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# Golfdom

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## THE SKY IS THE LIMIT

DRONES, DATA AND TURF MAINTENANCE

AUTONOMOUS ROBOT MOWERS

NEFF SUMMARIZES SOCIAL MEDIA

WINTER DISEASES  
OF BERMUDAGRASS GREENS

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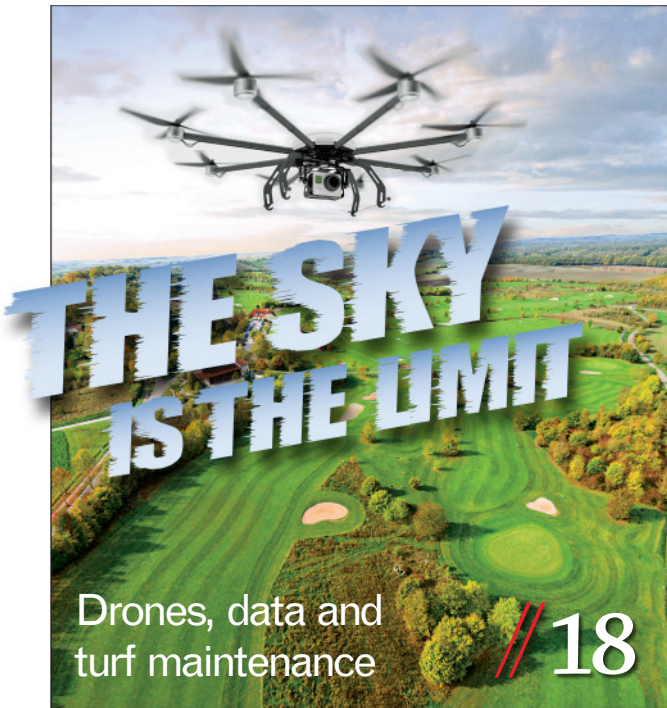


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“...all that back-to-back travel meant some good stories died in my notebook. Maybe I can resuscitate some of them here.”

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

# The summer of '16

**T**he PGA Championship in July threw me for a loop. I enjoyed golf in the Olympics as much as the next guy (thank you, Matt Kuchar), but what I did not enjoy was golf's four majors going by in what felt like the blink of an eye. It made my summer go by equally fast.

It was around the PGA Championship that I realized I had been in seven major cities over seven days. I saw a lot of golf, met a lot of people and maybe even learned a few things. But all that back-to-back travel meant some good stories died in my notebook. Maybe I can resuscitate some of them here.

My PGA Championship week started off with a trip to Milwaukee to play Erin Hills, host course of the 2017 U.S. Open. Jason Straka of Fry/Straka Design invited me out. We were joined by current ASGCA President Greg Martin of Chicago-based Martin Design. It was fun listening to Straka, who was part of

the design team (along with Michael Hurdzan, Dana Fry and Ron Whitten), talk about the course. Also great to bend Martin's ear on the state of the game. He's bullish on the industry.

Despite the shape of my golf shot that day, Erin Hills probably will go down as my most enjoyable round of the year. Great views, great company and a course that is as rewarding as it is challenging.

I got out to the PGA Championship mid-week, and of course Mark Kuhns and his team had Baltusrol looking phenomenal. I took time to watch some golf with my friends from the Plant Food Co., where we followed Tom

Weinert's bold lead and accessed the VIP area of No. 4 green. I like Tom's style.

And if you know me, you know I have to mention the PGA Championship social hour that Kuhns and the GCSA of New Jersey put on in the volunteer tent. I reconnected with a lot of people and made some new friends. Check out *Golfdom* Gallery for photos from that event.

While in New Jersey I took the time to catch a train to Manhattan to meet up with one of my mentors, Joe Yanarella, editor-in-chief of *Bleacher Report*. It was great to catch up with Joe, who I hadn't seen in a few years. What he's done with *Bleacher*

*Report*, which averages some 37 million readers a month, is remarkable. He was de-servingly named *AdWeek's* "Digital Editor of the Year" in 2015, and I hope I picked up a few tips from my old boss.

Next was the most arduous stretch of the trips, thanks to the airline losing my golf clubs. I eventually made my way to Graniteville, S.C., to meet the kind folks at Textron Specialized Vehicles at beautiful Sage Valley. They schooled me on everything involved in the development of the new Cushman Hauler. For a report, check out page 46.

All the flights, combined with playing with short sticks at Sage, wrecked my back. I'm on a first-name basis with my chiropractor again. (But hey, my clubs arrived just in time to schlep them back to the airport.)

I couldn't take too long to recover because the next week held a trip to Dallas, where I toured Trinity Forest. My friend Kasey Kauff is superintendent there. The former landfill is the future host of the AT&T Byron Nelson. It's obviously an interesting course. I posted a video on **Golfdom.com** if you'd like to see it and hear from Kasey.

Now I'm back home, ready to enjoy a few weeks of downtime. My mother-in-law bought me a new smoker, just in time for football season. Even though the summer of '16 went by far too fast, the fall of '16 could be just as much fun.

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# Starter

NEWS, NOTES AND QUOTES



Paul R. Latshaw, pictured with John Zimmers at the 2013 U.S. Open, was named the 2017 Old Tom Morris Award winner.

## // LAUDING LATSHAW



## GCSAA NAMES LATSHAW 2017 OTM AWARD WINNER

➔ Paul R. Latshaw, who prepared golf courses for nine major championships over 38 years as a superintendent and elevated the profession through his influence and innovation, will be the recipient of the 2017 Old Tom Morris Award from the Golf Course Superintendents Association of America.

"I am dumbfounded, and I still can't get over the fact that I am getting this award," the 75-year-old Latshaw told GCSAA in a statement. "The first thing I thought of was that Nicklaus and Palmer had won this award. Wow!"

The award has been presented annually by GCSAA since 1983 to an individual who, through a lifetime commitment to the game of golf, has helped to mold the welfare of the game in a manner and style exemplified by Old Tom Morris. Latshaw is only the fourth

superintendent to be honored with the award, joining Sherwood Moore (1990), Walter Woods (2002) and GCSAA founder Col. John Morley (2009).

During his long career, Latshaw worked at Oakmont; Augusta National Golf Club in Augusta, Ga.; Wilmington (Del.) Country Club; Congressional Country Club in Bethesda, Md.; Riviera Country Club in Pacific Palisades, Calif.; and Winged Foot Golf Club in Mamaroneck, N.Y.

Some of his innovations included rolling greens for firmness, using fans to deliver air circulation and cool greens in the summer, cutting fairway approach areas with walking mowers and recruiting volunteers to help with the workload at major championships.

Latshaw will receive the award Feb. 7 at the Opening Session of the Golf Industry Show in Orlando.

## // THE GUYS IN GREEN

### DEERE EXTENDS FIRST TEE COMMITMENT

John Deere announced recently it would extend through 2021 its commitment to The First Tee, the non-profit youth development organization that uses golf to teach skills to young people.

Deere's support will focus on community service and volunteerism, leadership skills for girls and program support of The First Tee activities in select Deere communities.

"Over the next five years, this initiative will encourage and recognize young people who take an active role in preparing for their future and serve the communities where they live," said Mara Downing, president of the John Deere Foundation and director of corporate citizenship and global brand management at Deere & Co.

The John Deere Foundation also will provide funding to develop The First Tee chapters in select John Deere home communities.

## // PASSING NOTED

### ARCHITECT BOB CUPP PASSES AT AGE 76

Bob Cupp, a past president and Fellow of the American Society of Golf Course Architects (ASGCA), died Aug. 19, 2016. He was 76.

After a brief career as a professional golfer, Cupp began designing courses. He worked with Jack Nicklaus, ASGCA Fellow, as a senior designer for more than 15 years before forming his own firm. His courses have hosted more than 50 national and international championships. His work over the years included joint projects with his son Bobby, a golf course architect and builder.

"Bob Cupp was a Renaissance man," said ASGCA President Greg Martin. "He was a poet and author, golf course architect and musician, he loved to tell tales and offer opinions. As a member and as ASGCA president, he provided lyrical perspective during some deeply challenging years."



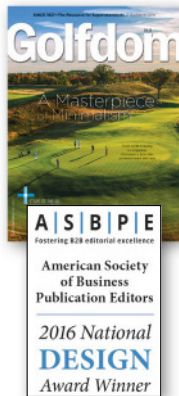
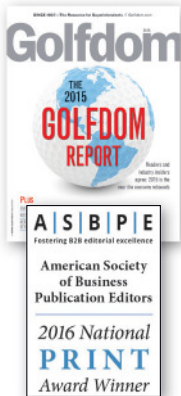
Bob Cupp

## // ACCEPTANCE SPEECH

# Golfdom lands national awards

➔ More accolades for your favorite magazine in the industry — making our moms and North Coast Media proud.

*Golfdom* won two awards from the American Society of Business Publications Editors, a bronze award for original research for the 2016 *Golfdom* Report, and another bronze award for the front cover photo of the April 2015 cover story featuring Erin Hills Golf Course.



“All of us at North Coast Media take great pride in our products,” said Kevin Stoltman, NCM president and CEO. “We continually look at ways to improve the design and content of our magazines, newsletters and digital media and to increase reader engagement. Receiving these awards is a great honor and supports these goals.”

*Golfdom* editorial staffers Seth Jones,

Pete Seltzer and Grant B. Gannon were unavailable for comment as of press time, as the three were busy celebrating at Cleveland’s Flannery’s Pub.

## // I WANT MY GOLFDOM TV

# GOLFDOM TV VISITS TRINITY FOREST

Trinity Forest Golf Club in Dallas is a Coore/Crenshaw design set to open for play next month. In advance of the grand opening, *Golfdom* TV toured the course and spoke with course Superintendent Kasey Kauff about the links-style course, the unique vegetation in the rough and the site’s origins as a landfill. To view the interview, visit [golfdom.com/category/video/](http://golfdom.com/category/video/).



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**A**lthough the Des Moines (Iowa) Golf and Country Club's membership was established in 1897, the location of the club has been known to drift. The club moved locations in 1903, 1921 and finally to its current home in 1968.

