."

The maintenance team at The Peninsula Club includes (left to right) Drew McRorie (second assistant), Taft Burrell (second assistant), and Nick McLennan (first assistant) with Nemitz.

While Nemitz enjoys having the detailed reports, he stresses that data isn't everything.

"You can't get away from the green thumb. I don't care what any number says, if it looks bad it looks bad," he says. "I take the green thumb and combine it with science and put it in a business person's language. That gets us ahead."

## Big goals

Nemitz wasn't always destined for a career in turf. He once talked to a recruiter for the Marines. A World War II history buff, Nemitz is a fan of legendary WWI and WWII veteran Admiral Chester Nimitz. He thought the military lifestyle might be right for him.

But he also loved working on the crew at Bent Oak CC in Elkhart, Ind. When the superintendent there suggested he look into turfgrass as a career — he had not considered it until then — he soon found himself enrolled at Purdue.

His turf life has taken him around the world. He studied at the University of Aberystwyth in Wales; he worked on the crew at St. Andrews during the 2005 Open Championship; he was a speaker at the European Turfgrass Society meeting in Pisa, Italy.

"I never would have thought in a million years that a little kid weed-eating to 9 p.m. at night could go to the *Golfdom* Summit, or speak across the country," Nemitz says. "It's amazing where the industry is going, the professionalism, and how guys are developed. I'm pretty proud to be a part of it, and I'm proud of where we're going."

Nemitz credits hard work and his mentors for his success. He mentions his dad, Randy Nemitz, who taught him his work ethic. Randy worked a variety of jobs before becoming a pastor. Nemitz knows how hard his father worked to get his family out of that rented attic.

Nemitz and his crew have their sites set firmly on their next goals of the master plan. Stabilizing the lake banks, an updated pump system and then a bunker renovation are all on the horizon.

For Nemitz personally, he has a bigger goal: He wants to be the next Dean Graves of the industry, an admirable goal.

"I have a great wife, a great general manager, a great club, great assistants," Nemitz says. "When you have all these things, you have harmony. You're blessed. Right now, all these things are coming together, and it's showing."

On being a superintendent, Nemitz says, "There's a business side, a science side, and a green thumb. Those three things I'm always trying to combine. It's a lot of fun."

PHOTOS COURTESY: JARED NEMITZ

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# Hidden beneath the GIS waves

BY GRANT B. GANNON AND ED HISCOCK

With almost 13,000 attendees, it can be easy to miss a product helpful to a superintendent among the sea of more than 500 booths at the 2016 Golf Industry Show in San Diego.

It doesn't matter if you sailed west to the show or were stranded at home, because the S.S. *Golfdom* scoured the ocean of big fish exhibitors all the way down to the tidal pools of guppy booths for products that can aid superintendents.

## It doesn't have a U.S. address, but it looks just like a Baroness

The U.K. was on the floor of the Golf Industry Show in San Diego with a number of products that superintendents "over there" have seen before but are new to this side of the pond.

Perhaps chief among them for the U.K.-based company Baroness was the GM2810, a five-unit mower that is the company's "premium" ride-on rotary, boasting five rotary decks that individually follow hilly terrains and slopes.

The big selling point, according to Stuart Gray of Baroness, is the sheer variety of areas in which the unit can operate, including around bunkers and trees, where other big mowers have a hard time.

The company says the GM2810 has the widest cutting width

*Continued on page 24*


Baroness GM2810

ISTOCK.COM (PAULE856)

*Continued from page 23*

in its class while rivaling the turn radius and mobility of smaller mowers.

The unit's climbing ability comes from a Kubota large displacement turbo clean engine and original hydraulic circuit drive system, which makes embankment mowing much easier, the company says.

Even the design makes a statement, the company says, and is inspired by Japanese swords to express "sharp cut" and "agility." The 4,585-pound unit cuts 4.9 acres per hour.

Asked to sum up the GM2810's advantages, the Hampshire-based Gray said the task is easy. "Ease of maintenance, quality of cut. It's got the most horsepower in its class of any of unit in its market, and it has a standard three-year warranty, which is a year more than any other manufacturer." In addition, he noted that "the average blade life for a Baroness, for a rough mower, is a thousand hours."

PrecisionUSA's The "Original" Green Sweep

## Sweeping sand without the broom

When it comes to various golf course maintenance practices like topdressing, there are plenty of fish in the sea. The "Original" Green Sweep could be lost among the school of products grouped along with it in the PrecisionUSA booth because it has a simple look, but it yields very visible results.

This product allows superintendents to reduce turf stress and help get sand down into the soil when topdressing. Its goal is to reduce stress caused by dragging chain drag mat or brush behind a cart, and saving time compared to a group of crew members using brooms to work the sand into the soil, says the company.

It's 24 inches long with a 5.5-inch by 5.5-inch opening that attaches with existing hardware to most walk-behind blowers with a rectangular output port and can be used on putting greens, tee boxes and approaches.

A seal is created between this product and the blower that directs the air pressure through a specifically designed set of holes and forces the sand down in the soil. If a user quickly needs to user the blower for it's intended function, the "Original" Green Sweep folds up and can be held in place with a bungee cord.


Cushman's Refresher Oasis

## A welcome Oasis on the course

If you traversed the Golf Industry Show trade show floor in San Diego and happened to come upon something with a cooler, glass-doored cupboards and enough counter space for a small kitchen, don't worry, you didn't wander into a model house boat. What you were taking that cold drink from was the new Cushman Refresher Oasis, designed and manufactured by Textron.

The company's latest entry into its food-and-beverage and point-of-sale vehicle line features four beverage compartments with a mammoth 500-can capacity. The Oasis was designed for facilities needing a large-volume vehicle, and if it had been around a few decades ago you might have been tempted to live in one. Pretty sure the company wouldn't recommend that, though.

The Oasis provides "another opportunity to increase revenue through on-course beverage and merchandise sales," ac-

*Continued on page 26*


Cushman's Refresher Oasis

PHOTO COURTESY: CUSHMAN (TOP) / PHOTOS BY: GRANT B. GANNON, ED HISCOCK

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*Continued from page 24*

cording to Michael R. Parkhurst, vice president, golf, for Textron Specialized Vehicles. "Its ability to carry large loads makes it an ideal solution for on-course refreshments, supporting large tournaments and special events."

