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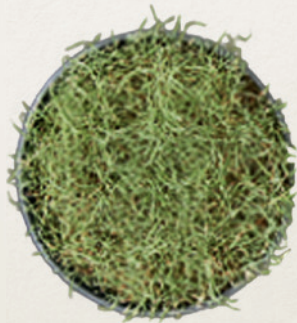
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Whistling TAKES ITS TURN *Straits*

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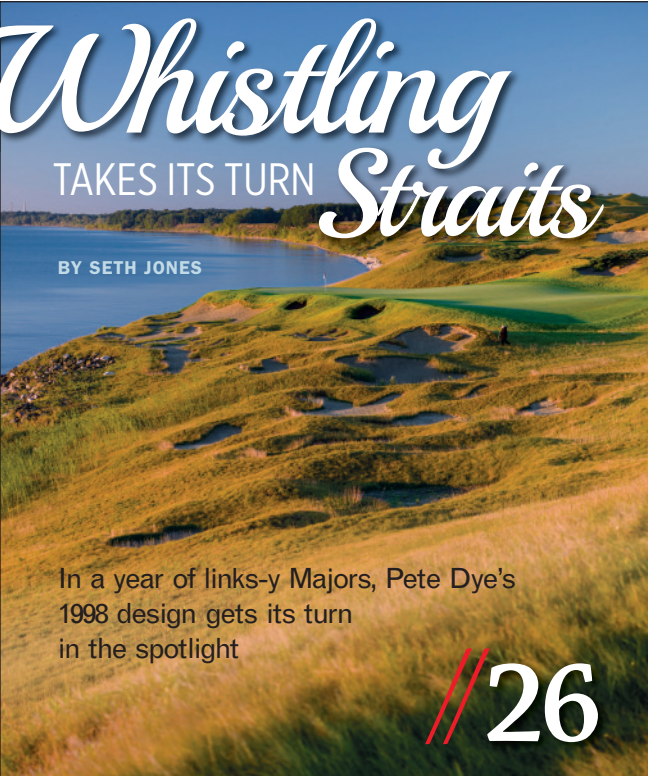
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Whistling Straits

TAKES ITS TURN

BY SETH JONES

In a year of links-y Majors, Pete Dye's 1998 design gets its turn in the spotlight

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Top tips for surviving summer



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“Have the conditions of the U.S. Open — and with it, the talk of ‘sustainability’ and reducing the game’s inputs — become a bigger conversation piece at the 19th hole than the conditions of Augusta National in April?”

SETH JONES, *Editor-in-Chief*

U.S. Open talk takes over

I walked into the office of Mike Amyx, the mayor of Lawrence, Kan., recently. He wanted to talk about the U.S. Open. ¶ As soon as I opened the door, Mike shot me a look and asked, “What the heck was going on at that U.S. Open?” I could tell he had been looking for me so he could get some intel from his “inside man.” But my need for a \$9 haircut was able to last a full week after the U.S. Open’s conclusion.

Clarification: Mike Amyx’s office is a barbershop. Mike is my longtime barber. And yes, he is also the mayor of Lawrence.

Usually we wait until I sit down to start the sports chatter, and typically we start off with his inside scoop on Kansas University basketball or football before we get into professional golf. But I hoisted my 3-year-old son Boyd into his chair and answered Mike’s questions to the best of my abilities.

Were you there? Yes.

Did it look like that in person? No, it looked even better.

What happened to the greens? The U.S. Open!

After a few minutes it

occurred to me that Mike’s questions weren’t only for his own curiosity. He was gathering insight to share with his next dozen clients.

“I know a guy who works in the business,” maybe Mike would say shortly after I left, “and he says...”

How many of your golfers, members, friends, neighbors, neighbors’ friends, etc., have cornered you recently with these same questions? I know this is the case because I’ve heard it from you guys firsthand — several of you have even resorted to calling me, asking me questions like Mike the barber/mayor, to add in a little eyewitness insight.

Yes, turf pros around the country are being asked their expert opinions by people who previously had only a fleeting interest in their work. So what answer are you giving? By now, have you had so much practice that your response feels rehearsed? Do you feel like a politician?

Well, guess what? Like Mike, you are a politician. And your constituency is the golfing public. Maybe some of the things you’re saying to them includes:

- The USGA is embracing “brown is beautiful.” Whether you like the look of it or not, fewer inputs are the future for many courses.
- The greens caught a lot of

grief, but every player had to play them.

- The U.S. Open is not the Masters.

There is so much said every April about “Augusta Syndrome” and the pressure that the Masters puts on superintendents across the country. Now, in late June, we’re talking about a mottled brown public golf course in the Pacific Northwest. But it was in the May issue that I quoted Chambers Bay Superintendent Josh Lewis saying, “Golf isn’t played on a color, it’s played on a surface.”

Has the look of the U.S. Open — and with it, the talk of “sustainability” and reducing the game’s inputs — become a bigger conversation piece at the 19th hole than the conditions of Augusta National in April? And if so... how awesome is that?

Boyd wasn’t quite done with his haircut when Mike ran out of questions and summed up his take on the U.S. Open for me. First he talked about how beautiful the course looked in *Sports Illustrated*. Then he really got going.

“You know what? I liked watching that tournament. I liked watching those guys struggle!” Mike told me. “Every one of those guys had to putt the same greens. And Jordan Spieth... he didn’t just beat the field, he beat that course. He won that thing.”

Turns out Mike really didn’t need an inside man at all.

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Starter

NEWS, NOTES AND QUOTES



USGA Greens Section staff and volunteers discuss No. 16 green the day before play in the U.S. Open begins.

// 2015 U.S. OPEN



// FROM SUPER TO SALES

FLORATINE NAMES RAMINA CORPORATE AGRONOMIST

Floratine has appointed Paul Ramina as its new corporate agronomist.

Ramina joins Floratine after more than 20 years as a superintendent. During his tenure, Ramina delivered tournament-level course conditions for several U.S. golf courses and hosted four PGA Tour events and five LPGA events.

Ramina holds a degree in golf course management from the Institute of Applied Agriculture at the University of Maryland.

"I'm excited to visit peers and 'give back' through sharing my experiences with the Floratine line and the proven results they bring to turfgrass professionals," Ramina said.

As Corporate Agronomist, Ramina will be working with customers to evaluate their turfgrass and soil conditions to help them develop the most optimal nutrition programs available.



Paul Ramina

MEAN TO GREENS

BY SETH JONES // Editor-in-Chief

➔ Jordan Spieth won the 2015 U.S. Open at Chambers Bay in a dramatic finish.

Everything else, it seems, is up for debate.

Gary Player did everything but flip over a table in a rant on the Golf Channel, calling the 2015 U.S. Open, "the most unpleasant golf tournament I've seen in my life." He went on to blame the course for everything from husbands and wives arguing at home to causing people to fall over or become lost. (But bonus Scrabble points for using *indigenous* without a blink.)

Billy Horschel found himself apologizing for his actions on the course after the tournament. The 2014 FedEx Cup Champion was shown on TV apparently slamming his putter into the No. 6 green out of frustration with the putting surface. A well- (or ill-, depending on perspective) timed Fox graphic covered the actual impact. Horschel apologized on Twitter afterward and insisted he didn't actually slam his put-

ter but only pretended to.

But yet he didn't stop slamming the greens.

"There's obviously an issue with the greens, and I don't know if (USGA Executive Director Mike Davis) is just trying to sugarcoat it so it doesn't look bad," Horschel said.

Golfdom asked both Eric Johnson, Chambers Bay director of agronomy, and Darin Bevard, the USGA's director of championship agronomy, about the complaints early in the week.

"(The greens) look terrible, visually. But the bottom line is, the ball's not bouncing," Johnson said. Bevard's response: "I think for fescue greens, they're just about perfect."

Whatever the story, maybe Tony Nysse, superintendent at Old Marsh Golf Club in Palm Beach Gardens, Fla., said it best in a tweet to *Golfweek* senior writer Bradley S. Klein: "Can you finally let this go? Some misinformation on many fronts. We got a great winner, great drama. The end."

// LEGENDS NEVER DIE

TURF PIONEER TROLL PASSES

Joseph Troll, Ph.D., a 40-year turfgrass educator and pioneer, passed away on June 14 at the age of 95.

Troll joined the department of plant and soil sciences at UMass in 1957 as an instructor and was promoted to professor in 1959. He taught turf management at the Stockbridge School of Agriculture at the University of Massachusetts.

"This week the turf world lost a friend, a great professor and mentor of mentors," the UMass Alumni Turf Group Website stated. "Joseph Troll left an indelible mark on the turf industry."

He received the Distinguished Service Award in 1983 from the Golf Course Superintendents Association of America. In 1991, Troll was honored with the USGA Greens Section award in recognition of his distinguished service to golf through his work with turfgrass.