The initial golf course at Des Moines G&CC was designed by Pete Dye in 1966, one of his earliest. What started as one 18-hole course was expanded to 36 holes by Dye. Instead of constructing a new course the property was split and nine holes were built on each side of the property. There's a North Course that contains nine original holes and nine from the update and the South Course has the other original nine and a separate additional nine.

On most days this par-3 is No. 12 on the North Course and plays 160 yards to 194 yards, depending if the pin is in the front or back of the horseshoe-shaped green. When it comes time to host a championship, like the 1999 U.S. Senior Open or the upcoming 2017 Solheim Cup, the course reverts to the original 18 holes, and this hole becomes No. 3.

To keep his course looking beautiful year-round Des Moines G&CC Director of Grounds Rick Tegtmeier says he uses Syngenta's Daconil Action, and a lot of it.

"It's the backbone of my agronomic plan," says Tegtmeier. "I use as much as the law allows."

One problem that Tegtmeier says he can face are grubs and cutworms, but the Des Moines G&CC's director of grounds since 2006 has a Syngenta-provided solution for those pests. He uses Acelepryn insecticide "wall-to-wall" on his roughs and fairways.

"What I like about it is that I can make applications at the end of May or June 1, and it gives me season-long control," says Tegtmeier. "It's a little bit more expensive to use, but the benefit is that it controls a bunch of different insects and grubs all season long."



**Rick Tegtmeier**  
CGCS MG

# Hole

# Hole No. 12

## Des Moines Golf and Country Club

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“...since at least 75 percent of turf-related social media posts fall into one of the following categories, I’m confident that this summary will be completely accurate.”

**MATT NEFF**, *assistant superintendent, Wedgewood G&CC, Powell, Ohio*

## ICYMI

If you haven’t heard, social media is huge, and it’s no surprise that it’s caught on like wildfire in our industry. After all, the only people who truly understand what we do are our grass-growing brethren, so it makes perfect sense that sharing our thoughts, issues and opinions with others in the business would be wildly appealing to many. Add to that the visual nature of our work and the ease with which photos and videos can be shared, and it’s a match made in heaven.

Unfortunately, we get so busy this time of year that we usually don’t have a lot of time to keep up with everything that’s going on in the Twittersphere (a word I hoped I’d never use) or any of the other social media outlets. Because *Golfdom* is entirely committed to our readers, I will attempt to get you caught up on what you may have missed so far this year.

Keep in mind that I, too, have had almost no time to keep up with the latest social media goings-on, but since at least 75 percent of turf-related social media posts fall into one of the following categories, I’m confident that this summary will be completely accurate.

### The Hopeless Romantic Post

Several people posted pics of sunrises and glistening dew with captions ranging from “Best office on earth!” to “Nothing like the smell of fresh-cut grass in the morning.” I’m admittedly a huge sucker for these; I’ll throw a “like” at an HRP almost every time.

### The Maintenance Monday Post

A lot of crews used Mondays to backtrack verti-cut in multiple directions, Graden, needle tine, deep tine, Dry-Ject, topdress or spray greens. There may have been a few where most of this was done in the same day. I hope they’re on bermuda. I bet guys who aren’t fortunate enough to ever have a free Monday get tired of reading these.

### The Zippity-Doo-Dah Post

For some guys out there, the sun is always shining, the crew is always awesome and the turf is always #glowing. The cynic in me sometimes wonders if these are just marketing ploys to get more interns.

### The New Equipment Delivery Post

It was Christmas in (insert month that’s not December) for several crews. We’re like a bunch of kids when it comes to new equipment. We can’t wait to use it, and when somebody else gets new stuff we wish we were getting some, too. Speaking of marketing ploys...

### The Carnage Post

Unfortunately, people apparently had to deal with vandalism, storm damage, divots

on greens, spray rigs in lakes, irrigation geysers... basically everything that keeps you awake at night and makes you feel bad for the guy posting it.

### The Weather Post

It rained a lot somewhere, didn’t rain for weeks somewhere else, and was really hot or not that hot. Misery (and relief) love company. This is one of the best things about social media usage in our business. We all know we’re not the only ones dealing with a certain set of challenging circumstances, but it sometimes helps to be reminded that you’re not alone.

### The Soapbox Post

Somebody took exception to something someone else posted and decided they needed to air their objections publicly. All I’ll say about this is that being preachy and self-righteous is never a good look. Oops — I guess I just was. Carry on, soapboxers, my apologies. You were just getting ready to light me up, weren’t you?

I hope that helped get everybody caught up. I’d hate for you to have to spend all winter wading through thousands of posts when everybody knows winter is for reading the April through November issues of all the trade magazines. Merry Christmas. Hope you don’t have to spend all weekend plowing snow.

Matt Neff ([mneff4@yahoo.com](mailto:mneff4@yahoo.com)) is assistant superintendent at Wedgewood G&CC in Powell, Ohio.



# Seeing the savings

It was one of the hottest and driest summers that Matthew Stout has ever had to face in his 11-year career as a superintendent. It's also his first at LuLu Country Club, Glenside, Pa., where Stout says the course saw temperatures hit 90 or more on 44 days this summer.

With the help of BASF's products LuLu CC has held up to the heat. The membership is telling its superintendent that they have never seen the course look like this at this point of the year.

"They are just comparing it to the last three to five years," Stout says of the Donald Ross-designed course that a year ago had a fairway that was half dirt and half crabgrass. "The course has some bumps and bruises from the lack of rain, but compared to some of the other courses in the area we are doing well. When you don't see a lick of fungus or disease you know the products are working."

This summer Stout has made three applications of BASF's Xzemplar fungicides on his fairways for 21 days of control. The **Elite Rejuvenation** spray program that he started in April has one final application of Emerald this month.

Over at Oglebay Resort, Wheeling, W.Va., Superintendent Nick Janovich says that he has ended his summer a "happy camper." Before the **Elite Rejuvenation** program he was spraying generic products every 14 days, but this summer Xzemplar has provided him 28 days of control from

all three applications on his fairways.

"Everything looks good and we haven't had any issues or disease break through," says Janovich. "It's been nice to actually reevaluate our programs. I was kind of stuck in that rut of 'this is what we've always done,' or 'this is the cheapest.' This program really opened us up to other options."

Janovich's **Elite Rejuvenation** spray program is coming to a close and his allowance of BASF product is as well. With Early Order Program season here he says that he will have to reevaluate his order this year too.

"I'm excited to switch some stuff around, and see if we can get a little better control while getting some more spacing between applications," adds Janovich. "That's how I'm going to approach this this coming EOP. Once you start to see how long a product lasts and you start figuring out the cost per acre per seven, 14, 21, 28 days. That's where I think you see the savings."

For continuing coverage on the **Elite Rejuvenation** program, visit [Golfdom.com](http://Golfdom.com).

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# Golfdom Gallery



**1 All quiet at the PGA Grant B.**  
Gannon got to the course before the crowds arrived to snap this beauty of No. 4 green.



**2 Here's the Beefs** Andrew "Beef" Johnston, with perhaps his long-lost brother, Baltusrol's Jerry Elliot, spray technician. There's so much Beef in this photo, it just about broke Twitter the day we posted it. Thanks to Jerry for sharing it with us.

**3 Editorial Advisory Board member sighting** Two members of Golfdom's esteemed Editorial Advisory Board, architect Rees Jones and Andrew Wilson, superintendent, Bethpage, were spotted at the volunteer tent at Baltusrol.



**4 We don't need no stinking badges** That's what Tom Weinert (in blue) said as he waltzed into the VIP seating area on No. 4 green at the PGA Championship. Enjoying the luxurious view with him are his co-workers, (left to right), Jim Rattigan, Tom Pepe and Grant E. Platz, all with Plant Food Co.



**5 There's always next year** Kevin Hartenberger, assistant superintendent, Erin Hills, informs his fellow former-Baltusrol intern Spencer Murphy, assistant superintendent, Toronto GC, that he's free to visit Wisconsin next year when his course hosts the 2017 U.S. Open.



**6 Rain, rain go away** Another major, another set of violent storms. Volunteers at the 2016 PGA Championship woke up Tuesday morning to washed-out bunkers across the course. These two take care of a greenside bunker on No. 1.



*Continued on page 16*

PHOTOS BY: GRANT B. GANNON (1, 5, 6); SETH JONES (3, 4)  
PHOTO COURTESY: JERRY ELLIOT (2)





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Continued from page 14

**7 Where's Willett?** We saw this year's Masters champion, Danny Willett, briefly at the PGA Championship. Now that he's been eliminated from the FedEx Cup — without taking a single shot — we'll just look forward to seeing him again at Hazeltine... and hope his cool streak ends after the conclusion of the 2016 Ryder Cup.



**8 In your life, have you seen anything like that?** The senior staff at Baltusrol was treated to a visit by CBS Sports broadcaster Verne Lundquist (center, in dark blue), who thanked the crew for their hard work. Which got us thinking, what's Lundquist's most famous call? Tiger's chip-in? Laettner's turn-around J? Or maybe, "We haven't seen Happy Gilmore play this badly since his first day on Tour. He and Bob Barker are now dead last."



**9 What's your flavor?** Based on all the hard work they were doing, Grant Sherwood, intern at Trump National GC Bedminster, and Eric Kelley, Trump National 1 Course's superintendent at Trump National Bedminster, were well deserving of dessert at the PGA Championship.



**10 Hauling around in the Hauler** Matt Zarembo, director, golf products for Textron Specialized Vehicles, rides shotgun with *Golfdom* EIC Seth Jones behind the wheel of the new Cushman Hauler.



**11 Happy hour** We caught up with Russ Harris, superintendent, Galloping Hill GC, Bloomfield, N.J., and Bill Murray, superintendent, Pinebrook GC, Belmar, N.J., at the New Jersey GCSA reception.



**12 Ready for the Ryder Cup, DJ?** Dustin Johnson didn't make the cut at the PGA Championship, but we're confident he was just saving his energy to dominate at this month's Ryder Cup.