The model is the latest in Cushman's Refresher line. Besides the can capacity, it boasts a 12.1-square- foot wraparound counter, convenient trash and recycling receptacles and a 6.7-cubic foot merchandising/dry goods cabinet (the glass-doored cupboards mentioned earlier). Courses have the option of adding airpots in which to serve morning or afternoon beverages, and customers can order the Oasis, counter, refresher unit and canopy in optional colors.

The Refresher Oasis joins the FS2 and FS4 in the Refresher product line. Both of those models have what Cushman calls "FlexServe Technology," which gives courses the flexibility to change merchandising modules.

## Plugging up the bunker leaks

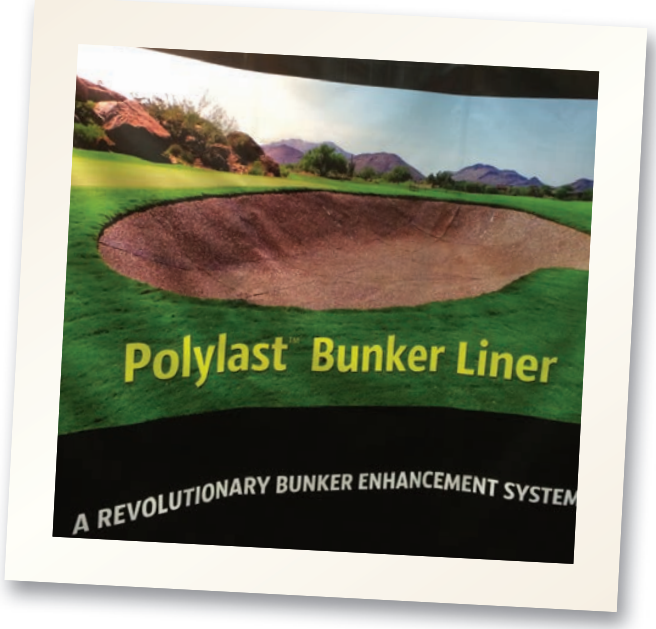
The Polylast Bunker Liner, made out of 100-percent recycled rubber and proprietary urethanes, is for superintendents looking for environmentally friendly solution for leaks in the hull of their bunkers.

According to Polylast's Pete Laurence, the company has a patented process of encapsulating recycled rubber with a pretreatment of chemicals that when bound with urethane becomes extremely strong, "stronger than almost anything else."

Polylast improves water flow to drain systems in bunkers, Laurence says, to prevent flooding and washout while protecting sand from migrating rocks and dirt from the native subsurface.

The prefabricated liner is delivered ready to install, and requires only the placement of the preformed pads. The seams can be stapled or glued together.

"We pre-form the pads, which are three-eighths of an inch think, at our facility and ship them," he says. "Installation is done by picking up a pad or a roll, laying it in the bunker, butting the edges, and some people like to use staples, some don't, then using a binder to seal the edges."




Yamaha's YamaTrack

## Take control with YamaTrack

If you have ever wanted to control your golf carts like Poseidon controls the seven seas, you should consider Yamaha's new GPS solution, YamaTrack.

With Yamatrack, golf course professionals can track and control the entire fleet of golf carts from an iPhone or computer. Yamaha developed this internet-based facility management software with iGolf which allows users to see exactly where each golf cart is on the course and tell if a group is falling behind in pace of play through color distinctions.

For areas in which a superintendent doesn't want carts traffic, there is a geofencing function to help implement that rule. This feature automatically sends a custom message to the intruding cart and can even control how fast the cart will accelerate until it exits. If one starts to leave the property, a geofence can be drawn that shuts down the cart entirely.

The app also has a report tool that can give the user statistics on individual carts or the entire fleet. For example, it can provide how many rounds have been played monthly and annually or how many amps an individual cart has used in a day.

PHOTOS BY: ED HISCOCK (LEFT); GRANT B. GANNON (TOP)

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## SAND-CAPPING EFFECTS ON BERMUDAGRASS FAIRWAYS

*By Wes Dyer, Ben Wherley, Ph.D., and Kevin McInnes, Ph.D.*

Growing demands for limited water resources mean that golf courses increasingly are being managed with poor-quality irrigation water. Because of this and the need for improved playing conditions, sand-capping fairways has become common in new golf course construction and renovation. Sand-capping can be particularly beneficial on sites where fine-textured soils have been irrigated with poor-quality water and elevated sodium levels have degraded physical properties of the soil and led to excessive fairway wetness, slow drainage, high runoff, poor aeration or severe compaction.

Key objectives of this 3-year project are to evaluate Tifway bermudagrass (*Cynodon dactylon* [L.] Pers. x *Cynodon transvaalensis* Burtt-Davy) root development and fairway performance as influenced by four capping depths (gradual buildup to 2 inches by topdressing and initial applications of 2, 4, and 8 inches of sand) atop two subsoils (clay loam and sandy loam). In addition, we are seeking to determine how sand-capping and subsoil combinations influence irrigation frequency requirements, root-zone soil moisture dynamics and development of subsoil sodicity over time. In the final year of the study, a 60-day summer dry-down will be imposed to evaluate turf response and recovery characteristics as influenced by sand-cap and subsoil treatments.

Research plots showing the installation of the sand cap prior to sprigging.

Results to date have shown that sand-capping depth influences sprig establishment. Plots that were not initially capped with sand (topdressed only) reached nearly full establishment after only eight weeks. However, establishment times were progressively delayed with increasing depth of the sand caps. Also, sodicity of subsoils increased sharply over a relatively short period of time due to high sodium concentration (270 ppm) in the irrigation water; However, this rate of increase was delayed by sand-capping. Interestingly, once established, levels of percent green cover in plots have been largely unaffected by capping depth or by irrigation frequencies of one or two days per week (at 60 percent of reference evapotranspiration).

USGA recommendations currently do not exist for either particle size or depth of capping sand. This study may lend insight into development of recommendations for the physical properties of capping sands and how those properties should differ from those currently used for sand in USGA-design putting greens.