// YOUNG GUNS

Jacobsen seminar focuses on the future

➔ Jacobsen recently hosted 22 hand-picked turf students at its Charlotte, N.C., headquarters. Students recommended by their respective turf professors were given a tour of both Jacobsen's U.S. headquarters as well as the company's manufacturing facility.

Students were also treated to tours of Sage Valley Golf Club's maintenance facility, the University of South Carolina's baseball stadium and a ride and drive at the Peninsula Club. Speakers at the event included Sage Valley Superinten-



Creighton Sloan, a student at Central Piedmont Community College in Charlotte, N.C., is trained on a Jacobsen GP400.

dent Chuck Green, University of South Carolina Sports Turf Manager Clark Cox, Rock Ridge CC Superintendent Steve Loughran, The Peninsula Club Superintendent Jared Nemitz and *Golfdom's* Seth Jones.

The Jacobsen Future Turf Managers Seminar has been introducing students

to Jacobsen equipment and professionals in the industry for more than 30 years.

"It was definitely a worthwhile experience, learning from the professionals who spoke," said Colton Metzger, a graduate student at Iowa State University. "It was also great meeting the fellow participants who are now new contacts."

// DEERE DOWN SOUTH

JOHN DEERE SHOWS OFF AT PURSELL FARMS

➔ John Deere recently invited *Golfdom* to join a group of superintendents and sports turf groundskeepers at the 3,500-acre "playground" for superintendents, Pursell Farms in Sylacauga, Ala.

The turf professionals were able to try out John Deere's A-model fairway,

greens and terrain mowers as well as its tractors. John Deere product managers and sales managers answered questions from the attendees. "Take some chances" was the message delivered by Mark Langner, Farm Links Golf Course's director of agronomy, to those about to

experiment with the machinery.

"When the superintendents come in I don't feel like I have to set up a bunch of barriers for them," Langner told *Golfdom*. "If they don't take the opportunity to take a machine through its paces they don't get a good understanding of what it can do."

Robert Podleski, assistant superintendent at Farmington CC, Charlottesville, Va., said they use a competitor's equipment at his course, which made him even more interested to see how the green gear worked.

"I'm looking at the equipment from an operations standpoint. The key for me is, can I teach a guy to use it quickly," Podleski said.

For more information on John Deere's event at Pursell Farms, visit Golfdom.com



Turf pros learn more about the John Deere 7400A TerrainCut Trim & Surrounds mowers at Pursell Farms.

PHOTOS BY: SETH JONES (TOP) / GRANT B. GANNON (RIGHT)

Golfdom Gallery

 **U.S. OPEN**
EDITION



1

1 Walk the line Danny Vandecoevering, Charbonneau GC, Wilsonville, Ore., keeps a straight line as he mows No. 17 green at Chambers Bay.



2

2 Greetings from beautiful Washington State Dave Oatis, USGA Northeast Regional Director, and Kimberly Erusha, Ph.D., USGA Green Section Managing Director, may be northerners, but they look at home in the Pacific Northwest, too.



3

3 He's got a point Mike Davis, executive director of the USGA, stopped by the maintenance facility on the Sunday afternoon before the tournament to greet the 170 men and women ready to maintain the course. For a full transcript of Davis' talk, visit Golfdom.com/blog.



4

4 The big train is coming Kabe Hockema, a student at Oregon State University, grapples with a quick coupler while a train of mowers (see photo 8) heads his way.



5

5 Busy Beavers (L to R) Micah Woods, Ph.D., chief scientist at the Asian Turfgrass Center, Eric Johnson, director of agronomy at Chambers Bay and Tom Huesgen, CGCS at Sahalee CC, Sammamish, Wash., were classmates at Oregon State University.



6

6 Poster boy J.C. Childree is the superintendent of the Nicklaus Course at The Club at Carlton Woods, in The Woodlands, Texas. He's also the subject of that USGA poster he's looking at — that's him visiting with USGA Senior Agronomist Chris Hartwiger.



7

7 What's cookin'? It was Italian meatballs on this day at the maintenance volunteer tent.

Continued on page 12

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PHOTOS BY: SETH JONES (1-5, 7); TIM HUBER (6)

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Golfdom Gallery

 U.S. OPEN
EDITION

Continued from page 10

8 Mower madness A train of Toro fairway mowers almost as far as the eye can see take care of a fairway in one fell swoop at the 2015 U.S. Open.



9 They see me rollin' Akoni Ganir, Winchester CC, Meadow Vista, Calif., not only had the coolest name on the grounds crew, he also knew how to make rolling look good.



10 Why are these guys smiling? (L to R) The Toro Co.'s Jamie Bergen, Chambers Bay equipment manager Jerry Holcomb and Toro's Boyd Montgomery and Jim Heinze smile in a temporary tent constructed to shelter all that red equipment they love at Chambers Bay.



11 Oregon State Alumni party Or at least that's what it felt like at times at Chambers Bay. All the Oregon State crew members — both grads and current students — assembled for a team photo in their favorite color, orange.



12 They scream for ice cream There was some, uh, debate between Marcus Lakey, Bandon Dunes Golf Resort, Bandon, Ore., and Jeff Stephenson, Tokatee GC, Eugene, Ore., on who actually owned that ice cream cone. Judging by this photo, Lakey won the debate.



13 No autographs, please J.C. Childree (center) encouraged co-worker Tim Huber (L) of The Club at Carlton Woods in The Woodlands, Texas, and Scot Dey (R), Mission Viejo (Calif.) CC, to smile big for this photo. After all, images of him have been known to grace posters at major sporting events (photo 6).



14 Hang loose How chill is this bunker raking crew? Cool enough to look into the morning sun for a cool photo.



PHOTOS BY: SETH JONES

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“Golf is no longer just what those of us involved in the game in the traditional sense grew up with and worked at for years.”

MARK WOODWARD, *Contributing Editor*

What is golf?

When I was a kid, golf meant just one thing: golf. There was only one kind of golf. What I mean to say is golf was golf. There was only one definition of the game.

¶ Back then, it only involved using a club (a golf club) to hit a white ball (a golf ball) from a relatively flat area of turf (a tee) down a wide expanse of turfgrass (a fairway or rough) toward a relatively circular area of turfgrass (a green) that had a hole and pole with a flag on it, all of which collectively was known as a golf course.

The intent was to hit the ball using the fewest amount of strokes into that hole, which was 4 and a quarter inches in diameter and had in it a cup.

Don't get me wrong, the definition of golf above is still the game that those of us in the traditional golf business know all too well. We've spent our entire careers frustrating golfers by improving the condition and maintenance levels of the aforementioned golf course. And as we all know, the only thing that hasn't improved in our industry over many years is the golfers' abilities.

However, to others in today's world, golf means so much more.

I'm involved in managing a

golf course that is on the verge of implementing FootGolf, in which the players kick a soccer ball into a hole that's 21 inches in diameter. This game is played on the same golf course that traditional golfers use. The theory is to expose new golfers to a new game, get them to the golf course, and eventually transition them to traditional golf. Along the way, you generate more revenues for the facility (FootGolf fees, increased food/beverage, merchandise sales, etc.)

And now there is TopGolf, which is a multi-tiered facility that looks from the outside much like a traditional practice facility found at a traditional golf course. Except it is so much more. With TopGolf, microchip technology resides

inside the golf balls, which are hit at several targets with real golf clubs. But that's not the full story. The main reason TopGolf has been so successful is that it is exposing a whole new segment of our society to a game that, while not traditional golf in the terms described above, is nonetheless exposing people to golf in an extremely non-traditional way.

TopGolf is amazingly popular with Millennials (ages 18-30) because it makes golf fun for them. With TVs, a party atmosphere, alcohol, live music, meeting space, etc., it has become a social destination to go to as much for food/beverage and social interaction as for hitting golf balls. But the bottom line is

that these venues are golf complexes that have proven to be incredibly successful.

The other day I was at my cabin in northeastern Arizona, and my wife and I were walking our dog when we saw a bunch of people walking around in the forest among the pine trees. On closer inspection, these people appeared to be throwing something at the trees. You've probably guessed it; they were playing Disc Golf, and it wasn't the trees they were aiming at. It was raised baskets on a pole that serve as the green/hole for the game.

I don't have space to talk about night golf, video golf, golf with 15-inch holes and other variations of non-traditional golf that are attracting people.

Golf is no longer just what those of us involved in the game in the traditional sense grew up with and worked at for years. It can mean something different to different people. Today there are so many choices for people (particularly young people) in how they spend their time and discretionary income.

Golf is so much more than what I described at the start of this column. If you asked a cross-section of society the question "What is golf?" you'd get a lot more answers compared to when I was a kid.

I'm getting old.

Mark Woodward is a senior vice president for OB Sports, principal of Damarco Golf, president of Mark Woodward and Associates and a contributing editor for *Golfdom*. He can be reached at mwoodward@obsports.com.



“Superintendent chapters have embraced charities, programs and foundations that support people in need. Some events have been in place for a couple of decades.”

