

# Golfdom

04.16

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Three par-3 courses that aren't just good  
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NEW TREND: ROLLING FAIRWAYS

SOIL SURFACTANT STRESS TEST

THE PERILS OF PGR OVER-REGULATION



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savings  
stack up.**



# “Preliminary tests indicate increased

## NEW SMITHCO ULTRA 10 AND ULTRA 15 FAIRWAY ROLLERS



*Ultra 10 Fairway Roller*

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*Ultra 15 Fairway Roller*



# rolling frequency reduces dollar spot.”

–University of Massachusetts, Stockbridge School of Agriculture

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**Geunhwa Jung** and **Jay Popko**  
Stockbridge School of Agriculture

## TEST SUMMARY TO DATE

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

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

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

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

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

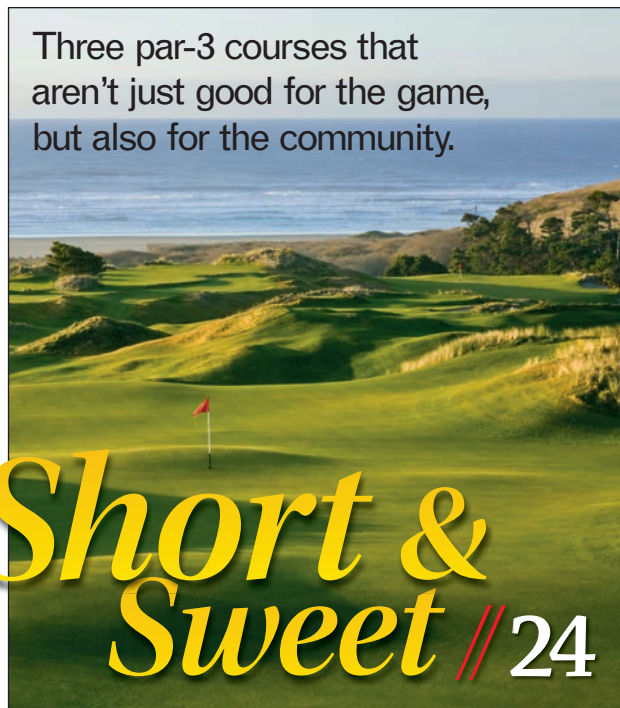
We presume ball roll will be increased, however further studies are needed to evaluate these affects. Additional studies will be performed next year.



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# Golfdom

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“The drive from Boise to Billings — about 10 hours of windshield time — was beckoning. I wanted to get out on the road and see some of these two great states.”

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

## Kicking the bucket

**I**t was this time last year when I was grabbing lunch with Tom Watson — the Friday before the Masters. Apparently, Mr. Watson didn’t need my witty lunch repartee in preparation for this year’s Masters, the last one he’ll play.

But that’s OK, I’m happy to report that even though I’m not dining with World Golf Hall of Famers this week, I’m still kicking the heck out of my bucket list.

I recently marked off three items: a trip to two states I hadn’t previously visited (Idaho and Montana), and higher up on the list, I went fly fishing in Montana.

Thanks to Lori Russell and the good folks at the Idaho GCSA, I was invited to speak at their spring meeting. Brian Horgan, Ph.D., University of Minnesota, and Bill Griffith of Walla Walla Community College were the other speakers. (I appreciate the Idaho chapter letting me dumb down their meeting a bit.)

Great meeting, fantastic people. I admit I bailed out before the golf event. That’s not something an editor of a golf magazine is supposed to do, but the drive from Boise to Billings — about 10 hours of windshield time — was beckoning. I wanted to get out on the road and see some of these two great states.

It’s a beautiful drive. Also of note, it’s an 80-mph speed limit on the interstate. But when I took a back road in Montana, a state trooper was kind enough to remind me that it’s not 80 mph *everywhere*. Specifically, it was 55 mph where I was driving 74. I said I was visiting on business, and when I handed over my Kansas driver’s license I said, “I’m a Jayhawk.” Somehow that worked

and he gave me a warning. Maybe he knew my Jayhawks were destined to get bounced in the Elite Eight. Or maybe he was just a nice sheriff. But feel free to try that excuse next time you’re speeding in Big Sky Country.

How’s this for luck: the EIFG’s online auction for the *Golfdom* Summit Golden Ticket had just ended on that Tuesday, and our winner, Dane Gamble, is a superintendent in Bozeman, Mont., which I was driving through on Wednesday.