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# THE SKY IS THE LIMIT

## DRONES, DATA AND TURF MAINTENANCE

BY DAVID MCPHERSON

The old adage “A picture is worth a thousand words” is a refrain to which golf course superintendents subscribe. Photographs help turfgrass managers explain agronomic and maintenance programs to members and sell renovation and capital improvement projects to boards of directors. A smartphone snapshot now is a powerful and ubiquitous communication tool of the trade.

Now imagine the impact when the ante is upped in the visual communication game from hand-held pictures taken with a cell phone to detailed visuals taken by drones 200 feet high in the sky that can also provide a wealth of useful data.

Drones, once viewed by many as simply a recreational toy and a way to take bird’s-eye-view pictures of a course — mainly for marketing purposes to share on YouTube, social media or a website — now are a useful agronomic aid and money-saving technology that provides everything from a clearer picture of where the divots occur most frequently to areas that are suffering from a lack of irrigation.

Mark Prieur, golf course superintendent at Trafalgar Golf and Country Club in Milton, Ontario, just west of Toronto, bought a drone last year. He finds new uses for this piece of technology every day, from taking aerial shots showing frost on the course and tweeting them so members know why there was a delay in tee times, to helping him train employees by showing proper techniques from a new, unique angle.

“It’s just another tool,” Prieur says. “When you get it, you start using it for things you never thought you would use it for. I recently used it for training purposes to show my staff a bunker (photo) taken with the drone and explaining that this is what a properly raked bunker is expected to look like when it’s done.”

The data that drones give superintendents like Prieur is limitless, thanks to innovative companies moving the technology forward. One such company, GreenSight Agronomics, provides drone-enabled golf course services that give superintendents valuable informa-

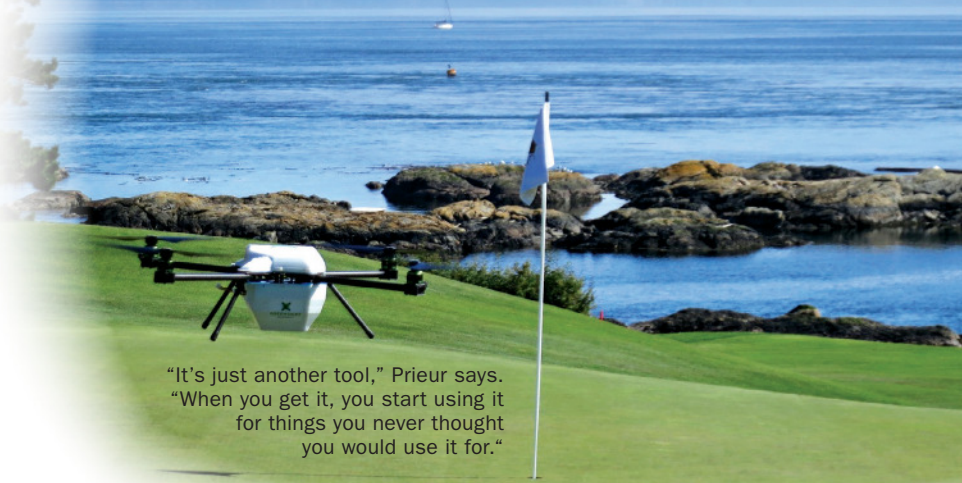
*Continued on page 20*

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tion to help them manage their staff more effectively, reduce water usage, optimize fertilizer use and avoid costly pest or fungal damage while maximizing a course's quality and playability.

"We started in 2015 with one-time surveys for golf courses, giving them a map of their course much better than what you would get from Google," explains Justin McClellan, GreenSight's chief marketing officer. "That was our beginnings. We quickly realized there was a need and an interest for this high-resolution imagery of the turf."

All of the principals in the company have backgrounds in military drone systems using custom sensors. They figured they could use their expertise in drone technology to put together an interesting thermal camera sensor package that could read and measure the moisture levels in



"It's just another tool," Prieur says. "When you get it, you start using it for things you never thought you would use it for."

turf over an entire golf course. "We also realized we could use a multi-spectral camera to start looking for turfgrass diseases and pests," McClellan adds.

### New eyes

In April 2015, GreenSight added John Kaminski, Ph.D., director of the golf course turfgrass management program at Penn State University, to its team as chief agronomy officer. Kaminski sees many

uses for this new technology, from being able to show shade patterns on fairways to seeing and identifying other troublesome patterns on the course before they become issues.

The automated drone technology developed by GreenSight can scan every inch of a course multiple times a week. Its custom multispectral camera captures five times the data of a typical camera and allows superintendents to detect evidence of pest and pathogens before they become visible to the naked eye. The thermal cameras also measure the temperature of all of the course's turf.

After these scans are complete, the drone lands on its base station and automatically is recharged while the image data is downloaded. The extensive data is then processed by GreenSight's proprietary analysis software. The software scans the multispectral image data for evidence of pests or pathogens and tracks daily changes. The temperature data is analyzed and used to develop a soil-moisture map of the course. Areas that are too dry or too wet are flagged before turf health begins to deteriorate.

After each flight survey, GreenSight's system automatically sends the user an e-mail or text message report based on the scans to let superintendents know what issues are happening and where. Superintendents also can compare today's imagery to last week's, last month's or last year's with an app or website.

"We offer a complete system: our camera/drone and the assembly and instal-

Continued on page 22

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*Continued from page 20*

lation of the drone that is off-the-shelf technology, but built around our camera," McClellan explains. "We include software that puts all the images together. With daily flights we can see what changed from yesterday to today. Instead of just 100 acres of photos, our software can analyze for you detailed data, like here are the 20 acres on the course where we saw something change, the 10 places we saw the course drier and the 10 places we saw the beginnings of a pest infection. We hope to save superintendents time, not give them too much data that they don't know what to do with."

GreenSight is ready to roll out to courses in Florida and Arizona this fall a subscription-based service and app that measures soil moisture via thermal images that will tell golf course managers the percentage of moisture in their soil. "For example, that could be a very powerful tool for someone looking at installing a new irrigation system where they have independently controlled sprinkler heads," McClellan says. "Superintendents will be able to see, on a daily basis, areas that are drying out or receiving too much water, and can easily pinpoint issues with the irrigation system, like leaks."

For Kaminski, how companies such as GreenSights integrate and share the data once it's collected is the key to the technology reaching its full potential. "With all that data being collected there is a need for sophisticated reporting and analysis," he explains. "A superintendent won't get the full benefit of this tool without data interpretation and integration between systems like golf carts, labor tracking and GPS sprayers. Without this cooperation, you'll risk having an overwhelming amount of data that will never be useful."

"Superintendents will be able to see, on a daily basis, areas that are drying out or receiving too much water," says McClellan.

## Trial by the Pacific Ocean

Paul Robertson is one of GreenSight's first superintendent customers, and he currently is beta testing their product. The links superintendent at Victoria Golf Club in Oak Bay, British Columbia, Robertson gives credit to his assistant, who first saw mention of the technology on Twitter. Robertson immediately contacted GreenSight to ask how his club could get involved in using its equipment.

"I really believed in the technology," he explains. "They were good to commit to us being one of the first test sites. The rest is history."

This past July, GreenSight's team arrived at the historic club, which was founded in 1893, to set up an antenna on the roof of Robertson's maintenance shop and install other components that communicate constantly with the drone. Robertson initially hoped they could fly the drone as high as 500 feet, but because their club is situated on a point and an outward piece of property near the ocean is in airspace frequented by floatplanes and helicopters, Transport Canada approved a flight certificate to fly to a maximum of 200 feet.

The drone at Victoria GC currently flies from 5 a.m. to 8 a.m. "I wanted to create our baseline images of the golf course in the morning," Robertson says. "Hopefully, we will eventually have a noon flight too, so our irrigation technicians can see where we started and where we finished to extrapolate some irrigation data from those two different time-stamped images."

After one month into their trial, Robertson and his staff already are reaping benefits from the wealth of data provided by the drone. "The main reason we wanted to use this technology was to get a better idea on water management," he says. "I can already see other (uses) for it. You can take the infrared images and eventually we can add a temperature camera that will allow us to collate that data into some sort of soil moisture amount.

Over time, we can take what we see in infrared and transfer that into percent soil moisture so we can eliminate or reduce the need for people out on the course with hand-held devices collecting soil moisture data."

Last year, Robertson had two to three students out in the morning probing fairways and two additional staff members probing greens. The data they collected dictated how much water they were going to put out on the golf course at night or how much hand watering they needed to do. "These readings, though, are only as good as the amount of points of data you take," Robertson explains. "For example, on a green I would take anywhere





between nine to 12 data points, and that gives you just a representative sample. These infrared images are right down to the millimeter/inch, so they give you precise control.

“Over time we are hoping to see early diagnosis of disease by seeing different changes in the temperature in the photos and a different reflection of the green light,” he adds. “That might be an indication of a disease like anthracnose or Pythium; You just see the turfgrass reacting differently to a stress in an area.”


What Robertson mainly has seen in the first month of use is compaction. “You really notice the areas of compaction on the golf course,” he says. “The greens just shine bright red. We hope as we go to aerate this fall (that) we will see a change to this compaction. That was our first big clue there will be other uses for this technology.”

Robertson also sees the technology helping with his tree management program, with a better method of identifying trees with health issues. The club already spent a lot of money to get an arborist to inventory all of the trees on the property and label them from 1 (least concern) to 3 (most hazardous). “I’m hoping that this infrared image will be able to show those trees looking differently, reflecting light differently and further pinpoint our management programs,” he says.

Finally, beyond saving money on water, the technology also aims to help superintendents identify signs of diseases much earlier and zero in on the problem areas, which should lead to a reduction in pesticides and fungicides. “We might get to a point where we can look at areas of the golf course and say, “That turf needs more nitrogen based on the reflection of the green light,”” Robertson says. “I’m really looking forward to reducing pesticides by looking at the greens and only having to spray those areas that are hot and showing signs of stress, indicating they might have a disease forthcoming.”

Cost savings can come, Robertson says, between the labor redistribution and reduction in watering to lowering the pesticide budget, which he figures could be as much as 10 percent if he can pinpoint diseases earlier and with more accuracy.