JOEL JACKSON, *Senior Contributing Editor*

Golf Day reflections

Back in April during National Golf Day, the annual GCSAA-organized trip to Washington, D.C., our delegation reminded legislators that the U.S. golf industry generates \$70 billion in economic impact annually, employs close to 2 million Americans and generates nearly \$4 billion in charitable giving each year.

The first two items get a lot of attention because they affect the economy (wages, spending, taxes, etc.). The third item, “charitable giving,” jumped out at me because it’s an increase over the previous figure of \$3.7 billion. Although a slight increase, it comes at a time when we are recovering from a period of economic slowdown.

From my years as executive director and magazine editor for the Florida GCSA, I know our 11 local chapters have annual fundraisers that support scholarships, turf research and charities. I know because I have been there to see the check presentations and hear the comments of those receiving the support.

Another thing that made me think a little more about the national charitable giving component of the golf industry’s contributions is the tele-

vision coverage of golf tournaments. We have all seen the 3- to 4-minute segment where the announcer and the CEO of the tournament’s corporate sponsor talk about the local charity receiving a large donation from the proceeds of the event.

GCSAA superintendent chapters around the country also have events to raise money for local charities and other worthwhile programs. I reached out to all the GCSAA regional representatives and some of the chapter executive directors I have met over the years.

I don’t have enough space to recognize all of them in this column, but suffice it to say that we help make a difference in our communities. That is a good thing. Superintendent chapters have embraced charities, programs and foundations that support

people in need. Some events have been in place for a couple of decades. Two of these in Florida are South Florida GCSA’s Missing & Exploited Children’s Foundation tournament. They will have their 30th annual event this September, and have raised more than \$500,000 for this charity. Then there’s the Seven Rivers GCSA’s John Hayden Memorial Envirotron Classic, which is celebrating 26 years and has raised \$800,000 for turf research at the University of Florida.

Almost universally, chapters give money for student scholarships in two categories; children of members and turf students. The Michigan GCSA gives one to MSU students, and the Everglades GCSA hosts the G.C. Horn Endowment Tournament to fund a graduate student in honor of G.C. Horn, Ph.D., the grandfa-

ther of Florida’s turf program.

The Eastern Shore GCSA hosts an annual crab feast and pig roast with a silent auction to raise funds for Wounded Warriors and the Tomorrow’s Children Project. The Carolinas GCSA began the Rounds for Research program, which raised money annually for Clemson and N.C. State research. That program was adopted by the GCSAA to embrace all chapters and help fund projects of the Environmental Institute for Golf.

I first heard about the Wee One Foundation from my friends in the Wisconsin and Michigan chapters, and it has spread everywhere. Georgia GCSA Executive Director Tenia Workman says that chapter has just begun donating to the Wee One like so many have done already. Tenia also mentioned scholarships and the Golden Valley Foster Care programs.

Brian Cloud reported the annual charitable work done by the South Texas GCSA for Camp Hope, a place for wounded warriors to get treatment, housing and rehabilitation, and their support of the M. D. Anderson Cancer Center in Houston. The North Texas GCSA has been extremely active since 1999 in supporting the Scottish Rite Hospital in Dallas.

These are just snapshots of what chapters around the country are doing, but I think you get the big picture. Local chapters are valuable national assets.

Joel Jackson, CGCS-Ret., is senior contributing editor for *Golfdom*. Email him at flrjn@aol.com.

My Second Office

BECAUSE THE COURSE IS YOUR FIRST

About our host

The University of Georgia football team plays its games in Sanford Stadium “between the hedges,” but its golf teams know home as the Robert Trent Jones-designed UGA Golf Course in Athens, Ga. The manager of that home, Superintendent **SCOTT GRIFFITH**, allowed *Golfdom* to visit his office.

When we talked to Griffith, his course had just hosted the Georgia GCSA’s annual Bulldog Classic, which helps fund the association’s legacy scholarship for children of superintendents.

“We had some rain in the area and we only played seven holes of golf before we had to call it,” says Griffith. “It was good

to see everybody and everyone had a good time.”

Griffith’s office may seem plain on the surface, but answers to questions about the objects offer a rich history of his career and family. (If you want to hear a good story, ask him about his grandmother-in-law, who married three WWII Marines.)



“I usually have sunblock on my desk in plain sight to reassure my wife I am wearing it.”

1 FAMILY OORAH I was in the Marine Corps Reserves for 8 years and I have a long heritage of Marines in my family. My mom and dad were both Marines during Vietnam, and I have cousins who were, too. Then on my wife’s side, we have three other relatives who were Marines.

2 AAC ALUMNUS I spent four years as an assistant at the Atlanta Athletic Club. That plaque and flag were a gift from my old

boss, Ken Mangum, when I left to come to the University of Georgia Golf Course. I was able to spend quite a few hours there, considering I was there during the renovation of both courses.

3 PUZZLING ARTWORK It is actually not an art print, but a puzzle that my family and I put together. When we get together for the holidays we usually buy a puzzle and everyone chips in by putting some pieces on. This one, my

mother-in-law gave to me.

4 PIECE OF HISTORY That Rolodex is left over from about 3 or 4 years ago, but I’m the type of person that when I throw something away, I’m going to need it. I haven’t got the willpower to throw that thing in the trash.

5 HONORARY HEIFER I used to play in a foursome that included Dr. Jared Hoyle, who has since moved to Kansas State, and

we would go out and play nine holes. We had a format that was really fun, and one day Dr. Hoyle brought this old FFA trophy he had lying around. He made a new label for it that titled it “The UGA Golf Course Heifer Cup Champion.” Below in parentheses it says “The Bull**** Cup.”

WORDS BY GRANT B. GANNON // PHOTO BY SETH JONES
Proud of your second office? Email us a photo of you in it to sjones@northcoastmedia.net, and we may feature you and your office in an upcoming issue of *Golfdom*.

PLANT HEALTH

PART 3 OF A 3-PART SERIES

Golfdom is proud to once again partner with BASF Professional Turf & Ornamentals to bring readers the 3-part Plant Health Series. In this, the final part of the 2015 series, *Golfdom* Research Editor Clark Throssell, Ph.D., checks in with four expert turf pros from around the country to get their best tips on keeping turf healthy through the hot summer months.

As the temperatures continue to rise, your friends at *Golfdom* and BASF wish you the best in plant health this summer and beyond.

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BY JEFF VANNOY

How you and your turf can be stress-resistant

As a superintendent you don't always have control over what happens to your course, from the weather to unusually high traffic patterns. Fortunately, you do have the ability to boost how your turf responds to stress.

Let's start with a source of mechanical stress — aerification. As you know better than anyone, aerification is essential to your course's health.

Typically, you aerate your course at least twice a year to allow better oxygen and water penetration to the roots. However, in the short term your course may need to close or you may see reduced play as your greens recover from the stress of aerification.

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But what about other kinds of stress? Even drought stress conditions are no sweat. Greenhouse studies demonstrate that turfgrass

treated with **Insignia Intrinsic** brand fungicide or **Honor Intrinsic** brand fungicide withstands high heat and drought-like conditions. What's more, turfgrass quality remains high with no loss of growth in the canopy or the roots.



“So it's a worst-case scenario when we apply Lexicon Intrinsic brand fungicide in January. But every time we took the covers off, we felt that the greens just looked better.”

Intrinsic brand fungicides also demonstrate superior ability to safeguard turf from extreme temperatures as well as the impact of lower light conditions and shorter days. For courses with bermudagrass, Lexicon Intrinsic brand fungicide provides recuperative power from lower-than-average temperatures in the winter, enabling plants to maintain good color and

good canopy density.

John Jeffreys, superintendent at Pinehurst No. 2, has seen firsthand how Lexicon Intrinsic brand fungicide protects his warm-season greens through cold weather. “If you wanted to create a recipe for bad conditions on ultradwarf greens, you would put them in high shade, high moisture, little air movement,” he says. “So it's a worst-case scenario when we apply Lexicon Intrinsic brand fungicide in January. But every time we took the covers off, we felt that the greens just looked better.”

Choose from our line of Intrinsic brand fungicides, which through more than 10 years of research have been proven to optimize disease control resulting in enhanced growth efficiency and stress tolerance.

Now your turf can handle the stress, and so can you.

Jeff Vannoy is Senior Product Manager, BASF Professional Turf & Ornamentals.

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PLANT HEALTH

PART 3

Top tips for *surviving*

These tips from four industry experts can help superintendents beat the heat.

BY CLARK THROSSELL, PH.D.

Creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) putting greens experience some degree of heat stress nearly every summer. The amount of damage from heat stress varies each year because of the intensity and duration of hot weather. The damage can range from off-color turf to thinning of the turf to large areas of dead turf.



No. 2 at
Wichita CC

summer

The first symptoms of heat stress usually appear in combination with another stress, most commonly traffic stress. The first symptoms of combined heat and traffic stress are poor tolerance to golfer traffic around the cup and at points where traffic is confined to a single entry or exit point off the green. The effects of these stresses also show up as loss of turf density in the cleanup mower pass.