Guess who I had the pleasure of having dinner with in Bozeman? It’s better to be lucky than good.

Back on the road, I got to Billings late Wednesday night. Clark Throssell, Ph.D., *Golfdom*’s research editor,

was kind enough to put me up in his guest bedroom. We were all set to get out on the Big Horn River the next morning.

On the 45-minute drive from Billings to the river, Clark and I discussed the research section of the magazine. Hey, this was a business trip, after all. We came up with this million-dollar idea: While we enjoy the research section, it could be better... with your feedback. Our door is open for your suggestions. This is my plea to you to write in and tell us what you’d like to see more of and less of.

Back to the fly fishing. My intro to the whole experience was falling into the river as I got out of the boat. But I recovered and am happy to report I caught one solitary rainbow trout, avoiding the shutout. Clark and Stribs (see page 12, photo No. 1) didn’t have a whole lot more luck than me. Stribs was impressed I caught one, given the way the fish were behaving.

By the end of the day I was beat up, exhausted and hungry. We found a little Chinese buffet near the highway. For \$7 a plate it was all-you-can-eat General Tso’s chicken, broccoli beef and fried rice, with my friends Clark, Stribs and Randy.

There were no World Golf Hall of Famers at the dinner, but in terms of the bucket list, it was the perfect conclusion to a hall-of-fame day.

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# Starter

NEWS, NOTES AND QUOTES



## // DA PLANE, BOSS, DA PLANE



In this Friday, March 18, 2016 photo, authorities check out a small plane that crashed on the 14th hole at Tallgrass Country Club in Wichita, Kan. The two passengers were taken to Wesley Medical Center for treatment, according to The Wichita Eagle.

## FLORIDA AND KANSAS COURSES HOST EMERGENCY LANDINGS



St. Petersburg (Fla.) Country Club and Tallgrass Country Club, Wichita, Kan., are more than 1,000 miles apart, but the courses now have something in common. Both recently had teenage pilots flying single-engine airplanes land on their golf courses, but Tallgrass CC will have to deal with the aftermath for much longer.

On March 5, an 18-year-old pilot experienced mechanical issues and was directed to make an emergency landing at a nearby airport. When the pilot realized he wouldn't make it, he saw St. Petersburg CC and put the plane down on the 12th fairway, according to Tampa Bay NBC affiliate WFLA.

A wing struck a tree while coming to a stop, but the pilot and another teenage passenger were not injured.

Less than two weeks later, on March 18, a plane flown by a 17-year-old pilot flying from Nashville, Tenn., lost power before it was scheduled to land at Wichita's Jabara Airport. Failing to make it to the airport, the pilot landed the plane 1.5 miles short of its destination, on the 14th fairway of Tallgrass CC.

The pilot and his 18-year-old passenger didn't suffer serious injury, but the plane will remain on the course for weeks, according to the *Wichita Eagle*.

Typically, a crane comes in to load a crashed plane onto a flatbed trailer, but the houses surrounding Tallgrass are too close together for the crane to pass between them. A crew will have to remove the plane in pieces small and light enough to carry out one at a time, a process that could take a month.

## // SALUTE TO SERVICE

### BUNKERS IN BAGHDAD

Bunkers in Baghdad, a program that sends new and used golf balls and golf clubs to U.S. soldiers stationed around the world, recently shipped donations to Brazil, its 40th country.

Joe Hanna, Bunkers in Baghdad's president and founder, was inspired in 2008 to start the program after learning about numerous makeshift driving ranges throughout Iraq set up by soldiers as a form of stress relief. He then went about collecting golf balls and clubs. The first package was sent in November 2008, in time for the holidays.

Over the course of the next seven years — and with the help of national golf corporations, golfers on both the LPGA and PGA Tours, national golf associations, golf courses from around the country, local school districts and individuals — the project has turned in 6,950,000 golf balls and more than 495,000 clubs, according to Bunkers in Baghdad's website.

## // HARD WORK PAYS

### REINDERS STAFF RECEIVES TORO SALES AWARDS

The Toro Co. held its worldwide distributor meeting at the 2016 Golf Industry Show in San Diego and recognized its top sales performers, including two employees from green industry distributor Reinders, Sussex, Wis.

Gronit Rundblade, SCPS, and Aaron Goninen were named 2015 Rookie of the Year for commercial equipment sales and 2015 Salesperson of the Year for golf irrigation sales, respectively.