“Last year I spent \$15,000 on hand probing, but what happens if I replace that labor with the drone?” he asks. “I wouldn’t eliminate those employees, but I would put them on the golf course doing other things like hand watering, bunker maintenance, fly mowing, etc. I just wouldn’t have them stuck on the end of a probe.

“The sky truly is the limit,” he concludes. “There has been a lot of game-changing technology in the golf industry in the last 20 years. I think most courses will have this technology in the next five years, even if it is just for promotional purposes.” 

**David McPherson is a Toronto-based freelance writer and corporate communicator. Follow him on Twitter @mcphersoncomm.**

More information is available at [www.Greensightag.com](http://www.Greensightag.com).

# 98

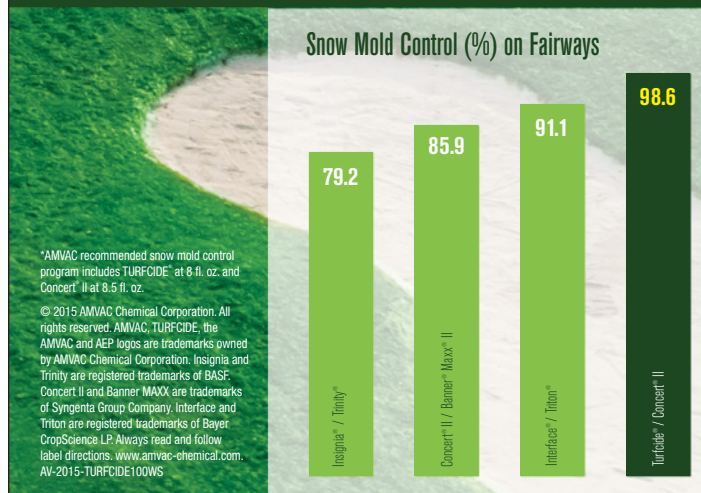
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Autonomous mowers will provide the golf maintenance industry relief from its labor crisis. The question is when.

# THE FUTURE WORKFORCE

BY DILLON STEWART

It isn't just that good help is hard to find these days. It's also hard to afford.

Case in point, Jeff Miller, superintendent at The Santaluz Club in San Diego, who was faced with a labor shortage. So he decided to hire a robot.

Last year, Cub Cadet released the RG3 robotic putting green mower after its January 2015 acquisition of Precise Path Robotics. Miller was sold on it as soon as he saw it demon-

strated. He started with one unit to test its efficiency. He's already bought three more, which he says will save him an estimated \$86,000 to \$113,000 per year.

He operates each mower on five greens, the maximum capacity for one machine. Each morning before golfers get on the course, a crew member — the RG3's wingman — hauls one to a hole and leaves it on the edge of the green. He situates four beacons around the outside of the green in a pattern specific to that hole. The beacons and the mower exchange sound

*Continued on page 26*

# RG3

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Continued from page 24

waves, which tell the mower what green it's on and that green's cut specifications. Once the beacons are set, the wingman activates the mower, and the robot cuts the green on its own.

Miller reports that his operation runs more efficiently than ever and the robots haven't erased his human workers. In fact, he hasn't let anybody go and doesn't plan to. Instead, he reallocates the labor to other tasks. Where he used to send a three-man crew, he now sends one crewmember and the robot. While the mower cuts, the wingman performs other tasks on the green. The RG3 cuts an average green of 5,000 square feet in about 50 minutes, giving the wingman a specific time frame for completing his end of the work.

"We do so much work by hand, like raking and rolling, that it just fit our operation perfectly," Miller says. "When I put the robot out there, I free up three guys in the morning."

## Dabbling with technology

Robots are big business these days. From idea to implementation of any robotic technology takes years of work and millions in investment to come to fruition.

The National Robotics Engineering Center (NREC) is a developmental wing of the renowned Robotics Institute at Carnegie Mellon University's School of Computer Science in Pittsburgh. The 1,000-person Robotics Institute is one of the largest bodies of researchers studying the technology in the world. These minds are so coveted that Uber poached 40 of its faculty to work on an autonomous cab, leaving the company with a \$5.5 million donation as reparation.

About 50 percent of NREC's budget comes from partnerships with the U.S. government. The largest part of that fraction comes from the U.S. Department of Defense, for which NREC builds autonomous battle vehicles. NREC also has public sector partners, like John Deere. Its agriculture division isn't selling driv-

erless equipment yet, but products like the AutoTrac and the Auto Steer systems guide tractors to harvest crops, lay seed and perform general tasks at an efficiency rate unmatched by human control. All the while, the operator, or supervisor, sits back and monitors data on a video screen. *The Washington Post* even called Deere more progressive on autonomous technology than Google.

Jeff Legault, NREC's director of strategic business development, says its purpose is to turn the Robotics Institute's research into something tangible that its partners can bring to market.

"We're trying to solve problems for clients instead of doing research of our own," he says. "The problem is solved when we find the lowest cost solution."

Currently, John Deere's only foray into the robotic mower market is its Tango, a Roomba-vacuum-style mower for consumers that sells in England. Other mower manufacturers have gone down

*Continued on page 28*



Cub Cadet's robotic mower exchanges sound waves with beacons around a green that tell the unit what green it's on.



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"There's going to be robotic golf equipment, and the big driver is the saving of labor," says Cuddihe.

Continued from page 26  
this road, too.

Toro experimented with the idea of an autonomous mower more than a decade ago. In 2002, the company partnered with NREC to build an autonomous mower for the golf market. Toro gave NREC two mowers for the prototypes: a Greensmaster 3100 for mowing putting greens and a Groundmaster 3500 to mow sports fields.

"The hypothesis is if you can make a two-man crew into a one-man crew or a three-man crew into a two, it reduces the cost of labor," says Dana Lonn, managing director of The Toro Co.'s Center for Advanced Turf Technology.

NREC and Toro were successful in building an autonomous mower prototype. Unlike a Roomba-style robotic mower, the autonomous mower did not need beacons or guide wires to operate. Instead, it used technology like Lidars, Pose Estimate and GPS to learn its position, surroundings and terrain and react to them. It gave the mower pinpoint ac-

curacy and the ability to stop if a human or object got too close.

Though it worked, NREC and Toro were unable to produce the equipment at a realistic price, which the company saw as about double the market price for a commercial mower. At the time, this advanced technology wasn't cheap enough. So Toro abandoned the project, and though the two organizations keep in touch, they haven't actively worked together since 2013.

### Leap forward

Rick Cuddihe is president of Rick Cuddihe & Associates, which operates Lafayette Consulting Co. While on assignment for a client of his consulting firm in 2009, Cuddihe was researching the commercial mower market and mostly found what he calls, "varying degrees of good."

Upon further research, Cuddihe stumbled upon NREC's website detailing the project with Toro. He was enamored by the idea. He did more research and realized it

could be done, and it could be done affordably. In his opinion, the robotics mower market is on the verge of a great leap forward, and he hopes to be a part of it.

"It's my opinion that there's going to be robotic golf equipment, and the big driver is the saving of labor," says Cuddihe. "I've surveyed golf course owners all over the country and it has showed me that the average salary for an operator is \$26,000."

That's about the same price that Cuddihe wants his autonomous mowing attachment — yes, an attachment — to cost. A golf course with three operators can go down to one operator who transports the mower from hole to hole and then cuts the greens and fringe while the robot knocks out the fairway and rough.

Sorry, no help with the fringe or around bunkers. Cuddihe says no one would make the investment in the necessary technology. What it would be capable of is exiting a fairway or rough as soon as a golfer sets foot on the tee.

Continued on page 30

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



*John Zimmers,  
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and David Delsandro,  
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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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Continued from page 28

On each tee box, a small electronic touch pad would allow golfers to control a mower in the fairway or rough. When golfers tap the pad, the mower would immediately exit 60 yards off to the side and sit there for 11 minutes to give the golfers a chance to finish the hole.

If the golfers don't see the mower and hit a ball in its path, sensors on the unit would lift the reel 4 inches before the ball and 3 inches after.

"If this thing works the way we plan for it to work, somebody is going to like it," says Cuddihe.

### Technological advancements

Cuddihe, 67, knows the mower market. He's been all over the industry, and fondly recalls the first days of zero-turn

mowers. He's now formed a partnership with the NREC, started Robotic Turf Equipment, and is embarking on a quest to bring an autonomous mower to market.

"It doesn't interest me to do the same thing everyone else is doing," Cuddihe says. "What excites me is bringing something new and different to the market."

Since the Toro project faltered the technology became cheaper and more accurate, Cuddihe says. In the first run, GPS technology was too weak. RTK base stations, which bolster GPS strength within a 100-meter radius, had to be used. Today they're no longer necessary. Lidar — a device that is similar in operation to radar but measures distance by emitting pulsed laser light instead of microwaves — is cheaper now and can be coupled with or even replaced by cameras that can sense objects,

similar to how the iPhone camera detects a face. The technology is so advanced today that a mower could have the ability to discern between flowers, weeds and grass.

"(People) are starving for ways to produce more work with the same amount of labor, increasing the productivity of their employees," he says.

Cuddihe is crisscrossing the country trying to sell the innovative product.

He is targeting manufacturers with stakes in the golf market, like Jacobsen, John Deere and Toro.

If the autonomous mower hits the market, there might be sticker shock. Cuddihe estimates the entire system would be a \$25,000 addition. But with the labor it could save an operation, it would be worth the investment, he says.

Continued on page 32



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Continued from page 30

There are challenges. He's trying to convince investors without a prototype. Cuddihe estimates a \$2.5 million to \$4 million investment is necessary for a completed project, which, to him, means getting a product to market.

Furthermore, the technology is vast. To come up with the most affordable solution, NREC researchers want to build a mower specific to the needs of a customer, which hasn't been defined yet.

"Does it need to work at night? Does it need to work in the rain?" asks NREC's Legault. "Maybe, maybe not. But the next step is engineering the system for a particular market and a particular application."

Companies have met with Cuddihe and are interested in the technology, but they're turned off once they find

out there's no prototype. It has created a chicken-and-egg scenario. To get an investor to believe in a product, he needs a prototype. To get a prototype, he needs an investor.