*We wish to acknowledge the USGA Greens Section for support of this research.*

**Wes Dyer, M.S. candidate, Ben Wherley, Ph.D., and Kevin McInnes, Ph.D., are at Texas A&M University. Don can be reached at dwd41@tamu.edu for more information.**

PHOTO BY: WES DYER

### NEWS UPDATE

#### ASGCA FOUNDATION RELEASES 'GOLF & WATER' BOOK

A new book from the American Society of Golf Course Architects (ASGCA) Foundation, "Golf & Water: Case Studies in Water Stewardship," was introduced at the 2016 Golf Industry Show. With financial support from the Toro Foundation and Rain Bird, "Golf & Water" details more than a dozen examples from courses where ASGCA members and others from the golf industry have positively impacted the management of water.

"This book will help those who develop land – and make decisions about how golf fits into a community – see how golf is committed to good stewardship when it comes to water, our most vital natural resource," ASGCA President Steve Smyers says in a news release from the association.

"Golf & Water" provides examples of the innovative paths to responsible water stewardship being designed by ASGCA members and implemented by course owners, operators and superintendents.

Golf courses in North America have reduced water use by more than 22 percent since 2005, according to the GCSAA. "Golf & Water" shows how this has been done.

Contact Aileen Smith, Aileen@asgca.org, for print copies from the ASGCA.

//BMPs AND RECENT RESEARCH

# Lessen your anthracnose struggles

*By Brian Aynardi, John Inguagiato, Ph.D., Steve McDonald, Bruce Clarke, Ph.D., and Wakar Uddin, Ph.D.*

Anthracnose (*Colletotrichum cereale*) has been a persistent problem on putting greens, particularly in the northeastern United States, where many golf courses have *Poa annua* greens, some by choice, others to the superintendent's distain.

While anthracnose can also occur on creeping bentgrass, superintendents managing *Poa* greens know it to be nothing short of a nightmare. *Poa* greens, however, have some advantages. They produce less thatch than bentgrass, have high turf density and have the potential to provide fast green speeds.

Perhaps the biggest disadvantage: Unless superintendents follow Best Management Practices (proper nitrogen fertility, mowing, sand topdressing, irrigation, fungicides, etc.), *Poa* greens can sustain significant damage from anthracnose (Figure 1), be it basal rot or foliar blighting.

Effective anthracnose management first should include sound agronomic practices. Stress from improper management (or environmental stress) contributes to increased disease severity. Therefore, pay special attention to incorporating practices that optimize turf growth and minimize stress. Implement these practices long before weather conditions conducive for anthracnose develop and before you apply fungicides.

To combat this disease, researchers from Rutgers University, the University of Connecticut and other institutions in the NE-1046 Regional Turf Research Group have developed a set of Best Management Practices (BMPs). Research by this group has demonstrated that proper nitrogen fertility, mowing and rolling, topdressing, irrigation and the use of plant growth regulators (PGRs) are important agronomic components in managing this disease.

## NITROGEN, MOWING AND PGRs

Nitrogen (N) fertility is one of the most important tools for reducing the severity of anthracnose. Research has demonstrated that the use of quick-release, water-soluble nitrogen greatly reduces severity of this disease. The timing and frequency of N applications also has implications for reduction of anthracnose severity. For example, an application of 0.1 lbs. N/1,000 sq. ft. every seven days, as opposed to an application every 28 days, provided a 24-percent reduction in disease. A good rule of thumb is to apply 0.1 to 0.2 lbs. of soluble-N/1,000 sq. ft. every seven days during summer months (i.e., May to August) to reduce anthracnose severity. N applications every other week on the higher end of that spectrum provide a noticeable effect on disease severity as well. Apply potassium to maintain greater than 50 ppm K in the mat layer, and soil pH should be between 5.8 and 6.0 to help keep this disease in check.

Mowing is a stressful practice that reduces the photosynthetic capacity of turf. At low heights of cut (less than 0.125-inch), mowing has been shown to increase anthracnose severity. We recommend maintaining putting greens

**FIGURE 1**

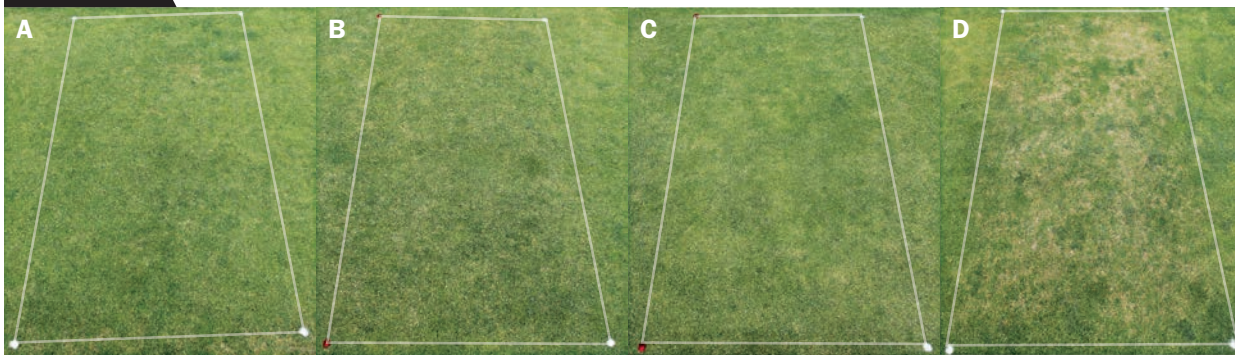
Destruction of *Poa annua* by anthracnose caused by the fungus *Colletotrichum cereale.* Untreated control plot in lower left with unaffected bentgrass filling in dead or thinned areas. Plots with treatments varying in efficacy are seen in the background.

**FIGURE 2**

Optimal control of anthracnose may be achieved through the use of tank-mixing and rotating fungicides with varying modes of action and through the implementation of Best Management Practices.

PHOTOS BY: BRIAN AYNARDI

FIGURE 3




Efficacy of Autilus 4SC (4 fl. oz./1,000 sq. ft.) + Harrell's Par (0.37 fl. oz./1,000 sq. ft.) **A**; Torque 3.6EC (0.6 fl. oz./1,000 sq. ft.) **B**; Velista 50WDG (0.50 oz./1000 sq. ft.) **C**; an untreated control (**D**) in research plots at the University of Connecticut, Storrs, Conn, in 2014 fungicide research trials.

at or above 0.125-inch to avoid predisposing turf to this disease. Moreover, data show that double-cutting and rolling greens do not intensify anthracnose and can be tools to maintain acceptable ball roll distance (green speed) when raising cutting heights.