The underlying reason for turfgrass decline from heat stress in creeping bentgrass and annual bluegrass is the imbalance of photosynthesis and respiration. During summer when air temperatures are above 80 degrees, turfgrass plants consume more carbohydrates (energy) through respiration than they produce through photosynthesis. The higher the air temperature is above 80 degrees and the longer per day it remains above 80, the greater the degree of heat stress the turfgrass plant must endure.

Coping mechanisms to deal with heat stress include managing traffic patterns on greens, raising mowing heights, skipping mowing one or two days a week, alternating days of mowing and rolling, providing adequate water but not overwatering, providing sufficient nutrients and following a comprehensive preventive fungicide program to manage diseases.

While all these suggestions are sound agronomic practices and when properly implemented reduce damage from heat stress, superintendents and scientists use other techniques to help turfgrass survive the heat of summer. What follows are the tips and insights of four experts who nurse creeping bentgrass and annual bluegrass greens through long, hot summers year in and year out.

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Erik Ervin, Ph.D., VIRGINIA TECH

Make sure there is ample air in the pore spaces in the upper 2 inches of the rootzone, according to Erik Ervin, Ph.D., turfgrass scientist at Virginia Tech University.

“Air is less dense than water and therefore holds less heat than water,” Ervin says. “Maintaining air in the pore spaces in the upper portion of the rootzone will keep the rootzone cooler, helping the grass survive heat stress.” He adds that venting aerification with solid tines approximately ¼ inch diameter on 2-by-2 inch spacing to a depth of 3 or 4 inches every 2 or 3 weeks, weather permitting, is a big help in maintaining air in the pore space in the rootzone and thus improving drainage.

Avoiding wet — or even worse, saturated conditions in the upper portion of the rootzone improves turf performance during heat stress. Using a time domain reflectometry (TDR) instrument to measure soil moisture and continually monitor it helps superintendents achieve the proper balance of air and water in the upper 2 inches of the rootzone, Ervin says.



Erik Ervin

He adds that the routine use of soil surfactants helps to uniformly distribute water in the rootzone and move it more efficiently through the rootzone. Consider using fans to moderate temperature and dry out the rootzone. He also suggests avoiding or reducing the use of DMI fungicides, Cutless (flurprimidol) and Trimit (paclobutrazol) on annual bluegrass because it can be sensitive to these products, particularly during periods of heat stress.

Jim Kerns, Ph.D., N.C. STATE

The diagnostic lab at North Carolina State University is busiest during hot, dry summers, according to Jim Kerns, Ph.D., turfgrass pathologist at N.C. State. That’s because a greater range

of problems occur during hot, dry weather. These problems include heat, drought and traffic stresses along with nematodes and diseases, as opposed to primarily disease problems during hot, wet summers.

Kerns recommends submitting a turfgrass sample for diagnosis at the first sign of a problem. “Most people wait too long to submit a sample for diagnosis, and by the time we determine the problem it is often too late for the corrective measures to be effective,” he says.



Jim Kerns

He also suggests following a fungicide application program every 2 weeks, tank mixing a contact and systemic fungicide or a tank mix of a contact fungicide and a phosphite product. For contact fungicides he suggests mancozeb, chlorothalonil or fluazinam. Like Ervin, he supports avoiding the use of DMI fungicides during hot weather.

Other cultural practices should include spoon feeding with nitrogen, he emphasizes, because, “low nitrogen fertility leads to more problems.” Also continue to needle-tine aerify and topdress unless temperatures are extremely high.

And while not mowing one day a week or on alternating days or mowing with rolling are well-known steps to reduce the impact of heat stress while maintaining acceptable putting green speed, Kerns notes that many superintendents are reluctant to implement these practices.

Jeff Sexton, EVANSVILLE COUNTRY CLUB

Keeping the rootzone on the dry side tops the list of tips from Jeff Sexton, superintendent at Evansville (Ind.) Country Club. Located on the Ohio River, Evansville’s summers are hot, humid and long. To achieve his goal of a rootzone with adequate, not excessive, soil moisture, Sexton and his staff primarily hand water greens during hot weather,

Continued on page 24



The routine use of soil surfactants helps to distribute water in the rootzone and move it more efficiently through the rootzone.

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John Jeffreys

Superintendent, Pinehurst No. 2
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“Sexton believes he has reduced the amount of water applied to the greens ‘by about 25 percent’ by using the soil moisture meter.”

Continued from page 22

focusing on the collars and outside portion of the green and syringing two or three times a day during hot weather.

Sexton uses a soil moisture meter every day on all 18 greens. Through routine monitoring and experience he has determined a threshold at which he needs to irrigate greens using the irrigation system. Sexton believes he has reduced the amount of water applied to the greens “by about 25 percent” by using the soil moisture meter.

Sexton manages 13 greens with a sand-based rootzone and seven greens with a soil-based rootzone. He’s found that regular applications of wetting agents move water through both rootzones more effectively, helping achieve his goal of having adequate water in the rootzone.

When air temperatures reach the mid-90s, Sexton starts to “play defense,” focusing on the survival of the grass. During these periods of extremely high temperatures he alternates days of mowing and rolling greens. His play-defense strategy has been helped by a slight increase in mowing height the last couple of years. While continuing to “play defense,” Sexton aerifies with 3/8-inch solid tines twice a month and topdresses lightly each week except during long periods of extremely hot weather.

Brian White, WICHITA COUNTRY CLUB

For Brian White, superintendent at Wichita

(Kan.) Country Club, helping his 65-year-old creeping bentgrass/*Poa annua* greens through a tough Kansas summer begins with sound water management. He and his staff monitor soil moisture every morning using a soil moisture meter, focusing their attention on both wet and dry areas. They hand water only those areas requiring water. With the exception of using the irrigation heads to water in products applied to the greens, White relies on hand watering during the summer.

To take advantage of the Kansas wind, of which there is plenty, White and his staff have



Brian White

opened corridors in the trees surrounding the putting greens to provide good air movement across the green surfaces. In addition, White applies wetting agents on a regular schedule to move water more effectively into and through the rootzone.

“Everything in moderation” is White’s guiding principle on other management practices during periods of heat stress. He spoonfeeds nutrients, applies Primo (trinexapac-ethyl), vents greens every 2 to 3 weeks and topdresses lightly every week during summer, but keeps a close eye on the forecast and adjusts when extremely hot weather occurs.

“Be observant” is another principle White follows and imparts to his staff. They spend time on each green every morning and afternoon. “It is amazing how fast a green can get away from you if you aren’t out there every day looking at it,” he notes.


With superintendents facing the prospect of a long, hot summer, these golf course experts hope a few of these strategies and tips can help greens beat the heat. **G**

Clark Throssell, Ph.D., is a turfgrass scientist and research editor for *Golfdom*. He provides research and educational expertise to the golf industry. He helps solve agronomic problems and teaches seminars to golf industry professionals. Throssell can be reached at clarkthrossell@bresnan.net for more information.



No. 15 approach at Evansville (Ind.) CC, where Jeff Sexton is the superintendent.

PHOTO COURTESY: EVANSVILLE CC



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TM

Whistling TAKES ITS TURN Straits

In a year of links-y Majors, Pete Dye's 1998 design gets its turn in the spotlight

No. 3, "O'Man," is a 183-yard par 3.

BY SETH JONES

With the first three Majors of 2015 in the rearview, all eyes now look to the final Major of the year, at the Straits Course at Whistling Straits in Kohler, Wis.

Excluding the Masters, 2015's Majors have had links-style golf in common (*and possibly Jordan Spieth winning as another commonality. Golfdom went to press before the conclusion of the Open Championship.*) Chambers Bay, only 8 years old, added in the twist of major elevation changes but otherwise was a links-style course. St. Andrews, "the

Home of Golf," has defined that style of course. And now, the Straits Course at Whistling Straits, designed by Pete Dye and opened in 1998, again celebrates that style of golf while hosting its third PGA Championship.

"I think it reflects a shift in architecture and design in some new courses that have been built. You've got Chambers Bay, Erin Hills, Bandon Dunes... When we opened in

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“THEY ARE DEDICATED TO MY COURSE, MY EQUIPMENT, MY TEAM.”

A superintendent discusses his switch to John Deere Golf

Tradition is rooted deep in Alabama, the “Heart of Dixie” state, so when Owen Coulson, Vestavia Country Club superintendent, sought new turf management equipment, breaking tradition required thorough research. “I was apprehensive about changing equipment,” said Coulson, who has been a superintendent with Vestavia for 11 years. “For me to make a change, I needed to find a significant differentiating factor.”

Like all decisions to invest in new equipment, many variables are in play including trust, durability, price and customer service. For Coulson, the dealer relationship and price were the primary factors as he approached his decision.

Coulson began contacting his peers for referrals to an equipment dealer that was committed to post-purchase service.