"Just come to NREC," Cuddihe says to nonbelievers. "Once people see what's going on here, they'll know it's possible. And once a prototype is built, everyone is going to want a piece of this technology."


### El Santaluz Cinco

Back at Santaluz Club, Miller is now up to a total of five RG3 autonomous mowers working on the course. Four he has purchased and another "loaner" that was intended to be a back-up just in case one mower broke down. Miller couldn't help himself, and put the fifth mower to work on Santaluz's greens and 10,000-square-

foot nursery. He's now looking to buy the loaner too because because "everything runs a lot smoother."

"It's nice to just set it down on the nursery and come back a couple hours later to a finished job, instead of having someone mow it," adds Miller.

The robotic uprising hasn't taken over Santaluz just yet. Miller was able to hire four more crew members to his staff about a month after he bought the additional RG3s.

"Superintendents need to be patient," says Miller. "It's in the early stages, and we need to be supportive of the technology." 

Dillon Stewart is associate editor of *Landscape Management* magazine, *Golfdom's* sister publication. *Golfdom* associate editor Grant B. Gannon contributed to this story.

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# Super Science

## // CONTINUING EDUCATION

### THE 13TH INTERNATIONAL TURFGRASS RESEARCH CONFERENCE

By Clark Throssell, Ph.D.

The 13th International Turfgrass Research Conference (ITRC) will be hosted by the United States and will be held July 16-21, 2017, at the Hyatt Regency Hotel adjacent to the Rutgers University campus in New Brunswick, N.J. This will be the first time this conference has been held in the United States since 1993. ITRCs are held every four years on behalf of the International Turfgrass Society, a not-for-profit, non-commercial organization that exists for charitable, educational and scientific purposes and for the advancement of turfgrass science.

The objective of the ITRC is the dissemination of independent, scientific turfgrass research and case studies from around the world. Papers presented at these conferences are subject to independent peer review for scientific and technical merit by an international community of turfgrass researchers.

The 13th ITRC will bring together researchers, technical experts, consultants, high-level turfgrass managers, top industry delegates and government officials. This is a great opportunity to meet your current and future colleagues, business partners and customers face-to-face at one of the largest and most comprehensive gatherings of turfgrass professionals anywhere in the world. Approximately 400 to 500 participants from 26 countries are expected to participate.

Many companies and organizations already have agreed to sponsor the ITRC. Their generous support will allow organizers to provide a first-class experience for attendees while holding the line on registration costs and providing travel grants and best-presentation awards for student attendees. A list of current sponsors can be found at <http://turfsociety.com/itrc2017/#sponsors>, and sponsorship opportunities can be found at <http://turfsociety.com/itrc2017/pdf/ITRC-Sponsorship.pdf>. We hope that you will consider joining this elite group of ITRC supporters.

The theme of the conference, "Meeting the Challenges of a Changing Environment," was selected because it reflects the tremendous impact that the environment has had and continues to have on our personal and professional lives. The conference will feature keynote addresses, symposia, tours of turfgrass sites and oral and poster presentations.

All with an interest in turfgrass science and management are welcome to attend. Find more information on the International Turfgrass Society and the 13th ITRC at <http://turfsociety.com/itrc2017/>. Registration will begin next month.

## NEWS UPDATES

### INDEMNIFY RECEIVES REGISTRATION IN FLORIDA

Indemnify, a new solution delivering preventative and curative nematode control from Environmental Science, a business unit of Crop Science, a division of Bayer, is now registered for use in Florida.

Indemnify is proven to control nematodes in turf and to promote overall plant health without causing course disruption, Bayer said. Without the need for course closure or undesirable application methods, Indemnify can be used on both warm- and cool-season turf in all areas of the golf course.

The active ingredient in Indemnify, fluopyram, offers strong curative and preventative nematode control to help improve root formation. It is effective on sting, root knot, *Anguina pacifica*, and many other species of nematodes. Indemnify is optimized for flexible application anytime nematodes are active and provides turf managers with a valuable solution for premier nematode management. Indemnify's formulation is designed to penetrate the soil profile where nematodes thrive.

For maximum efficacy, Bayer suggests two applications in the fall to control nematodes prior to peak golf play during the winter months in Florida. In other regions, spring applications will control nematodes throughout summer play.

At a rate range of 0.195-0.39 fl oz per 1,000 square feet, each 17.1 oz bottle of Indemnify treats 1-2 acres.

“WITH THE ELIMINATION OF OVERSEEDINGS IN RECENT YEARS, DISEASES ARE MUCH MORE NOTICEABLE AND PERHAPS EVEN MORE DAMAGING...”

Bruce Martin, Ph.D.

(see story on page 34)



//MANAGING ULTRADWARFS

# Winter diseases in bermudagrass putting greens

By Bruce Martin, Ph.D.

**T**he adoption of ultradwarf bermudagrasses (*Cynodon dactylon* X *C. transvaalensis*) by the golf course industry in regions where bermudagrass can be cultured on putting greens has been a “home run.” In the hands of skilled superintendents, these grasses make outstanding putting surfaces.

Since the introduction of ultradwarf cultivars, many conversions of older bermudagrass cultivars or creeping bentgrass (*Agrostis stolonifera*) greens to one of the ultradwarf cultivars have taken place in southern states, even well into the cooler Transition Zone environments. Superintendents and others have had to re-learn some lessons concerning their culture and maintenance with regard to disease occurrence.

For instance, when planted on sandy root zones with relatively high ‘perc’ rates, the turf of course is more prone to drought. The ultradwarf bermudagrasses, including TifEagle, Champion and MiniVerde, generally have a shallower root system than does TifDwarf. That fact also increases the risks of drought and occurrence of hydrophobic zones, such as localized dry spots. When root-active pathogens such as *Gaeumannomyces graminis* var. *graminis* (a pathogenic component of “bermudagrass decline”) or plant parasitic nematodes are present, it transforms a weakness into a liability that superintendents must recognize. Even diseases that are active on leaves, such as dollar spot (*Sclerotinia homoeocarpa*) and leafspot (*Bipolaris cynodontis*) can occur at higher levels when root zones are dry and nutrient uptake is reduced.

**FIGURE 1**



Water-soaked lesions and initial mycelium development of microdochium patch in bermudagrass.

One suggestion to reduce the impact of these diseases is to plant these grasses in root zones that hold moisture and nutrients a little stronger, such as a mix containing 3 percent to 5 percent field soil by volume, as long as testing shows this to be a good compromise and drainage still is considered adequate.

Management of these grasses is relatively intense and requires close attention to routine and consistent cultural practices in order to manage organic matter. Through about the mid-2000s, these greens routinely were overseeded with *Poa trivialis* (rough bluegrass), primarily for winter play and color. Rough bluegrass also provided an excellent putting surface over the bermudagrass base. However, for the past several years, more and more courses are opting to not overseed

but instead are using turf colorants for winter color. Use of turf colorants is an art and a science, and this practice generally has been successful as an alternative to overseeding.

However, winter diseases in ultradwarf bermudagrass greens can be quite damaging and highly visible. When greens are overseeded with cool-season grasses, any ills that might occur on bermudagrass are mostly masked in the winter months. On the cool-season turf overseedings, primarily dollar spot, occasional *Pythium* blight (*Pythium* spp.) and perhaps brown ring patch (*Waitea circinata* var. *circinata*) could occur, especially during spring transition. At times, microdochium patch (*Microdochium nivale*) occurs in cold, wet conditions on *Poa trivialis* overseedings. This generally is easily controlled with fungicides such as

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chlorothalonil or iprodione. These diseases are dependent on specific environmental conditions, particularly abundant moisture and prolonged favorable temperatures, and their occurrence generally is acute and not chronic.

However, with the elimination of overseedings in recent years, diseases are much more noticeable and perhaps even more damaging because of increased stress on the turf itself without the cushioning effects of overseedings. The primary winter and spring diseases of ultradwarf bermudagrass are leaf spot (*Bipolaris cynodontis*), spring dead spot (*Ophiosphaerella korrae* and *O. herpotricha*), *Pythium* blights and root rots and microdochium patch.

#### MICRODOCHIUM PATCH

Microdochium patch may be the most common and chronic of these diseases on bermudagrass greens. It has been known for many years as a pathogen of bermudagrass and many other grasses, but was not considered to be of much importance until recently, when its effects have been noted on greens not overseeded. Pathologists are re-examining it as a serious pathogen when weather conditions are cold, wet and prolonged.

One reason it may be common and chronic is that the organism can cause noticeable disease under a wide range of canopy temperatures. Ideally, the disease is most severe from freezing temperatures through the mid-40s F, but it can persist and even be active when temperatures are in the 60s. Turf recovery is not an option when bermudagrass is dormant or semi-dormant, so symptoms from an uncontrolled outbreak can persist for months and provide voids in the turf that affect putting and promote thinned turf that is prone to algae infestations.

Symptoms of microdochium patch can resemble initial *Pythium* blight or even leaf spot symptoms.

Microdochium patch generally is most likely to occur on turf not protected by fungicides during cold, wet weather. It initially begins as small, water-soaked patches an inch or so in diameter, but can increase in size to patches up to a foot or more in diameter as patches coalesce. These symptoms closely resemble those that occur in cool-season grasses, but are not as distinct. Water-soaked patch margins are quite visible during active disease in cool-season grasses but may require a hand lens or microscope to notice in bermudagrass leaves (Fig. 1).

Many fungicides are labeled for microdochium patch, although labels may mention synonymous names for the disease, such as fusarium patch or even pink snow mold. Fungicides likely control microdochium patch best when the turf is still growing and can still recover from damage, conditions occurring only in early fall or during spring transition. In winter, if the turf is dormant, the fungus may be controlled, but if damage has occurred it likely will be visible until turf can grow and recover. In cool-season grasses, microdochium patch

is promoted by excess nitrogen fertilization going into winter, high soil pH and thatchy turf. Most ultradwarf greens are not fertilized at high levels, especially in the fall and winter, but higher soil pH levels might be a factor that could promote the disease. These questions await needed research in bermudagrass greens.