Verticutting and topdressing were once believed to enhance anthracnose severity, however, research has demonstrated that these practices can have important agronomic value without increasing disease severity. Superintendents can use shallow verticutting to improve plant vigor, and topdressing throughout the growing season (particularly in the spring) provides a layer that protects turfgrass crowns from environmental stress, effectively raising the height of cut by firming the surface and reduces disease. However, topdressing infrequently with ultra-low rates of sand may slightly increase anthracnose if the rates used fail to build a protective layer of sand around the crowns. With this in mind, consider using a heavier topdressing program in the spring when coring and a moderate, every-other-week topdressing program in the summer to match the growth of the grass. In addition, use irrigation to replace 60 percent to 80 percent of potential evapotranspiration, along with hand watering, to avoid drought stress.

PGRs are valuable tools for reducing *Poa annua* seedheads and vertical growth. Several research studies have concluded that PGRs like Primo MAXX (trinexapac-ethyl), Embark (mefluidide) and Proxy (ethephon) do not intensify anthracnose and sometimes can reduce disease severity when applied properly to suppress seedheads in the spring and vertical growth during the summer. The beneficial effects of PGRs should be a further consideration as part of your BMPs.

## USING FUNGICIDES

BMPs for anthracnose control are not limited to cultural methods, but also include proper fungicide use. Despite your best efforts to incorporate recommended cultural practices, fungicides often are necessary to control anthracnose and maintain acceptable playing conditions.

Understanding which fungicides are most effective and when to use them has a great impact on the success of your anthracnose control program. Fungicide resistance is a real concern with anthracnose, and resistance has been demonstrated to the benzimidazole and QoI fungicides, as well as reduced sensitivity to the DMIs. Do not repeatedly apply fungicides within the same chemical class. In many cases, tank-mixing and alternating fungicides not only reduces the potential for developing resistance, but also improves disease control (Figure 2).

When resistance isn't an issue, fungicides within the following chemical classes typically provide good control of anthracnose: DMIs (FRAC Code 3, Figure 3), QoI's (FRAC Code 11), Phenylpyrroles (FRAC Code 12), Phosphonates (FRAC Code 33), Polyoxins (FRAC Code 19), and Nitriles (FRAC Code M5). Fortunately, in light of the observed cases of resistance among some existing fungicide classes, (Table 1) several new products for anthracnose management recently have come on the market. These include the succinate dehydrogenase inhibitor (SDHI) penthiopyrad (Velista; Syngenta), fluazinam (Secure; Syngenta) and the aromatic hydrocarbon PCNB (Autilus; AMVAC). These fungicides also control a wide range of other diseases.

The active ingredient penthiopyrad (FRAC Code 7) was introduced as Velista in the spring of 2015. Researchers have evaluated Velista for turfgrass disease control over the past decade. Most recently, Velista was evaluated for anthracnose control by four university and independent researchers during 2014 and 2015. At each location, Velista was applied at 0.3 oz./1000 and 0.5 oz./1,000 sq. ft. every 14 days. In 2014 and 2015, the average percent control of anthracnose among the four locations was 88 percent (Table 2, Figure 3)

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**TABLE 1**

## Fungicides Labeled for Anthracnose Control

| Class | Active Ingredients | FRAC Code | Risk for Resistance[b] |
|---|---|---|---|
| Anilines | fluazinam | 29 | Low-Medium |
| Aromatic Hydrocarbons | pentachlorobitrobenzene (PCNB) | 14 | Low |
| Benzimidazole | thiophanate-methyl | 1 | High |
| Demethylation inhibitor (DMI) | difenoconazole, metconazole, myclobutanil, propiconazole, tebuconazole, triticonazole, triadimefon | 3 | Medium |
| Dicarboximide | iprodione | 2 | Medium-High |
| Nitrile | chlorothalonil | M5 | None reported |
| Not classified | mineral oil (isoparrafin) | NC | Unknown |
| Phenylpyrrole | fludioxonil | 12 | Low-Medium |
| Phosphonate | aluminum-tris (fosetyl-al), salts of phosphorus acid | 33 | Low |
| Polyoxins | polyoxin-D | 19 | Medium |
| Succinate dehydrogenase inhibitor (SDHI) | penthiopyrad | 7 | Medium-High |
| Stobilurin (QoI) | azoxystrobin, fluoxastrobin, pyraclostrobin, trifloxystrobin | 11 | High |

[a] Selected examples of active ingredients used for the control of anthracnose. *Any mention of trade names associated with active ingredients from this list does not constitute an endorsement, nor does it imply approval to the exclusion of other suitable products.*

[b] Risk for resistance as designated by Fungicide Resistance Action Committee; FRAC Code List©2015 (http://www.frac.info/publications/downloads).

Continued from page 31

and 85 percent (Table 2), respectively. Generally, Velista alone has provided good-to-excellent anthracnose control at the 0.5 oz./1,000 sq. ft. (Figure 3), or when applied at 0.3 oz./1000 sq. ft. as a tank-mixture with a reduced rate of another effective anthracnose fungicide.

### REEVALUATING AN OLDER COMPOUND

Fluxapyroxad and isofetamid, recently released and marketed as Xzemplar (BASF) and Kabuto (PBI-Gordon), are also SDHI fungicides, however, they are not labeled for anthracnose control and have not been efficacious against this disease in field research trials. At the same time university researchers were evaluating the effect of these SDHI fungicides for the control of anthracnose, they re-evaluated an older compound, PCNB (FRAC Code 14), to see if it could suppress this disease without causing chlorosis or necrosis during hot weather.

Researchers at Penn State University first evaluated the active ingredient PCNB for the control of anthracnose in the summer of 2013. In 2014 and 2015, PCNB was evaluated in field trials in multiple locations to test its efficacy against anthracnose and its potential for causing phytotoxicity.