During his research, Coulson kept hearing positive comments about Greenville Turf and Tractor – a full line John Deere dealer with multiple locations in the southeast. “Greenville’s

name kept coming up. The more I heard the more I became comfortable about making a switch to John Deere, knowing that the product was great and I had a dealer that would be able to provide the service I expect.”

Price was the other obvious factor for Coulson. “The pricing was where I needed it to be, considering

“Greenville’s name kept coming up and the more I heard the more I became comfortable about making a switch to John Deere...”

the additional rebate I received through our VGM Club membership. The quotes were similar as far as price was concerned, and then you throw in the rebate check from VGM and that was a big deciding factor - it tipped the scales and made it easier to differentiate John Deere from the others.”

Post-purchase service proved to be another driving force for Coulson to renew his lease through Greenville Turf and Tractor. “The relationship has been great. They make themselves available.”

As Coulson pointed towards the window of his office he continued. “Prime example: their mobile mechanic is under our Gator working with my team on installing a sprayer right now. They are dedicated to my course, my equipment and my team. That level of service puts me at ease.”

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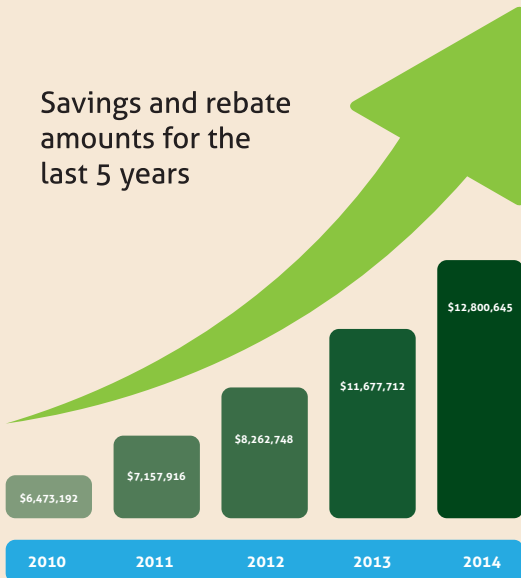
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"I wonder if superintendents don't really understand the benefit of VGM like club managers do. The membership is a benefit to superintendents when purchasing everything from turf equipment to smaller items like flags and cups."

Owen Couson, Superintendent
Vestavia Country Club, Birmingham, AL

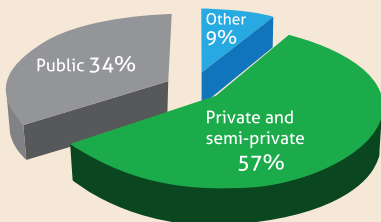
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Chris Zugel oversees a crew working on bunker drainage in May. Many of the bunkers washed out in 2010 after almost 2 inches of rain fell on the course the day before the tournament started. “We want them to take an inch or 2 of rain without needing to be pumped,” Senior Assistant Superintendent Joe Sell says.



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'98, (American links-style golf) was a rarity,” says Superintendent Chris Zugel, CGCS. “The word people put upon these courses is ‘sustainability.’ Sure, they are designed to use less water and other inputs through the addition of more native rough areas, but that’s not necessarily the intent of these courses. Less inputs is a win-win for golfers and management.”

So what does the style of Whistling Straits stand for?

“Fun. You don’t have to hit it a mile,” Zugel says. “You can bump it down a fairway. You don’t have to hit that 270-yard drive. You can hit a 150-yard drive 10 feet off the ground and let it roll. That’s where the fun comes in. We’re trying to get that element of excitement back in the game. And just like those other courses, we’re walking only — it’s a good way to experience the game and get out there with friends and family.”

Better bunkers

This will be the third PGA Championship for Zugel and Michael J. Lee, CGCS, manager of golf course maintenance. (Lee happily stood aside for Zugel to grace this month’s cover, as he has opted

to take the mainstream media requests while passing all industry media requests on to Zugel. “I’m up to my ears in media requests,” Lee sighs.) This will be Senior Assistant Superintendent Joe Sell’s second PGA Championship, having worked at the course for 10 years.

The 2010 PGA Championship was a “fire drill” for the crew. A month of dry weather prior to the tournament was interrupted by 2 inches of rain on the Wednesday morning before the start of the tournament.

At a course known for its numerous bunkers, that meant the squeegees, shovels and pumps were the firefighter’s tools of choice. With that experience in their back pocket, the crew stands ready for just about anything.

“We were prepared, and if we learned anything, it was that you can’t over-prepare,” Zugel says of the rain in 2010. “We had a lot of bunkers wash out. It was brutal for our guys. But the fire drill we had in 2010 has prepared us in that we know we can do it... we just have to stay on our toes.”

Sell says that as soon as Martin Kaymer won in a playoff over

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// WHISTLING STRAITS

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Bubba Watson in 2010, work began for the 2015 PGA. On most days, a crew is seen working diligently on one of the course's myriad bunkers.

"We want (the bunkers) to be able to take an inch or 2 of rain without needing to be pumped," Sell says. "So mostly we started fixing (bunker) drainage issues — making sure the water is getting into the tiles, that the access routes to the drains are in there correctly, that there aren't any rocks impeding the flow."

A common conversation piece for caddies — especially after a golfer finds the 6-foot-deep greenside bunker on No. 6, Gremlin's Ear — is the number of bunkers on the course. Numbers vary, but the general consensus puts the Straits Course at having nearly 1,000 bunkers.

"Based on (*Golf Digest* Senior Editor) Ron Whitten, we are in the high 900s... 975, maybe 968," Sell says. "We don't keep track. We clean them every 2 weeks. That's all we worry about."

Crank up the manicure

Despite the management-level team having experience with the PGA Championship, the crew does not. Sell estimates that only about 15 of the seasonal employees were around for the 2010



(L to R) Lee, Second Assistant Derek Loda, Zugel and Sell do a walk-through of the course late last month.

PGA. Many of the crew members from that team have taken jobs at other courses, moving up the maintenance ladder.

Though the crew lacks championship experience, it does not lack the overall experience that comes with working at a premiere resort facility like Whistling Straits, where exceptional conditions are expected daily.

"We don't stray much from our routine (for the PGA Championship)," Sell says. "We're doing the same work (in June) that we're going to do in August. We train them to treat it all the same. Getting ready for the tournament is just a matter of cranking up that manicure."

PHOTO BY: HAYLEY MCCORMICK/EPIC CREATIVE



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// WHISTLING STRAITS



Shaun Brill tracks irrigation heads with the help of Sell and Zugel. "We've been really lucky with weather so far this year," Zugel says.


Zugel says it'll be hard to notice any differences in the course from 2010. A few tweaks were made around a handful of greens and some out-of-play areas were redesigned for better spectator viewing.

Agronomically, the preparations will be the same. The only difference might be in the way they monitor greens moisture. In 2010, they were not taking soil moisture readings on each green like they do today.

"It's a little sad in that you've lost the art of managing soil. That's the way I learned, feeling how the soil is, and feeling how it will make it through the day," Zugel says.

"But (moisture meters) help keep everything consistent, and it also helps in training staff that's hand-watering — it's a lot easier to give them a number to water to."

Despite this being the third PGA Championship for Zugel and the second for Sell, it's still not color-by-numbers. And the 2020 Ryder Cup isn't that far away...

"We're lucky we have two (PGA Championships) under our belt," Zugel says. "We know there will be some surprises. We're not in cruise control mode. We're just trying to keep it dialed-in." 

GOLFDOM AT THE PGA CHAMPIONSHIP

For the first time, *Golfdom* will have two reporters working the PGA Championship and covering all things agronomic, as well as behind-the-scenes maintenance photos and player reactions. To follow the coverage from Editor-in-Chief Seth Jones and Associate Editor Grant B. Gannon, visit Golfdom.com/blog or simply follow Golfdom on Twitter: [@Golfdom](https://twitter.com/Golfdom).

PHOTO BY: SETH JONES

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HELP FROM ABOVE

A new era is here for small, low-cost drone photography and mapping

BY CHRIS THOMAS

You've probably seen a few up in the air. But did you ever wonder what drones could be doing to benefit your course beyond the photos or video?

Over the last 5 years a new era in precision agriculture has arrived, and it includes golf courses. What used to take a pilot, a plane or helicopter, a cameraman, a film processor, a cartographer/GIS guy and about 8 weeks can now essentially be done by one person with some skill and a few hours.

Aerial mapping isn't new, but small, fixed-wing or rotor drones with the capabilities for low-cost mapping and NIR imaging is.

While we don't suggest that you go buy a drone and do it yourself just yet, drone mapping should be available soon, and it will be nearly real-time. The images a drone takes are processed into geo-referenced 2D orthomosaics and 3D digital elevation models. Depending on the altitude and resolution you desire, it could take these images less than a day to be on your laptop, in the hands of your GIS guy, loaded on your Google Earth app or sent to the golf course administrator.