#### SPRING DEAD SPOT

The Compendium of Turfgrass Diseases, Third Edition, states "Spring dead spot is the most important disease of *Cynodon dactylon* and *Cynodon* hybrids in North America and Australia." Research recently conducted by Alejandro Canegallo and me shows that we can add Argentina and Uruguay to that list. Certainly that is true in U.S. Transition Zone environments, as the spring dead spot (SDS) symptoms appear during spring green-up after winter dormancy (Figure 2).

If bermudagrass greens are cultured in semi-tropical or tropical environments the disease does not occur, and only sporadically occurs in the

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FIGURE 2



Spring dead spot in ultradwarf bermudagrass green at spring green-up.

**FIGURE 3**



Leaf spot on an ultradwarf bermudagrass green.

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cooler part of the semi-tropical region. This is because the fungi capable of causing SDS infect the roots of bermudagrasses and colonize cortical and stele tissues thoroughly in susceptible grasses, weakening them such that they have poor survival after cold winters. Bermudagrasses that have been developed specifically for better low-temperature tolerance (e.g. Patriot, Latitude 36 and others most recently out of Oklahoma State University) have also been shown to have better tolerance to SDS. None of the currently cultured ultradwarf bermudagrasses were developed for low-temperature tolerance, and all are quite susceptible to SDS when cultured in environments where they go winter dormant or semi-dormant.

Major progress in the identification and understanding of SDS causal agents and their occurrence has occurred over the past two and a half decades. It is now accepted that the disease can be caused by any of three species of *Ophiosphaerella*: *O. korrae*, *O. herpotricha* and *O. narmari*. The development and use of specific DNA primers for each of these potential causal agents, and tools

such as real-time PCR, have provided the means to identify these agents from infected roots without having to culture them in artificial media. These and other tools have led to the ability to effectively survey large numbers of SDS infection centers to determine the diversity of existing causal agents.

This research has confirmed that *O. herpotricha* is rare in the southeastern United States but occurs with higher frequency in Oklahoma, Kansas and Missouri. *O. korrae* is the primary pathogen in the southeastern U.S. *Ophiosphaerella. narmari* is rare in the United States but occurs in California. It has recently been shown that the cause of SDS in Argentina and Uruguay appears to be solely due to *O. herpotricha*.

Additionally, research conducted at North Carolina State University suggests that knowledge of the specific causal agent at a site may be important. Researchers there studied the effects of fertilizing with ammonium sulfate versus calcium nitrate on SDS caused by either *O. korrae* or *O. herpotricha*. In a three-year study, plots inoculated with *O. herpotricha* had less disease when fertilized with ammonium sulfate (an acidifying fertilizer), while disease in

plots inoculated with *O. korrae* was not suppressed with ammonium sulfate but was suppressed with calcium nitrate. Additional research is needed on this topic, which opens the potential for real suppression of disease without the use of fungicides, an attractive prospect on fairways.

Spring dead spot has not been unknown in older cultivars of hybrid bermudagrasses such as Tifgreen and TifDwarf. However, the use of fenarimol (Rubigan) for *Poa annua* control in overseeded bermudagrass putting greens put SDS out of sight and eventually out of mind.

Rubigan was the best material for control of *Poa annua* in bermudagrass greens when applied in a series of applications prior to *Poa annua* germination. Rubigan also is a good fungicide for SDS, and application timing for both SDS and *Poa* control coincides in late summer and fall. In fact, in multiple trials conducted by several researchers, Rubigan was the most efficacious of the labeled fungicides for SDS.

However, a couple of factors led to some dramatic outbreaks of SDS in ultradwarf bermudagrass putting greens. One factor was that superintendents began using alternative methods to control *Poa annua*, such as sulfonylurea herbicides, instead of Rubigan. The other factor was that some single-component fungicides, which are labeled for SDS, have limited efficacy and include azoxystrobin, fluoxastrobin and thiophanate methyl.

Rubigan has been discontinued for sale, and only existing stocks can be used until depleted. This has increased the reliance on other chemistry such as formulations of tebuconazole (Torque 3.6SC, Mirage 2SC), which have performed moderately for SDS control on greens compared to Rubigan but have been improved in mixtures with thiophanate methyl. Trials at Clemson in multiple years

Continued on page 38



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have shown good suppression of SDS with Headway (azoxystrobin + propiconazole) at 3 oz. per 1,000 sq. ft. alternated with Briskway (azoxystrobin + difenoconazole). We have also seen in several trials that two of the new SDHI fungicide products, Velista (penthiopyrad) and Lexicon (a combination of pyraclostrobin and fluxapyroxad), have provided excellent SDS control during the past two years. This brings about the possibility of having fungicides available with high efficacy for SDS and without the baggage of growth regulation from certain DMI fungicides.

Superintendents managing bermudagrass greens in environments where SDS can occur should have new tools at this time to manage the disease, even on newly established greens where turf is not completely mature and where options with DMI fungicides are less desirable.

### LEAF SPOT DISEASES

Leaf spot diseases on ultradwarf bermudagrasses can be caused by up to three or more species of *Bipolaris*:

*B. cynodontis*, *B. spicifera* or *B. sorokiniana*. In recent work, the most commonly encountered pathogen in the southern states appears to be *B. cynodontis* (Figure 3). Leaf spot most often is noted in cooler seasons, when the growth of bermudagrass slows, such as in the fall in the Transition Zone or fall, winter and spring in states such as Florida. It is a chronic disease promoted by low fertility levels, increased thatch, dry root zones and humid turf canopies. In other words, conditions closely mimicking those that promote dollar spot. It's not uncommon to find both diseases active in a turf stand in fall months.

Leaf spot and other cool-weather diseases have become more important in recent years. The elimination of overseeding with cool-season grasses has provided a system where leaf spot can be visible and damaging for many months in the fall, winter and spring.

Because of this, we have increased our fungicide deployment to the point now that programs such as those used for creeping bentgrass or *Poa annua* greens in summer are being studied and used for ultradwarf bermudagrass

greens. As with creeping bentgrass in heat-stress environments in the South, we have learned to be careful with most of the DMI fungicides on bermudagrass greens because of their growth-regulating properties. In fact, most use of DMI fungicides likely will be relegated to fairy ring control in early spring applications as the possibility for other options in fall for SDS are now here.

Deployment of fungicides for bermudagrass greens disease control should be based on knowledge of disease infection periods, damage potential and likelihood of specific disease outbreaks, or problems such as the strengths, weaknesses, label restrictions, resistance issues and price of the fungicides.

More work is needed with leaf spot management. Recommendations to increase fertility levels (within reason), manage thatch, limit leaf wetness periods and to be careful with growth regulation when turf is slowly growing are valid and should help. But reliance on fungicides as the primary method to control leaf spot in some environments may lead to development of resistant populations of these pathogens.

Even now, superintendents should incorporate some of the good contact materials, such as chlorothalonil and mancozeb, in their programs for good control as well as for resistance management. These old fungicides still are extremely valuable in this respect, as well as being good tools to combat algae infestations that follow leaf spot epidemics.

We are fortunate also to have new active ingredients such as fluazinam (Secure) and some of the new SDHI fungicides to help with winter diseases. These should be useful to prevent the overuse of Qoi fungicides, which have a history of selecting resistant populations of pathogens in some turf pathosystems. Superintendents managing bermudagrass greens historically have

Continued on page 40

FIGURE 4



Severe *Pythium* blight on a bermudagrass green in winter 2015.



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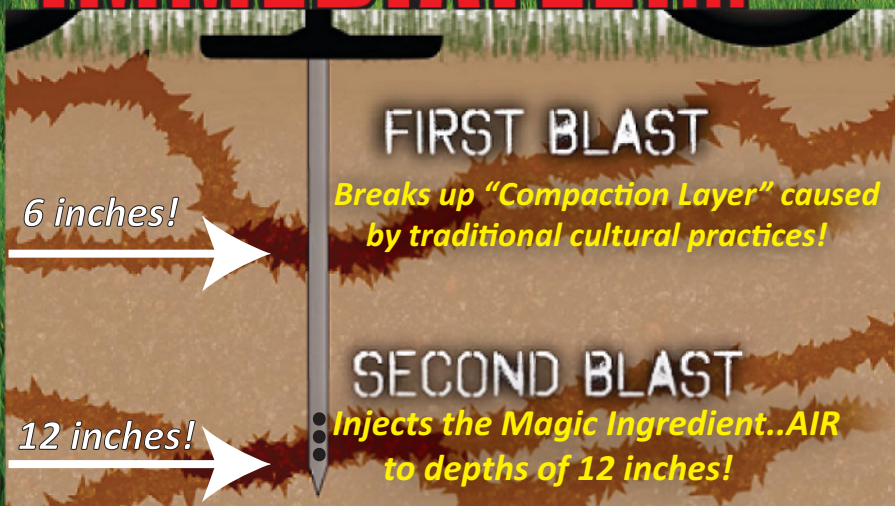


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Continued from page 38

not seen problems with fungicide resistance, but that is not a reason for complacency now as fungicide use increases.

## PYTHIUM DISEASES

There is a lot of information regarding *Pythium* as a cause of blights, root rots and root dysfunction in cool-season grasses such as perennial ryegrass (*Lolium perenne*) and creeping bentgrass. However, there are few studies on *Pythium* and its role as a pathogen of bermudagrass. This is in spite of its diagnosis on bermudagrass frequently through public and private diagnostic labs. During the fall and winter of 2015 in the Carolinas, *Pythium* blight was painfully obvious as a result of flooding rains (Figure 4).

Control has been achieved with typical fungicides labeled for *Pythium* diseases such as mefenoxam, phosphonates, propamocarb, mancozeb and cyazofamid. However, little is known of the causal agents and when they are exerting their most damaging effects. One study at Clemson determined that *P. myriotylum*, *P. arrhenomanes*, *P. aristosporum*, *P. rostratum*, *P. graminicola* and *P. vanterpoolii* were present on bermudagrass roots during spring sampling, and that *P. myriotylum*, *P. arrhenomanes* and *P. aristosporum* were highly pathogenic to bermudagrass in growth chamber inoculations. Some of these *Pythium* species are the same as those implicated as major pathogens of creeping bentgrass roots, causing *Pythium* root rot. A study in Florida showed *P. irregulare* as a pathogen of bermudagrass encountered there during spring transition.