Researchers at four locations in the Northeast (Rutgers University, the University of Connecticut and the independent contracting company, Turfgrass Disease Solutions [Pennsylvania]) applied PCNB as a stand-alone fungicide, as well as in rotation programs. On average, it provided greater than 95 percent control of anthracnose across all of the trials when applied at 8.0 fl. oz./1000 sq. ft. in 2014 (Table 2), and 90 percent control at 6.0 fl. oz./1000 sq. ft. in 2015 (Table 3).

This product recently has been launched under the trade name Autilus, with a recommended application rate of 6.0 fl. oz./1000 sq. ft. (Figure 3). During hot weather, PCNB can cause chlorosis or necrosis of creeping bentgrass, and therefore, the label indicates that superintendents should apply Autilus only in the spring and fall months during cool weather (when air temperatures are not predicted to be above 85°F), and that it be mixed with a pigmented product (e.g., Par, Foursome, GreenPig, etc.) to avoid any potential discoloration of the turf. Tank-mixing with pigmented fungicides such as Appear or any of the StressGard formulations (Bayer) (e.g., Mirage, Signature Xtra or Fiata) can enhance disease control and prevent discoloration. A pre-mix product of PCNB and tebuconazole (Oreon, AMVAC), which was due to be released in February, also was evaluated for anthracnose control at the four locations. The addition of tebuconazole with PCNB in the pre-mix improved anthracnose control (to greater than 98 percent) compared to PCNB alone at all pre-mix application rates (4.0, 6.0,

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**TABLE 2**

## Data from four trials conducted in 2014 showing efficacy of active ingredients penthiopyrad and PCNB in controlling anthracnose

| Active Ingredient | FRAC Group | fl. oz. product/ 1,000 sq. ft. | Pennsylvania[z] | | | | New Jersey[y] | | | | Pennsylvania[x] | | | | Connecticut[w] | | | | Average Percent Control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 28-Jul-14 | | 11-Aug-14 | | 16-Aug-14 | | 26-Aug-14 | | 03-Sep-14 | | 10-Sep-14 | | 01-Aug-14 | | 15-Aug-14 | | |
| | | | %Disease | % Control | %Disease | % Control | %Disease | % Control | %Disease | % Control | %Disease | % Control | %Disease | % Control | %Disease | % Control | %Disease | % Control | |
| PCNB[u] | 14 | 4.0 fl. oz. | 0.5 c | 97.8 | 0.5 b | 98.0 | 15.3 d | 78.1 | 10.3 c | 84.6 | 0.0 c | 100.0 | 0.8 de | 81.4 | 0.1 ef | 99.9 | 5.5 cde | 91.2 | 91.4 |
| PCNB[u] | 14 | 8.0 fl. oz. | 0.0 c | 100.0 | 0.0 b | 100.0 | 4.5 fg | 93.6 | 3.3 ed | 95.1 | 0.3 bc | 90.9 | 0.5 de | 88.4 | 0.3 c-f | 99.6 | 1.2 c-g | 98.1 | 95.7 |
| tebuconazole[t] | 3 | 0.6 fl. oz. | 0.0 c | 100.0 | 0.0 b | 100.0 | 5.3 e-g | 92.4 | 5.5 c-e | 91.8 | 3.5 ab | 0.0 | 3.8 a-d | 11.6 | 0.1 ef | 99.9 | 0.1 fg | 99.8 | 74.4 |
| penthiopyrad[s] | 7 | 0.3 oz. | 0.0 c | 100.0 | 0.0 b | 100.0 | 10.3 de | 85.2 | 9.3 cd | 86.1 | 0.5 abc | 84.8 | 0.3 e | 93.0 | 10.7 b | 86.0 | 18.6 b | 70.1 | 88.2 |
| azoxystrobin[r] | 11 | 1.0 oz. | 6.0 b | 73.1 | 3.5 b | 85.7 | 53.3 b | 23.6 | 67.3 a | 0.0 | 3.8 a | 0.0 | 2.8 a-e | 34.9 | 76.5 a | 0.0 | 55.1 a | 11.4 | 28.6 |
| UTC | | – | 22.3 a | – | 24.5 a | – | 69.8 a | – | 67.0 a | – | 3.3 abc | – | 4.3 abc | – | 76.2 a | – | 62.2 a | – | – |

[z] Trial conducted in Pottstown, Pa., by Steve McDonald, Turfgrass Disease Solutions. Percent anthracnose means followed by the same letter are not significantly different (p=0.05; Tukey's HSD).

[y] Trial conducted in New Brunswick, N.J., by Bruce Clarke, Ph.D., Rutgers University. Percent anthracnose means followed by the same letter are not significantly different (p=0.05; Waller-Duncan k-ratio t-test (k=100)).

[x] Trial conducted in University Park, Pa., by Brian Aynardi and Wakar Uddin, Ph.D., Penn State University. Percent anthracnose means followed by the same letter are not significantly different (p=0.05; Tukey's HSD).

[w] Trial conducted in Storrs, Conn., by John Inguagiato, Ph.D., University of Connecticut. Percent anthracnose means followed by the same letter are not significantly different (p=0.05; LSD).

[v] Treatments that included PCNB were tank-mixed with the pigment product Par at 0.37 fl. oz./1,000 sq. ft.

[u] Applied as Autilus 4SC

[t] Applied as Torque 3.6F

[s] Applied as Velista 50WDG

[r] Applied as Heritage 50WDG

**TABLE 3**

## Data from four trials conducted in 2015 showing efficacy of active ingredients penthiopyrad and PCNB in controlling anthracnose