These images are easily laid out by KMZ file on Google Earth, which is free. Google Earth is extremely easy to use. Every superintendent and administrator should have it on his or her computer.

Gathering the images

An example of an orthomosaic is on page 34. It was created for a course in Utah and generated from about a 20-minute flight plan using about 65 images processed together.

The images for this orthomosaic were taken from a small fixed-wing platform with an autopilot that is flown by a computer from an easily generated flight plan. Having an autopilot and inertial measurement unit (IMU) fly the drone keeps the aerial platform and the attached camera horizontal to the ground, which makes post-flight processing much easier.

Two types of drones can map courses: fixed-wing drones and rotor drones. Small, fixed-wing drones (planes) fly from a mission flight plan via their autopilot and can easily cover the needed area and adjust when the drone is in flight. Fixed-wing drones are extremely stable and cover a lot of area fast. Fixed-wings require some altitude to fly safely, so the resolution quality of the images is slightly less (2-3cm per pixel) than that of a rotor drone, which achieves better resolution because it's easier to fly at a lower altitude (<2cm resolution per pixel).

Rotor drones fly with an IMU and GPS and can contain an autopilot and also are flown via a flight plan. Rotor drones provide a stable platform and provide extreme resolution, but they don't cover larger areas as well as fixed-wings because flight time is limited by battery power. Fixed wings also move faster.

Continued on page 34



A small rotor drone that takes ultra-high resolution, low-altitude imagery.

ROTOR DRONES PROVIDE A STABLE PLATFORM AND PROVIDE EXTREME RESOLUTION, BUT THEY DON'T COVER LARGE AREAS AS WELL AS FIXED-WINGS BECAUSE FLIGHT TIME IS LIMITED BY BATTERY POWER. FIXED WINGS ALSO MOVE FASTER.

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An orthomosaic showing a part of a golf course used in a wetland study.

Continued from page 32

Low-cost mapping

With the price of near-infrared (NIR) technology dropping and sensor size getting

smaller, NIR is entering the era of low-cost drone mapping as well. NIR allows you to see plant stress before you can see it with the naked eye.

Imagine a drone that flies over your course every couple of weeks. It contains low-cost cameras capable of producing datasets from NIR and RGB bands that allow you to obtain Normalized Difference Vegetation Index (NDVI) calculations to assess moisture content of the soil and areas that detail plant stress. This can all be processed and back to you in the same day in order to make the necessary adjustments. Those images allow you to determine whether your irrigation system, disease control program and fertilizers are working together correctly and covering

Continued on page 36

An advertisement for the EarthWay EV-N-SPRED FLEX-SELECT F80S fertilizer spreader. The image shows a person in a dark jacket and khaki pants operating the red spreader on a green lawn. The spreader is dispensing a fine mist of fertilizer. The text "EarthWay EV-N-SPRED FLEX-SELECT" is written in a stylized font at the top. Below it, "FLEX-SELECT® F80S" and "You've never seen anything like it!" are written. At the bottom, there is a call to action: "For information call 1-800-294-0671 or visit www.earthway.com patents pending". The EarthWay logo and "MADE IN THE USA" are also visible.

A photograph of a person in a green jacket and dark pants hand-launching a small, white fixed-wing drone into the air. The drone has two cameras attached to its wings. The person is standing in a grassy field under a blue sky with some clouds. The text below the image reads: "A small fixed-wing drone with two attached cameras is hand launched. It is then switched over to autonomous flight at a specific altitude." The photo is credited to "PHOTOS COURTESY CHRIS THOMAS" on the right side.



Who will be the next Herb Graffis Businessperson of the Year?

Now accepting nominations at Golfdom.com/Graffis

The Herb Graffis Business Person of the Year Award, presented by *Golfdom* and sponsored by Jacobsen, is awarded each year to a person in the golf industry who is making a positive impact on the bottom line of his or her facility with outside-the-box, cutting-edge thinking and overall business acumen.

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- » An expenses-paid trip to the 2016 Golfdom Summit

The award is named in honor of Herb Graffis, one of the first people to look at golf as a business when he founded *Golfdom* in 1927. With his foresight, Graffis helped advance the game in numerous ways, from co-founding the National Golf Foundation and the Club Managers Association to his work advocating on behalf of the superintendent and helping elevate their profile. In 1977 he became the first journalist to be elected to the World Golf Hall of Fame.

2015 winner »
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Continued from page 34
the areas you want.

The image to the right is another example of images showing a slightly larger area of the course with the attached valve layouts. Again mapped with a fixed-wing drone, it was flown in the fall after leaves had fallen so areas of cattails, open water and the river could be seen.

This map originally was used to show vegetation and wetland management boundaries for an ongoing environmental study. Wetland studies and environmental impact statements are another important area where drones can help course managers and administrators manage within their specific guidelines. Using Google Earth, orthomosaics that are georectified can monitor wetland areas, open water and even certain plant species (specifically with the spread of phragmites in the West and the amount of water they absorb.)

Once a drone is switched over to au-



Post-processed image creates a KMZ file that can be downloaded and opened on Google Earth and which automatically georectifies itself and covers the imagery at that location.

tonomous flight, the auto-pilot provides straight and level flight at a specific altitude, which aids in image processing and obtaining a specific resolution.

The future of drones for precision course management depends on what the FAA rules is allowable later this year. The FAA is currently allowing some companies to do precision agriculture mapping, and more will follow. Golf courses not located

in highly populated areas and away from airports and flight paths stand a high chance of being able to use drones for course management in the near future. **G**

Chris Thomas owns Aerial Pursuit Mapping, specializing in small area, high resolution, geo-rectified UAV mapping. For more information visit aerialpursuit.org. Thanks to Randy Oldham, Miguel Leonardo and Rio Thomas for contributing to this article.

PHOTO COURTESY CHRIS THOMAS

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DORMANT SPRIGGING OF BERMUDAGRASS AND ZOYSIAGRASS

By *Juming Zhang, Ph.D.*

Many bermudagrass and zoysiagrass cultivars cannot be seeded and are commonly planted vegetatively using sprigs, especially for sod production or in sand-based systems such as athletic fields and putting greens. Traditionally, sprig planting has been accomplished during the warm-season growing months when soil temperatures are capable of initiating and promoting growth. However, this often results in an extended grow-in period and can significantly reduce the use of the turf in the first growing season.

The objective of this study was to determine if vegetative sprigs of bermudagrass and zoysiagrass could be established earlier in the year during the dormancy phase to hasten establishment. The study was carried out at the Agricultural Research and Extension Center of the University of Arkansas,



Pictures from the field trial on July 21, 2014. Bermudagrass plots are in the foreground and zoysiagrass plots in the background.

Fayetteville, using sprigs of Tifway bermudagrass and Meyer zoysiagrass. Plantings were applied on March 28 (dormant), May 30 (spring) and July 22 (summer), respectively, by spreading sprigs on the native soil field then topdressing with 0.4 inches of sandy topsoil and compacted with a light roller. For each planting date and each species, there were three sprigging rates, at 344 bu./acre, 688 bu./acre and 1,032 bu./acre.

Turfgrass coverages were monitored weekly using digital image analysis to evaluate establishment rates. Sprigging rate had no effect on bermudagrass and minimal effects on zoysiagrass establishment. Excellent results were obtained for both species with dormant sprigging, suggesting that early planting can result in earlier sod harvest or use of the turf than waiting until spring or summer to plant. For zoysiagrass, it appears that full coverage can be reached in the first season if dormant planting dates are used.

Juming Zhang, Ph.D., South China Agricultural University, Guangzhou, Guangdong Province, China and Mike Richardson, Ph.D., University of Arkansas. Richardson can be reached at mricha@uark.edu for more information.

NEWS UPDATES

EPA FINALIZES THE CLEAN WATER ACT RULE

The final Clean Water Rule released by the U.S. Environmental Protection Agency and the Army Corps of Engineers expands jurisdiction of the agency and will take effect on Aug. 28.

Under this rule, first reported by Chava McKeel, GCSAA director of government relations, golf course water bodies including rivers, streams, creeks, wetlands, ponds, ditches and ephemeral drainages may now come under federal jurisdiction. If a golf course has one of these waters on them or near them they will likely be required to purchase federal permits for any land management activities or land use decisions in, over or near them.

The eight categories of surface waters that will be regulated starting this August are traditional navigable waters, interstate waters, territorial seas, impoundments, tributaries, adjacent waters, enumerated regional features with a significant nexus and waters in the 100-year floodplain/4,000 feet of a water of the U.S. with a significant nexus.

"It is important to start reviewing the water bodies on your property to determine whether they fall into any of the new categories," said McKeel. "If they do, then your course may need to comply with new future permitting requirements."

The final rule excludes features like artificial, constructed lakes and ponds created in dry land, storm water control features and erosional features.

ACCESS TO A SMALL-AREA SPRAYER... WILL PREVENT MISAPPLICATION OF PESTICIDES TO SMALL AREAS."