Although *Pythium* can attack bermudagrass at any time of the year, it's most frequently observed and diagnosed as a pathogen during the fall, winter and spring, when bermudagrass is not vigorously growing. *Pythium* blight occasionally causes

problems on newly sprigged bermudagrass during establishment when abundant fertilizer and irrigation are applied. But it can and does occur on well-established and older greens in cooler months, as noted. Excess moisture is a factor common to all *Pythium* diseases in any turfgrass, and that observation holds true when it occurs on bermudagrass.

One thing is certain. Superintendents in the Carolinas have learned to respect the role of *Pythium* as a major pathogen of bermudagrass during heavy rains in fall, winter and spring. And university scientists and others in the industry have learned also that *Pythium* can be quite damaging and deserving of research for biology studies and control options to develop best management practices.

In the meantime, when abundant and prolonged rainfall occurs, superintendents are well advised not to forget *Pythium* and to consider proactive application of effective fungicides.

**Bruce Martin, Ph.D.**, is a turfgrass pathologist at Clemson University. You can reach Bruce at [sbmrtnclemson.edu](mailto:sbmrtnclemson.edu) for more information.

## References

- Hendrix, F.E., W.A. Campbell, and J.B. Moncrief. 1970. *Pythium* species associated with golf turfgresses in the south and southeast. *Plant Disease Reporter* 54:419-421.
- Latin, Richard. 2011. A practical guide to turfgrass fungicides. APS Press. 270 pages.
- Leslie, Mark. 2013. The ultradwarf revolution: Superintendents from the transition zone southward are sleeping better at night because of a sweeping change in bermudagrass cultivars. *Golf Course Management*. November. 81(11): p. 42-46, 48, 50, 52, 54, 56, 58.
- Luc, John Eric, Canegallo, Alejandro, and Bruce Martin. 2005. Spring dead spot in bermudagrass greens in Argentina and South Carolina. *Golf Course Management*. September. 73(9): p. 92-95.
- McCarty, Bert and Alejandro Canegallo. 2005. Tips for managing ultradwarf bermudagrass greens. *Golf Course Management*. June. 73(6): p. 90-95.
- O'Brien, Patrick and Chris Hartwiger. 2014. Calculating costs confidently: A thorough analysis is a must when comparing operating costs between creeping bentgrass and ultradwarf bermudagrass greens. *USGA Green Section Record*. May 2. 52(9): p. 1-6.
- Parker, Shane. 2005. Determining the Role of *Pythium* fungi in spring transition and summer decline in bermudagrass putting greens. M.S. Thesis, Clemson University.
- Stiles, C. M., L. E. Datnoff, and P.A. Rayside. 2007. *Pythium* spp. isolated from bermudagrass during overseed transition in Florida and pathogenicity of *Pythium irregulare* on *Poa trivialis*. *Plant Disease* 91(10):1237-1244.
- Whitlark, Brian. 2012. Nonoverseeded ultradwarf bermudagrass greens: faster, smoother, sooner. But managing them in the winter can be tricky. *USGA Green Section Record*. March 16. 50(6): p. 1-5.

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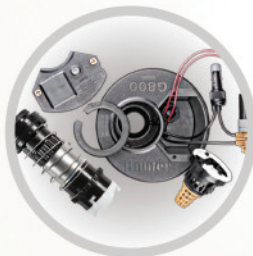
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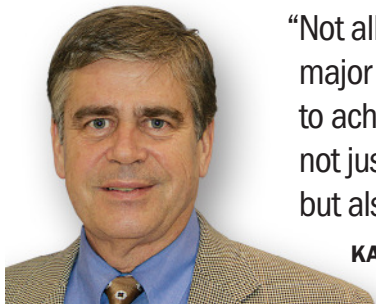
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“Not all of us can host a professional or major tournament. However, the desire to achieve a common goal is important, not just to today’s golf environment, but also to your well-being.”

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

## Keep your eyes on the prize

**A**fter my dad returned from World War II he went to college on the G.I. Bill and received his four-year degree in Art. Upon graduation and being newly married, he was quite fortunate to get a job as a graphic designer with the United States Air Force. He was stationed at Chanute Air Force Base in Rantoul, Ill. Chanute was a large technical training facility, but on occasion served as the base of operation for the U.S. Air Force Thunderbirds when they were performing in central Illinois and eastern Indiana.

During the summer my dad would sometimes take us to air shows, where we would watch the Thunderbirds do precision and acrobatic flying routines. One time he took us to watch the Thunderbirds take off and land from a show. In between, we got to see the ground operation. I soon realized that there is more to the Thunderbirds than six pilots flying F-4 Phantoms (they now fly F-16s). My dad told me that more than 100 of the best Air Force professionals, enlisted and civilian, are focused on putting those jets in the air to demonstrate to the public the highest level of Air Force capabilities.

I observed this same type of commitment and focus during the 2016 U.S. Senior Open at Scioto Country Club in Columbus, Ohio. Originally designed by Donald Ross, the course opened in 1916. It went on to host the

1926 U.S. Open, Bobby Jones’ fifth major victory, the 1986 U.S. Senior Open, and it’s where Jack Nicklaus learned to play golf.

Under the leadership of Superintendent Bob Becker, General Manager Greg Wolf, Golf Professional Bill Stine and the members, the club worked diligently to produce a successful U.S. Senior Open. Over the last 10 to 12 years, renovation of the clubhouse produced a magnificent and functional structure. The course itself was renovated by the combined efforts of Michael Hurdzan, Ph.D., and Jack Nicklaus.

Additional numerous individuals — too many to name — focused on the goal of presenting Scioto CC and the Championship in the best possible light. That focus never wavered, even when a rain delay pushed the final round to Monday.

Following the tournament, accolades were directed toward the individuals who lead the effort. In the case of Becker, Wolfe and Stine, I know they appreciated the kind words, and at the same time they did not expect them. The staff and volunteers proudly accepted acknowledgement of their efforts through the recognition that the three received.

Not all of us can host a professional or major tournament. However, the desire to achieve a common goal is important, not just to today’s golf environment, but also to your well-being. Instilling a team culture in your crew and colleagues while a creating a common goal of the best golfing experience at your facility creates an exciting and highly motivational workplace. The idea that we are in this together for a single purpose is an extremely powerful statement about yourself and your commitment to the common good.

The biggest roadblock to a focused common goal is yourself. Worrying about things you can’t control is a major culprit. This type of angst not only diverts you from what you are trying to achieve, but permeates your staff, resulting in the real goal becoming lost. At some point you need to accept and trust those who are managing the things outside of your control.

Whether you are at a small golf operation or are conducting a major championship, clearly knowing the goal of the golf facility is similar to the goal of the Thunderbirds. The pilots are the best this country has to offer, yet I can’t name one pilot or any of the thousands who have been involved with the elite group. I do know they represent the best of the Air Force and those who keep them flying.

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).

# LEAVING A PATH OF DESTRUCTION

## ANNUAL BLUEGRASS WEEVIL ON THE MOVE

**T**he annual bluegrass weevil (*Listronotus maculicollis*), or ABW, is on the move. What was once a pest specific to the Northeast now has superintendents as far south as North Carolina and west into Ohio anxious that their course could be next.

This turf-destroying insect feeds primarily on *Poa annua* (annual bluegrass), a variety common to golf courses in this part of the country. ABW adults overwinter in protected areas around the course, including tree litter, brush and roughs. In spring, they emerge and migrate to shorter turf (fairways, collars, greens and tees), where they lay eggs between the sheath and stem; the larvae develop and then feed.

The first to third instars are stem borers, moving between turf blades to feed and complete their development. The fourth and fifth instars are more damaging, as they move outside of the plant and forage on the turf crown, killing the plant in the process.

**“We were able to apply MatchPoint during a time that worked for our schedule, and we didn’t have to worry about watering it in immediately.”**

— Scott Wunder,  
Piney Branch Golf Club

Scott Wunder, golf course superintendent and general manager at Piney Branch Golf Club in Upperco, Maryland, has been battling ABW since 2005, and this year is no exception. The unseasonably warm spring and summer, mixed with excessive humidity, created an ideal breeding ground for ABW.

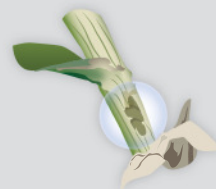
“This May, we put down MatchPoint insecticide for our first application of the season,” he says.

“We were able to apply MatchPoint during a time that worked for our schedule, and we didn’t have to worry about watering it in immediately.”

MatchPoint™ insecticide is an innovative solution for ABW control. Created using an advanced lignin formulation, MatchPoint offers enhanced photostability, giving

superintendents more application flexibility, as watering can be delayed up to 24 hours. When applied according to label directions, MatchPoint controls the first to fifth instar larvae and stops ABW feeding immediately.

“We typically make up to six ABW applications each year,” Wunder says.



### FIRST TO THIRD INSTAR

**LARVAE** are stem borers. They move between the turf plants to feed and complete development, turning the plant brown.



### FOURTH AND FIFTH INSTAR

**LARVAE** are the most damaging. They feed on the external turf crown, killing the plant.

“This year I’m hoping to cut out at least one application after seeing the results with MatchPoint.”

For more, visit [DowProvesIt.com](http://DowProvesIt.com).



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# Preventing winter desiccation in creeping bentgrass

Bill Kreuser, Ph.D., is a turfgrass scientist at the University of Nebraska-Lincoln. One focus of his research is understanding and preventing winter injury of creeping bentgrass. You can reach Bill at [wkreuser2@unl.edu](mailto:wkreuser2@unl.edu) and on Twitter @UNLTurf for more information.

## Q Describe a “typical” winter in Nebraska.

Like most locations, there is no such thing as a “typical” Nebraska winter. In general, the change from a mild fall to a harsh winter usually happens over a day or two. Winter is characterized by periods of windy, bitterly cold, dry weather alternating with periods of windy, warm, in the 50s F, and dry weather.