| Active Ingredient | FRAC Group | fl. oz. product/ 1,000 sq. ft. | Pennsylvania[z] 13-Jul-15 %Disease | | Pennsylvania[z] 13-Jul-15 % Control | Pennsylvania[z] 22-Jul-15 %Disease | | Pennsylvania[z] 22-Jul-15 % Control | New Jersey[y] 08-Aug-15 %Disease | | New Jersey[y] 08-Aug-15 % Control | New Jersey[y] 18-Aug-15 %Disease | | New Jersey[y] 18-Aug-15 % Control | Pennsylvania[x] 31-Jul-15 %Disease | | Pennsylvania[x] 31-Jul-15 % Control | Pennsylvania[x] 11-Aug-15 %Disease | | Pennsylvania[x] 11-Aug-15 % Control | Connecticut[w] 30-Jul-15 %Disease | | Connecticut[w] 30-Jul-15 % Control | Connecticut[w] 07-Aug-15 %Disease | | Connecticut[w] 07-Aug-15 % Control | Average Percent Control |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCNB[v,u] | 14 | 6 fl. oz. | 0.0 | b | 100.0 | 0.0 | b | 100.0 | 29.0 | b | 68.3 | 24.3 | b | 74.1 | 7.5 | efg | 90.8 | 11.3 | h-k | 85.4 | 0.0 | f | 100.0 | 0.5 | e | 99.2 | 90.0 |
| PCNB[v,t] tebuconazole | 14 3 | 4.0 fl. oz. | 0.0 | b | 100.0 | 0.0 | b | 100.0 | 5.0 | cd | 94.5 | 2.5 | c | 97.3 | 2.5 | g | 96.9 | 2.5 | jk | 96.8 | 0.0 | f | 100.0 | 0.3 | e | 99.6 | 98.1 |
| PCNB[v,t] tebuconazole | 14 3 | 6 fl. oz. | 0.0 | b | 100.0 | 0.0 | b | 100.0 | 2.8 | cd | 96.9 | 2.8 | c | 97.0 | 0.0 | g | 100.0 | 0.0 | k | 100.0 | 0.8 | ef | 98.4 | 0.5 | e | 99.2 | 98.9 |
| PCNB[v,t] tebuconazole | 14 3 | 8 fl. oz. | 0.0 | b | 100.0 | 0.0 | b | 100.0 | 0.3 | d | 99.7 | 1.3 | c | 98.6 | 2.5 | g | 96.9 | 7.5 | ijk | 90.3 | 0.2 | f | 99.6 | 0.3 | e | 99.6 | 98.1 |
| tebuconazole[s] | 3 | 0.6 fl. oz. | 0.0 | b | 100.0 | 0.0 | b | 100.0 | 8.5 | c | 90.7 | 6.0 | c | 93.6 | 25.0 | c-g | 69.2 | 25.0 | e-j | 67.7 | 7.9 | d | 85.1 | 18.5 | d | 72.1 | 84.8 |
| penthiopyrad[r] | 7 | 0.5 oz. | 0.0 | b | 100.0 | 0.0 | b | 100.0 | 9.5 | c | 89.6 | 3.8 | c | 95.9 | 25.0 | c-g | 69.2 | 22.5 | f-k | 71.0 | 7.5 | d | 85.9 | 18.8 | d | 71.7 | 85.4 |
| UTC | | – | 17.5 | a | – | 19.3 | a | – | 91.5 | a | – | 93.8 | a | – | 81.3 | a | – | 77.5 | a | – | 53.3 | f | – | 66.3 | b | – | – |

[z] Trial conducted in Pottstown, Pa., by Steve McDonald, Turfgrass Disease Solutions. Percent turf symptomatic with anthracnose means followed by the same letter are not significantly different (p=0.05; Tukey's HSD).

[y] Trial conducted in New Brunswick, N.J., by Bruce Clarke, Ph.D., Rutgers University. Percent turf symptomatic with anthracnose followed by the same letter are not significantly different [p=0.05; Waller-Duncan k-ratio t-test (k=100)].

[x] Trial conducted in University Park, Pa., by Brian Aynardi and Wakar Uddin, Ph.D., Penn State University. Percent turf symptomatic with anthracnose means followed by the same letter are not significantly different (p=0.05; Tukey's HSD).

[w] Trial conducted in Storrs, Conn., by John Inguagiato, Ph.D., University, Connecticut. Percent turf symptomatic with anthracnose means followed by the same letter are not significantly different (p=0.05; LSD).

[v] Treatments that included PCNB were tank-mixed with the pigment product Par at 0.37 fl. oz./1,000 sq. ft.

[u] Applied as Autilus 4SC

[t] Applied as Oreon 4SC (4.0 lb. a.i./gal of PCNB and 0.2 lb. a.i./A tebuconazole)

[s] Trade formulation applied as Torque 3.6F

[r] Trade formulation applied as Velista 50WDG

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and 8.0 fl. oz./1,000 sq. ft.) tested (Table 3). This improved efficacy with the pre-mix is supported by other studies that have found in general that tank mixes or pre-mixtures of formulated fungicides tend to provide improved anthracnose control compared to active ingredients applied alone.

Tank-mixing fungicides with different modes of action is an important management practice, particularly when controlling pathogens such as *Colletotrichum cereale* that have demonstrated resistance to fungicides. There currently are a number of pre-mixed products in addition to the previously mentioned materials labeled for the control of anthracnose (e.g., Briskway [Syngenta], Fame C [FMC], Fame T [FMC], Enclave [Quali-PRO], Headway [Syngenta], Interface Stressgard [Bayer] and Tartan Stressgard [Bayer]). All of these products control anthracnose, though efficacy may vary depending on differences in environmental conditions, management practices and the potential for fungicide-resistant strains of the pathogen present in certain sites.

Although penthiopyrad and PCNB have been shown to work well when tested as stand-alone products for the control of anthracnose, these products, like all fungicides, *should never be applied repeatedly for the control of any disease.* A proper rotation or tank-mixing program with fungicides of different modes of action (see Table 1) always is the best option to enhance disease control while reducing the potential for fungicide resistance. An attribute of PCNB as part of an anthracnose program is its low risk for fungicide resistance. Incorporation of active ingredients with a low potential for resistance into a spray program may benefit superintendents who have struggled with a loss in efficacy due to fungicide resistance.

Regardless of the fungicide choice, always make sure you're using solid agronomic practices from the start. The BMP cultural practices described in this article have been shown to reduce the number of fungicide applications required to control anthracnose and provide acceptable turf quality.

Also, don't be afraid to add a small amount of nitrogen to your spray tank (0.1 to 0.2 lbs. N/1,000 sq. ft.) when anthracnose is present, as well as raise the height of cut and double cut and/or roll to maintain ball-roll distance, irrigate and syringe to avoid drought stress, topdress to maintain a canopy full of sand to match the growth of the grass and use PGRs to suppress seedheads and vegetative growth on putting greens. It's your job as a superintendent to explain why the incorporation of BMPs are vital to providing the best putting surface possible. Fungicides should be part of the answer, but they are not the sole answer

to effectively combating anthracnose.