Zac Reicher, Ph.D.

(see full story on page 38)

//DIY: GOLF SPRAYER

DIY project: Building an accurate small-area sprayer

By Zac Reicher, Ph.D.

Golf course superintendents often are required to accurately and uniformly apply low rates of pesticides over small areas where larger boom sprayers, handgun sprayers or even small hand cans do not work well. Additionally, applications around bunkers, landscape beds, sidewalks, etc., always are difficult to make accurately and uniformly.

My favorite (and easiest to make and use) sprayer is made by attaching a hand-held two- or three-nozzle boom to a 3- or 4-gallon backpack sprayer (Figures 1-3). Two-nozzle (model 6012) and three-nozzle booms (model 601D) are available for as low as \$130 from R&D sprayers (www.co2sprayers.com). We use compression fittings for air hoses and also include a pressure gauge on the sprayer to maintain consistent pressure as we are pumping. Depending on walking speed, nozzle number and size, pressure, etc., spray volumes are typically in the 0.25 to 1.0 gal/1,000 sq. ft. range.

At Lochland Country Club, Hastings, Neb., Superintendent Craig Ferguson and his staff converted a walk-behind rotary spreader into a 5-foot wide boom sprayer that is powered by a battery-operated pump (Figures 4-7). The 8-gallon plastic tank they used was from an old foam marker system, but any small tank that is suitable for pesticides would suffice. It also includes a bypass system to ensure constant agitation. All of the other components are at your closest farm supply store or on the Internet. This sprayer is a little more complex, but it will be perfect for accurate applications to larger areas.

FIGURE 1



Attaching a two- or three-nozzle boom to a backpack sprayer provides a simple and accurate method of applying low rates of pesticides to small areas.

FIGURE 2



A pressure gauge is critical to maintain consistent pressure when using the pump-up backpack sprayer.

PHOTOS COURTESY ZAC REICHER

FIGURE 3



A backpack boom sprayer is easy to make accurate, and can be used to apply pesticides uniformly to small areas and/or around obstacles.

FIGURE 4



An 8-gallon boom sprayer fabricated on a rotary spreader frame at Lochland CC in Hastings, Neb., by Craig Ferguson and his staff.

Making a backpack sprayer is easy with items from around the shop, at the farm supply store and on the Internet.

CALIBRATING THESE SPRAYERS IS IDENTICAL TO CALIBRATING ANY BOOM SPRAYER

- 1 Measure the time it takes to walk a known distance of a calibration course at a comfortable walking speed. The calibration course should be the equivalent of 1,000 sq. ft., so length of the calibration course depends on the width of your spray

Continued on page 40

Continued from page 39

boom. You can use a speedometer on the walk-behind sprayer to maintain a consistent walking speed. We often use a metronome (also available at R&D Sprayers) to set a walking speed with the handheld sprayer. The metronome helps with consistent timing between steps.

- 2 Measure the area in sq. ft. covered in the calibration course (width of spray boom coverage multiplied by the length of your calibration course). Again, 1,000 sq. ft. is a convenient area for the calibration course.
- 3 Measure the output from all of nozzles in ounces or milliliters for the same amount of time it took to walk the calibration course and covert to gallons (128 oz./gal. or 3785 mls./gal).
- 4 Assuming a 1,000 sq. ft. calibration course, your output is the answer to step No. 3 above in gals./1,000 sq. ft. or mls./1,000 sq. ft.

EXAMPLE

- 1 It takes 50 seconds to comfortably walk a 200-foot-long calibration course.
- 2 The example sprayer is a three-nozzle, 5-foot wide sprayer, so 5 feet X 200 feet = 1,000 sq. ft. calibration course.
- 3 Catching the output from each nozzle for 50 seconds, you find that total output is 130 oz. = 1.02 gal (128 oz./gal).
- 4 The calibration for this sprayer = 1.02 gal/1,000 sq. ft.

Ready access to a small area sprayer will make your operation more efficient and will prevent misapplications of pesticides to small areas that are difficult to spray with large spray equipment.

Zac Reicher, Ph.D., is a technical specialist on the Greens Solutions Team at Bayer Environmental Science. He can be reached at zac.reicher@bayer.com for more information.

FIGURE 5



Valve, pressure gauge and tubing for a small area walk-behind sprayer. This sprayer also includes a bypass to maintain agitation.

FIGURE 6



Battery-powered 12-volt pump found in most farm supply stores.

FIGURE 7



8-gallon sprayer mounted on a rotary spreader frame can cover 5,000 sq. ft. or more.

AWARD WINNING

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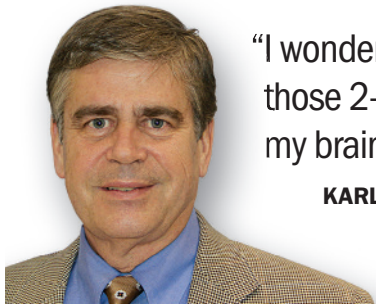
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- » **Writing, Column:** "Those guys," Matt Neff
- » **Writing, Column:** "Are you ready for some Fantasy Greenkeeping?," Matt Neff
- » **Writing, Product Information Article:** "What's the next big idea at GIE+Expo?," Seth Jones
- » **Writing, General Feature Article:** "True romance," Seth Jones
- » **Writing, Series:** "Winterkill in the crosshairs; Working undercover," Sam Bauer, Brian Horgan, Ph.D., Lindsay Hoffman, Ph.D.



Gardner Award, New Media, for The *Golfdom* Daily

A "best in show" award was presented to *Golfdom's* blog. Check it out by visiting Golfdom.com.



“I wonder how long it would take to fill all those 2-liter bottles... I don't know, but my brain just exploded.”

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

Do the math

Maintaining high-quality golf course turf during the growing season requires considerable inputs. We add nutrients to promote an ideal growth rate and maintain a healthy turf. We apply synthetic or biological pesticides to manage pests, and we use products like wetting agents to enhance the role of soil in maintaining healthy plants. The turf market offers numerous products that may help provide turf health.

We often tank mix combinations of these products in a 150- to 300-gallon sprayer and apply at approximately 44 to 88 gallons per acre. The reasons for tank mixing range from efficiency (superintendents don't want to be spraying more than they have to) to mandates (golf course spraying is limited to when the course is closed). How many products are often tank mixed together? The number varies widely. The most that I have heard is 26, but it's not uncommon to hear eight to 12 products.

Your tank mixes generally have developed over time based on suggestions and recommendations from others to trial and error, with the result being a desirable spray. But what happens when — let's say during summer stress — your spray causes turf injury? That's when the finger pointing begins. “It

must have been such and such product,” you think. But how do you really know if it was one product, or if it was the interaction of products under the given conditions that caused the injury?

Let's have some fun and look at a hypothetical scenario to answer our question.

We tank mix 10 products together and spray our fairway (or greens). We notice turf injury a day or two later. Given that it's the middle of summer and the turf is under stress, we assume (rightly or wrongly) that what we sprayed caused the damage. We make this assumption because we saw no damage when we previously used this tank mix. We need to know specifically what product or products caused the damage so as to minimize the chances of injury occurring again. So we approach a turfgrass researcher to con-

duct a study to determine the cause.

To set up this study the researcher looks at all combinations of products mixed in the tank, which would be the treatments. In other words, the number of treatments would be all possible combinations: $10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ or 3,628,800 treatments. The researcher replicates each treatment at least three times, which leaves us with 10,886,400 plots. If each plot were 3 feet by 5 feet (15 square feet), we would need approximately 3,749 acres of fairway turf. If the researcher assumes that 25 acres of fairway exist on a golf course, he/she needs 150 golf courses to do the study.

Our researcher most likely makes treatments with a carbon dioxide (CO₂) backpack sprayer consisting of a CO₂ canister that pressurizes a 2-liter bottle containing the treatment. The researcher needs 7,257,600 liters of water (3,628,800 treatments times 2), or 1,917,255 gallons of water, to fill the 2-liter bottles. For perspective, a tanker truck that pulls into a filling station contains 9,000 gallons of gasoline. I wonder how long it would take just to fill the 2-liter bottles, or if it be possible to apply all the treatments in one day? I don't know, but my brain just exploded.

Actually, the above scenario is a pretty simple one. We do not account for formulation changes that may occur between patented or off-patent products, special formulations or combinations of actives within a product.

Under extreme summer stress, I recommend reducing the number of products you mix in a single spray tank to reduce the likelihood of injury. For example, if turf injury occurs with a three-product tank mix, the total number of treatments needed to identify the problem would be 6 ($3 \times 2 \times 1 = 6$ treatments). I think I could do that.

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

Less stressful and more successful renovation projects

The pace of golf course renovation is picking up, particularly in south Florida where Kipp Schulties of Kipp Schulties Golf Design has developed a thriving business specializing in renovations. I had the good fortune of listening to Schulties speak to a group of club managers attending the Club Managers Association of America (CMAA) Best Management Institute–Golf about golf course renovation and I want to share some of Kipp’s key points for successful renovations.