## Q What have you learned in your research to prevent winter desiccation injury?

All of our research has been on creeping bentgrass (*Agrostis stolonifera*) greens and fairways. We learned that crown moisture content is directly linked to cold hardiness. Crown moisture of 50 percent to 60 percent is ideal, with 55 percent to 60 percent the sweet spot. Above 60 percent crown moisture and the plants become more susceptible to death from crown hydration when the cells in the crown take up water during a warm period followed by a cold snap.

When crown moisture falls below 50 percent the plants become more sus-

ceptible to dying due to cold temperature, but with the catch that the plants die at a warmer temperature. To prevent turf loss due to winter desiccation, superintendents should be focused on preserving crown moisture.

## Q How do superintendents preserve crown moisture?

The most successful way to preserve crown moisture is to use what we term a physical approach, which is a permeable cover, an impermeable cover or a thick layer of sand topdressing. All of them worked well in our research. One word of caution

## WATERING DURING WINTER HELPS MAINTAIN CROWN MOISTURE AND IS A HELPFUL STRATEGY TO PREVENT TURF LOSS FROM WINTER DESICCATION.

is to remove the impermeable cover before it gets too hot in spring, or the turf can be damaged under the cover.

Chemical approaches we tested were mineral oil, green pigments, wetting agents and anti-transpirants, none of which

were effective in preserving crown moisture and preventing winter injury during Nebraska’s harsh winters.

## Q What about watering, especially during the winter?

Superintendents should water into late October and early November to maintain crown moisture in the 55-60 percent range so the turf goes into winter healthy and properly hydrated. In some cases, superintendents blow out their irrigation system too early in fall and the turf suffers from a lack of water. The tradeoff is blowing out too late, and the heads may freeze due to an early winter storm.

Watering during winter helps maintain crown moisture and is a helpful strategy to prevent turf loss from winter desiccation. The volume of irrigation water needed

to maintain crown moisture in winter is relatively small and should be in the range of 0.1 inch. For a frame of reference, roughly 60 gallons of water per 1,000 sq. ft. is equal to 0.1 inch of water.

How frequently to water greens in winter is part of

the art of greenkeeping. We have not been able to develop any reliable prediction models to help determine if water is needed.

It is possible to overwater in the winter, which can lead to turf loss from crown hydration. Keep in mind your goal is to provide a small amount of water to wet the canopy so the cells in crown stay properly hydrated. You are not watering for the root system.

## Q Anything else you would like to add?

During our research to understand crown moisture content in winter, a great deal of turf was lost. We used the dead turf to learn about turf recovery methods following winterkill. From the turf recovery research, we learned that clear or white covers helped speed up recovery. There was a considerable amount of recovery from the surviving creeping bentgrass plants, but it took a long time, until mid-July and without traffic stress, so seeding is essential following turf loss due to winter desiccation. Nitrogen applied at 0.1 lbs. nitrogen per 1,000 sq. ft. per week was ample fertilizer to promote recovery.



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

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# A VEHICLE DESIGNED BY SUPERINTENDENTS

## A TEST DRIVE OF THE NEW CUSHMAN HAULER

BY SETH JONES // Editor-in-Chief

I just got back from a trip to Augusta, Ga., where I was given a sneak preview of the new Cushman Hauler, from

### TEXTRON SPECIALIZED VEHICLES.

The new Hauler is built specifically with superintendents in mind. Of course, they're also hoping to sell these to a broad range of customers — from athletic fields groundskeepers to airports — but deep-dive conversations with superintendents (at places like the *Golfdom* Summit) is what spawned this new vehicle.

"If you can make the guy who spends eight to 10 hours a day in it happy, you'll make the guy who spends two

hours in it happy," said Matt Zaremba, director, Golf Product and Specialty for TSV.

Some of the things they considered: Does the driver slouch, or sit up straight? Does he carry an iPad or an iPhone with him? If he drives with a drink, does he need something that can hold a can? A can with a coozie? A Big Gulp? Or a coffee cup with a handle?

Or how about all of the above? Because that's what they built: A vehicle for the sloucher and the sit-up-straighter; the Big Gulp guzzler and the coozie carrier.

Zaremba said their were four key ideas they wanted to go for:

**Discreet** — Superintendents want to go unnoticed by golfers, so goodbye alloy wheels

**Versatile** — Superintendents want this vehicle to be able to complete every task expected of a utility vehicle

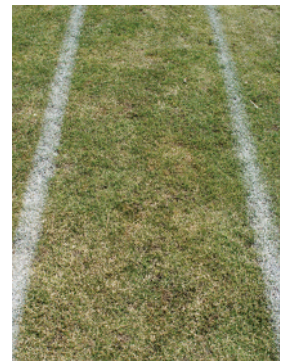
**Control** — Confident braking and safety was a must, hence the Intellibrake System

**Intuitive** — Anybody can use it, but few can abuse it

It stood out to me how much thought the team in the golf division of TSV put into the vehicle... from the net storage pocket behind the seats to the inclusion of 12V and USB outlets in the dash. [HaulerDemo.com](http://HaulerDemo.com)

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



## Alex J. Stuedemann

**SUPERINTENDENT** // TPC Deere Run, Moline, Ill.



**What can I get you?**  
I'll take a Fat Tire.

**Thanks for joining the magazine's editorial advisory board. Any advice for us?** The biggest thing is staying connected via all forms of media... social media, print media, networking. I think *Golfdom* does very well on all of those, the social, the face-to-face and the print.

**Good advice. So how old is Sophia now, and what's she into these days?** She just turned 2, and she's into everything, but more than anything Mickey Mouse. I'm understanding why Disney is such a big company.

**You can go back in time and grab one item from your childhood bedroom. What is it?** It would be a little wooden rocking chair that my parents gave to me that I would like to give to Sophia. She's getting to that age where

she'll sit and read books.

**What are your sports teams?** Minnesota Wild and Minnesota Golden Gopher hockey.



**What's your recipe for a Starbucks Chai Latte?** Six-pumps, extra hot, no water. I'm far too addicted to it; I drink



it every day. When I worked in San Antonio there was a Starbucks in the hotel on the course. The girls at the Starbucks helped me out with that recipe so it would last 18 holes for my morning ride.

**Your car stereo's CD eject button breaks... what's the best case scenario CD that gets stuck in there?** "...And Justice for All," Metallica. I just saw them in concert in Minneapolis at the U.S. Bank Stadium.

**So you got to see Metallica in the new stadium before the Vikings even played a game there?**

First rock show at the Bank. They played the night after Luke Bryan, and the reviews made it very clear who broke the stadium in.

**What's your secret to success?** My wife, Erin. She's got to be one of the most supportive wives of turf. I met her on the golf course, she was a server in the restaurant. Without her I can't come to work with the positive attitude I have and go home at night looking forward to going home. I can love both sides of my life because of her.

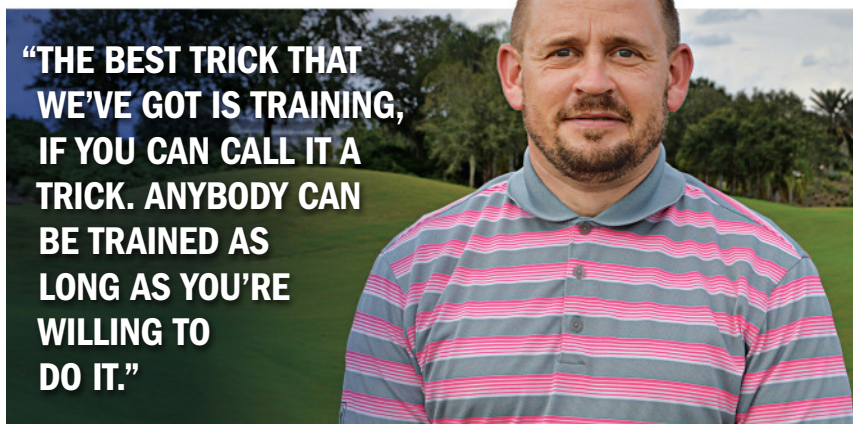
**If you could snap your fingers and one maintenance challenge was gone, what would you eliminate?** The first tee time, 7 a.m. It always seems we're outrunning it.

**Best excuse you've ever heard for missing work?** That the schedule we had just didn't work for the individual.

**Who would play you in a movie?** My wife requests it be Matt Damon so she could go out on a date with him.

**You hit Powerball. What would you buy for yourself?** A bigger garage. I'd have enough room to park my truck, have a workshop and a place to put all the kid toys.

As interviewed by Seth Jones, Aug. 29, 2016.



**"THE BEST TRICK THAT WE'VE GOT IS TRAINING, IF YOU CAN CALL IT A TRICK. ANYBODY CAN BE TRAINED AS LONG AS YOU'RE WILLING TO DO IT."**

MAIN PHOTO BY: PETE SELTZER

# POGO helps these supers achieve consistently high-performing turf.



POGO is easily one of the best value for money investments I have ever made—they have paid for themselves already! I can see it assisting in achieving huge water savings over time. The POGO is now a must have tool for all supers in my opinion.

*Sean Kinsley, The Address Montgomerie Dubai, UAE*

When the best decision is not made, it can be costly. Using POGO removes any guesswork—I know exactly what's going on when it comes to managing moisture, salts and fertilizer. POGO is my most valuable resource in my daily operations.

*Dario Pascua, Club Course, The Polo Club of Boca Raton*



POGO has given us the ability to apply exactly what's required on every individual green. We're able to forecast, plan and prepare so much better and our greens have never been more consistent.

*Craig Haldane, Director of Golf Course Maintenance, Dubai Golf*

I've used the other tools on the market, but POGO gives more information with greater accuracy, and it's more useful because it does the analysis for you. It's had a huge impact on how well we can manage our course.

*Kurt Beatty, Green Brook Country Club, North Caldwell, New Jersey*



The POGO is an incredible tool. I can takes samples then print out a visual map of each green for my staff so they know exactly where to hand water and where not to. It gives me moisture and EC correlations so I can manage my greens better.

*Ken Lochridge, Glen Head Country Club, Long Island, New York*

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