When planning your anthracnose spray program for the upcoming season, make sure you're rotating modes of action as well as combining products into a single spray. It's also suggested that you become a researcher on your own. Try evaluating different fungicide rotations and incorporate the new modes of action into your program. You won't only be reducing the likelihood of developing resistance; You may enhance disease control and like what you see.

*Any mention of trade names associated with active ingredients in this article does not constitute an endorsement, nor does it imply approval to the exclusion of other suitable products by the authors.*

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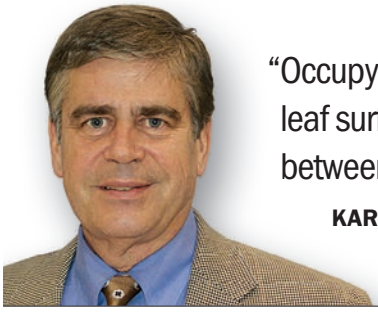

"Occupying less than 1 percent of the leaf surface, stomata are gatekeepers between resources a plant needs."

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

# The gatekeepers

Stomata are simple structures defined as a pore and accompanying guard cells. Occupying less than 1 percent of the leaf surface, stomata are gatekeepers between resources a plant needs, like air, water and light, and regulate the release of some of those same resources and byproducts. Stomata impact photosynthesis, respiration and stress (temperature and moisture). But behind their physical mask of simplicity lay the plant's complex workings.

Stomata arose some 400 million years ago. However, stomata density has changed in response to atmospheric levels of carbon dioxide ($CO_2$). When Earth's atmosphere was high in $CO_2$ the stomata density of plants was low. But as atmospheric levels decreased stomata density rose.

Stomata on turfgrass plants respond to light, opening with sunrise and closing at sunset. Stomata open to allow $CO_2$ to enter the leaf. The $CO_2$ is fixed in the mesophyll cells by an enzyme (known as rubisco) to a five-carbon compound (ribulose-1,5-bisphosphate) as part of the photosynthetic reaction. The important thing to remember is the enzyme that fixes $CO_2$ needs a lot of $CO_2$. Thus the stomata need to be wide open. The downside to wide open stomata is increased water loss (transpiration).

So stomata of cool-season turfgrasses have decisions to make. The plant needs to capture and store energy via photosynthesis, however, excessive water loss through transpiration can result in plant injury or death. None of the options are ideal, but the turfgrass plant often will close stomata to reduce moisture loss. One result is that the turf's temperature rises due to lack of transpirational cooling.

Another is that the plant's photosynthetic efficiency tanks. When the stomata close, $CO_2$ levels drop and oxygen ($O_2$) levels increase (byproduct of photosynthesis). This imbalance in $CO_2$/$O_2$ results in an efficiency decrease because oxygen is now being fixed by our enzyme (rubisco) to that five-carbon compound instead of carbon dioxide. This is called photorespiration.

An analogy is a 427 eight-cylinder big block engine I would like to put into my '69 Firebird (see December's *Golfdom*). When the right fuel mixture is being provided (in this case a high $CO_2$:$O_2$ ratio), the engine is firing on all eight cylinders. However, when the stomata close, our eight-cylinder engine is now firing on only four cylinders because the fuel mixture has changed to a higher $O_2$ ratio. Staying with my car engine analogy, high temperatures exasperate the problem by making oxygen more soluble, causing even a greater degree of engine misfires. Photorespiration occurs under summertime conditions.

What does this mean for warm-season turfgrasses? Warm-season turfgrasses have an additional process called the C4 pathway, where an enzyme called Phosphoenolpyruvate carboxylase has a high affinity for carbon dioxide, which brings it through a series of processes to the five-carbon compound mentioned previously. This process, however, requires *a lot* of energy in the form of radiant (light) energy.

This process is valuable during periods of limited water and high light intensities. Due to the ability to fix $CO_2$, warm-season turfgrasses function with a narrower stomata during periods of high transpiration (allowing for lower water loss) and do not undergo photorespiration.

We can observe the impact of photorespiration visually on a golf course with a bermudagrass fairway and/or approach that abuts a creeping bentgrass green. In summer, with high temperatures, high light intensities and high transpiration rates, creeping bentgrass is at least 50 percent less competitive than bermudagrass due to photorespiration alone. The result is often bermudagrass encroaching into the creeping bentgrass. Conversely, if the conditions are much cooler, with cloudy, wet weather, we see the reverse.

This speaks broadly to the difficulty in predicting a turf outcome for all situations involving the manipulation of stomata. How pigments, antitranspirants or surfactants impact plant responses by affecting stomata behavior is complex. Too many factors — climate, weather, soil and turfgrass species — make simple predictions difficult.

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

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# Grabbing my attention in San Diego

What caught your attention at the recent Golf Industry Show in San Diego? I hope you were able to attend the GIS and take advantage of the education offerings, trade show, networking and the city of San Diego. My time was spent on the trade show floor, networking and exploring a little of San Diego before the trade show started. Here is what caught my attention.

The products and services on the trade show floor are a sight to behold. I am amazed by the wide variety of products for sale, and they remind me of the diverse skills that superintendents must possess in order to get their jobs done. However, many tasks that are a superintendent's responsibility are not represented at the trade show, tasks like carpentry, electrical work, plumbing, swimming pool maintenance and many others.

I was struck by what seemed to be a large number of products targeting sand bunker maintenance, including a number of companies offering bunker liners for sale. All those things having to do with bunkers tell me that golf courses are spending a considerable amount of time and money maintaining sand bunkers.

If the golf industry is serious about reducing the cost of golf and the cost of maintaining golf courses, perhaps it needs to focus its attention on reducing the number of sand bunkers on golf courses. Sand bunkers are part of the history of golf and should be part of the future of golf. But it's time to carefully evaluate how many bunkers are really needed on a golf course, as well as the size and shape of each bunker, with an eye to reducing maintenance costs.