According to Schulties, the reasons for undertaking a renovation vary from club to club but generally are driven by one or more of the following:

Competition. Golf is a competitive business and clubs need to offer a quality product to attract and retain golfers or risk losing business.

Playability. In south Florida, memberships are aging and golf courses need to be adapted to the skills of older players, which includes eliminating forced carries.

Age of the golf course. Many courses in south Florida are 30 to 35 years old, and the irrigation systems, drainage systems and grass varieties need to be updated.

Outdated design. While a course needs to be playable for golfers of all skill levels, many courses were built before the huge advances in ball and club technology, and in many cases the turning points of dogleg holes and fairway bunkers are not far enough from the back tees to remain a challenge for skilled players.

Water use. South Florida weather is characterized by distinct wet and dry seasons, making irrigation essential to maintain turf. Water rationing has been mandated in some years, and golf courses must be prepared to use water efficiently.

“Multiple sets of forward tees are critical to keep less skilled or older golfers playing.”

Americans with Disabilities Act (ADA). A key component of ADA as it applies to golf courses is the removal of barriers to allow everyone access to play the golf course.

The experience gained from many renovation projects leads Schulties to offer the following advice on making a club’s renovation committee successful. The first step is to identify

and select a “flag bearer” for the renovation project. The flag bearer should be someone passionate about the renovation and who is well liked and respected by all the members. Selection of the remaining renovation committee members should be done with care. The committee should include people with a construction and/or civil engineering background, people with legal experience, people with experience in finance and men and women golfers representing all skill levels.

Early in the renovation planning process, Schulties requests the club identify four focus groups composed of low-handicap women, low-handicap men, high-handicap women and high-handicap men. Schulties meets with each of these focus groups separately, and hole-by-hole asks them the same questions: “What do you like about the hole?” “What do you dislike about the hole?” and “What would you change about the hole?” Using this process, Schulties gathers much of the information he needs to improve each hole. Schulties also shared that he has learned from focus groups to respect what the members like, and to leave that feature or characteristic alone.

Schulties finished his presentation by discussing

a few agronomic keys to a successful renovation. He listed drainage as No. 1. Drainage is important on all courses, but particularly so in south Florida, where the water table is so close to the surface.

Making sure the size, shape and orientation of the green are appropriate for the intended shot is critical, as is providing a sufficient number of pin locations. Kipp is an advocate of multiple tees. Many of his designs have six or eight sets of tees per hole. He believes multiple sets of forward tees are critical to keep less skilled or older golfers playing and to bring new players to the game. He devotes a significant amount of time and energy to placement and shape of bunkers.

I and the other attendees at the CMAA BMI-Golf gained a greater appreciation of successful golf course renovation through Schulties sharing his experience and expertise as a golf course architect.

Kipp Schulties can be reached at Info@KPGolfDesign.com for more information.



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

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BY GRANT B. GANNON // Associate Editor

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Johndeere.com/golf

2. Reelmaster 5010-H

The **TORO** Reelmaster 5010-H is the first fairway mower to offer a true hybrid drive system. It's exclusive PowerMatch technology delivers the power an operator needs for quality fairway playing conditions. It can deliver more than 40 horsepower on demand for climbing steep hills, verticut-

ting, scalping or to support other peak-load situations. In addition to power and performance, the PowerMatch system delivers an average fuel savings of 20 percent compared to a conventional large-area reel mower, depending on terrain and cutting conditions.

Toro.com

3. LF510 fairway mower

The LF510 from **JACOBSEN** is a five-gang fairway mower featuring a 100-inch width of cut, 5-inch TrueSet cutting units and a Tier 4 Final Kubota diesel engine. The mower also offers simplified maintenance features, including wet parking brakes, an onboard control module and accessible service items. Technicians do not have to worry about additional exhaust after-treatment filtration devices, technology or service because the LF510's Kubota engine is compliant with Tier 4 Final emission regulations.

Jacobsen.com

4. EV-N-SPRED Flex-Select F80 with SideSpred-Control

Coming in fall 2015, **EARTH-**

IT SEEMS MANUFACTURERS are always releasing new products "designed with superintendents in mind." They must think superintendents are getting lazy and want to spend less time on the course, because the new products seem to save professionals more time and effort (insert rim shot and hum of crickets).

Terrible jokes aside, manufacturers are doing everything they can to develop products that make superintendents' lives easier, and the following products prove that point.

WAY PRODUCTS will offer the EV-N-SPRED Flex-Select F80 with SideSpred-Control. The F80 is the first model in the FLEX-SELECT series of broadcast spreaders. The SideSpred-Control is a new shut-off system that when engaged limits material flowing out of the hopper and into the left side pattern at the wheel edge. This eliminates the need for a deflector and has little effect on the application rate.

earthway.com

5. Broadcast Push Spreaders

TURFEX offers four models of broadcast push spreaders that feature heavy-duty polyethylene construction and accurate material-feed systems. The TS65 and TS85 models offer 75- and 120-pound capacities, respectively, and come with powder-coated frames. The TS65SS and TS85SS have matching specifications but are equipped with stainless steel frames for corrosion protection. With a maximum spread width of 12 feet, the spreaders have precise distribution of granular materi-

als, including fertilizer, pesticide, herbicide and seed.

Turfexproducts.com

6. T3100

Coming in at a width of 35.5 inches, the T3100 from **TURFCO** can fit in the tight places you need to go. Its hands-free speed control allows operators to set the speed and keep their hands free for engaging or disengaging the spray or granular application. The hopper has a 175-pound capacity, and combined with the 100-pound carrier tray enables the user to cover up to 132,000 sq. ft. per fill. The T3100 doubles as a sprayer with an 18-gallon tank.

Turfco.com

CONTINUED ONLINE

For more listings of top mowers & spreaders, go to golfdom.com/category/products





1



2



3



4



5



6

The 19th Hole

Jared Nemitz

SUPERINTENDENT // The Peninsula Club, Cornelius, N.C.



After 18 holes, what's your drink of choice? A perfectly blended Coca-Cola.

You just hosted 40 supers. What was the occasion? It was an Ultradwarf Putting Green Surface Management seminar put on by the USGA. Rod Lingle came from Memphis CC. Together we showcased a variety of management strategies to produce high quality playing conditions. It gave me an opportunity to put our greens and practices on display. We had superintendents from Alabama, Georgia, Tennessee, North and South Carolina.

You're a self-described "turf-nerd." Why do you say that? I'm ready to talk about grass anytime. And I can break out the agronomic Excel spreadsheets to prove it.

I'm impressed with your dedication to spreadsheets. What's your most useful one? By far clipping weights, taking clipping weights off the same green everyday, and Stimpmeter readings. Those two help to dial things in.

Explain the clipping weights to me. We weigh the clippings off our No. 10 green daily. We know from these numbers how the grass is reacting to our

inputs. On our greens, light would be anything less than 40 grams per 1,000 square feet. Medium, 40 to 80 grams, heavy is anything greater than 80 grams. It gives us a broad idea of what's happening on the green. Generally you're trying to keep the grass between light and medium. The less grass I'm taking off, the more smooth and in control I am of the playing surfaces.

You worked at St. Andrews. How did that come about? I studied at the University of Aberystwyth in Wales. I realized that the 2005 Open was going to be at the "Home of Golf." I called the director of greenkeeping, Gordon Moir. He was very accommodating. He invited me to come and participate in the Open. I couldn't have asked for a better capstone to my educational internships.

So what are your teams? I root for the Purdue Boilermakers, the Tennessee Titans and the Atlanta Braves.

Are you married? Kids? I have been married for 9 years to Rachael. I have one little girl Ainsley and a little boy on the way, due in October.

Things are going to get busy! I've never been more nervous in my life. I already thought I was busy, I'm not sure where this extra time is going to come from. ...I'll make an Excel sheet for it, I'll figure it out.

As interviewed by Seth Jones, June 30.



surface Management seminar put on by the USGA. Rod Lingle came from Memphis CC. Together we showcased a variety of management strategies to produce high quality playing conditions. It gave me an opportunity to put our greens and practices on display. We had superintendents from Alabama, Georgia, Tennessee, North and South Carolina.

"THE GREENS AT ST. ANDREWS ARE SOME OF THE MOST AMAZING GREENS IN THE WORLD. BUT IT'S NOT ABOUT SPEED. THEY DON'T HAVE TO BE 13 OR 14. IT'S ABOUT HOW SMOOTH THEY ARE, LARGE THEY ARE AND ALL THE UNDULATIONS."



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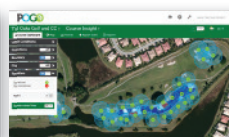


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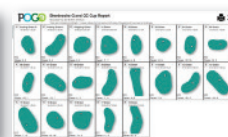
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Adam Bagwell; Crane Creek CC, Boise, ID

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