**"I am amazed by the wide variety of products for sale, and they remind me of the diverse skills that superintendents must possess in order to get their jobs done. However, many tasks that are a superintendent's responsibility are not represented at the trade show..."**

As long as I'm discussing bunker maintenance, has anyone come up with a method to reduce the time spent edging bunkers? Time spent in this endeavor always seems to surface in conversation with superintendents as an expensive task that they would like to minimize. Share your ideas with me, and I'll share them with *Golfdom* readers.

## IRRIGATION PRODUCTS, TOO

Like sand bunker products, there was an array of irrigation-related products on display in San Diego. There's no question that irrigation systems and all that it takes to keep them functioning are vital to the success of a golf course. But again, if the golf industry is serious about conserving water and reducing maintenance costs, it's time to seriously evaluate how much irrigated turf is necessary on a golf course.

There is nothing like reducing the number of irrigation heads on a golf course to save money and conserve water. Admittedly, this is a difficult step and will take an adjustment by golfers and superintendents to learn to appreciate turf that is less than vibrant green. While cutting back on the amount of water we are applying to turf is helpful and a step in the right direction, major water savings and dollar savings will come by reducing the amount of irrigated turf.

## WHERE ARE THE STUDENTS?

The university professors I talked to during the GIS all mentioned as a pressing problem the declining enrollment of students majoring in turf. Enrollment drives many aspects of a university, including the number of professors hired to teach and conduct research in a specific discipline like turfgrass science. There is a direct connection between the number of turf students and the number of turfgrass faculty members. If turf student enrollment remains low, it will be difficult as current turf faculty retire for universities to fill vacant turf positions with new faculty members.

On a more positive note, San Diego is a great place to hold the GIS. And in keeping with the theme of reducing expenses, has the time come to attend GIS every other year?

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

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**Golfdom**

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# The 19th Hole

## Kevin Hicks

**SUPERINTENDENT** // Coeur d'Alene (Idaho) Resort

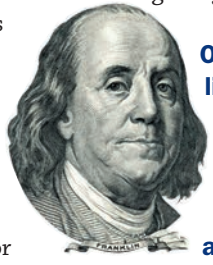
**What can I get you?** Any beer I can't see through.

**Are you married, kids?** I'm married, 23 years (Julie). We have three boys, ages 18, 16 and 10.

**What are your teams?** Gonzaga basketball, the local team. And I'm a big golf nut.

**What about your oldest son's baseball team?** Michael plays for Yavapai College in Prescott, Ariz. They're good. He's a freshman, just getting started, he plays a lot of designated hitter. He graduated high school on a Friday, then got drafted by the Yankees the following Wednesday. He wisely decided to go to college for a few years. He's 6'7" 260, a power hitter. We'll see what happens.

**If you were to write a book, what would the title be?** I'm in the process — I'm actually writing it. I ran a course in Boise that hosted the Boise Open, a Nationwide Tour event. There was a term one of the tournament set-up team guys used all the time, because his life was always in turmoil… he called his life "Asininity: The Art of Being Asinine." That's what my book is going to be called. It's a compilation of ridiculous experiences I've had with people, owners, members and employees. I'll have to be unemployed or retired when I finish it. But I've been writing it for 25 years.



**March is almost here, what's your biggest concern?** Getting the course ready. We regrassed greens last fall, we need to be ready for April 15th. Being a resort, we try to give the same experience to the April 15th golfer as we do the July 15th golfer. We had a great winter, we're getting there.

**One person in history you'd like to meet?** I like political history, so I think Ben Franklin.

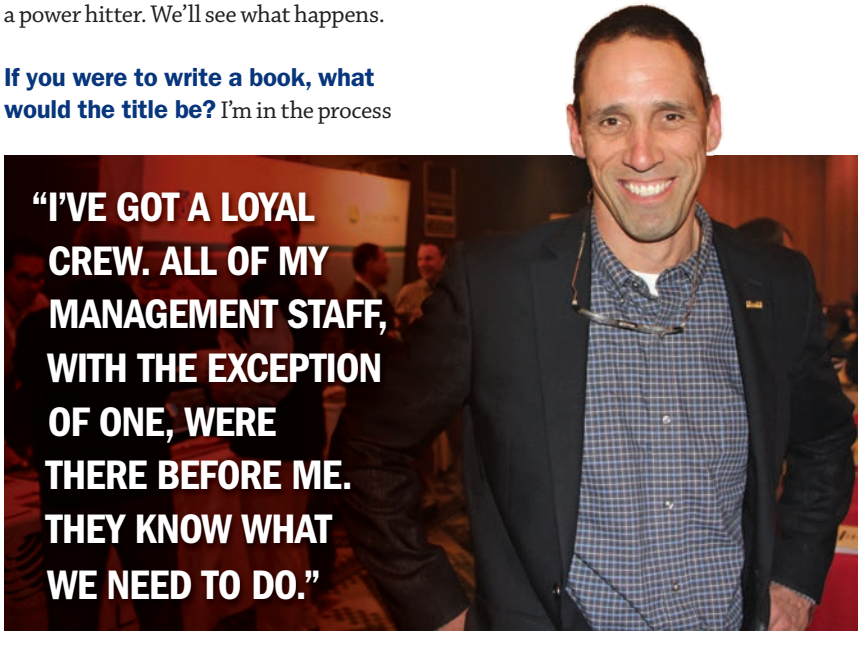
**Do you have any tools in the shop you want to brag about?** My equipment tech, Dave Woodall, he's the best asset in our company. Every year he tries to raise the bar. He bought a pipe bender, called a JD Squared. But it's not just a pipe bender, he's building frames for trailers and such. It's opened a whole new horizon… for instance he built from scratch, a new frame for our GPS sprayer… superintendents would be drooling over this thing.

**Last good movie you saw?** The new Star Wars.

**Favorite thing about living in Idaho?** Good people. And the outdoor opportunities are unbelievable. We have a sailboat, great golf weather, and I'm outside at a lot of baseball games.

**If you won the lottery, what kind of car would you buy?** Corvette Stingray.

**How tall are you? Would you fit?** I'm 6'5. I'll make sure I do.




As interviewed by Seth Jones, Feb. 24, 2016.

MAIN PHOTO BY: SETH JONES

# Top 3 things you could be doing while on the green.

## Unless you just want to measure moisture.

## Your call.

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