Rundblade was recognized for outstanding accomplishments in understanding the product mix and providing customer solutions in a short period of time, according to a press release. To be eligible for the Rookie of the Year award, a sales representative must have less than 24 months of experience of selling Toro equipment.

Goninen took home the Blue Blazer award for his work in golf irrigation sales. This award is given to an individual who has provided sales and support excellence that brings value to customers, according to Reinders.

//IT'S FOR FREE

## Two Capillary Concrete jobs: One Olympic and one winner

➔ Capillary Concrete bunker liners will be installed on two more courses this year. San Francisco's Olympic Club is preparing for a major championship, and Barrington Golf Club, Aurora, Ohio, was selected from Annika Sorenstam's hat.



The Olympic Club is installing Capillary Concrete bunker liners in preparation for the 2021 Women's U.S. Open.

Work at The Olympic Club started in late February, and Troy Flanagan, the club's director of golf maintenance, brought in GCBA Certified Builder Frontier Golf to complete the bunker renovation. Architect Bill Love and associate Brian Kington were hired to add style to the bunkers and additional challenges around the Olympic Club's greens for its next major championship, the 2021 Women's U.S. Open.

The Capillary Concrete booth at

both the PGA Show and the Golf Industry Show had sign-up sheets for attendees to be entered into a drawing for a free bunker installation. All of those who entered eventually were whittled down to a couple of names and placed into a hat owned by Annika Sorenstam, a Capillary Concrete partner. She reached in and pulled out the winner, Mark Figurella, superintendent at Barrington GC.

THEY SAID IT

**JIMMY FALLON**  
HOST OF "THE TONIGHT SHOW"

**"A company in Japan is testing a new drone on a golf course that delivers golf balls and refreshments. That's right — a drone that brings you drinks and gets you golf balls. ...Or as my dad called it, 'Jimmy.'"**

GO FIGURE

**93**  
MILLION

Amount of rounds played by golfers between the ages of 18-34, according to the National Golf Foundation.

//BILLY'S BEST

### BILLY CASPER GOLF NAMES SUPERINTENDENT OF THE YEAR

Billy Casper Golf (BCG) named Jason McIntyre of Fellows Creek Golf Club, Canton, Mich., its "Superintendent of the Year" at the management company's recent regional meeting in Williamsburg, Va.

According to BCG, McIntyre was selected for the honor because of his "above-and-beyond performance in all areas of agronomic management." Fellows Creek is a 27-hole facility located 30 minutes west of Detroit.

"We are extremely proud of Jason and honored he's part of the Billy Casper Golf family," says Joel Gohlmann, senior vice president of BCG. "He is critical in helping Fellows Creek achieve financial growth by presenting a gorgeous golf course every day."

ABOUT THE COVER

No. 5 at Bandon Preserve plays to 142 yards from the back, 95 yards to the front, and offers a majestic view of the Pacific Ocean. The hole was photographed in all its beauty by Oregon-based photographer Wood Sabold.





**T**he third hole at Isla Del Sol Yacht & Country Club, St. Petersburg, Fla., separates itself from the competition thanks to a challenging design and picturesque views.

This par-4 is 340 yards from the back tees and requires a solid tee shot to set up an iron shot to the bunker-protected green. Golfers ultimately are rewarded once they hit the waterside green with a picturesque view of Boca Ciega Bay and the Sunshine Skyway Bridge in the distance.

"The best part of the hole is when you are standing on the green with your foursome and you're able to look out over the water," says Kevin Sunderman, Isla Del Sol Y&CC's director of grounds since 2005. "It's a serene and relaxing view."

When he started at Isla Del Sol Y&CC, the fairway and rough were mowed at typical heights. That changed in 2014.

While the club's snowbird members were away that summer, Sunderman decided to cut down the bermudagrass to let it thicken and increase its density. The members still around played the course and fell in love with the new conditions. They enjoyed it so much that 65 acres of Isla Del Sol's total 80 acres now are cut at one height with fairway units.

Maintaining the course at the new fairway height is labor intensive because while the rough needs to be mowed only once a week, the fairways need to be cut two to three times each week. That's where Syngenta's plant growth regulator Primo Maxx comes in. Sunderman uses it every three to four weeks during the growing season to reduce mowings.

"If I weren't able to use the growth regulator I would have a difficult time keeping up with the growth of the grass," says Sunderman. "With Primo Maxx, I only have to mow it twice a week, and it probably ends up being more important than my fungicide."



**Kevin Sunderman**  
DIRECTOR OF GROUNDS

# Hole



# Hole No. 3

## Isla Del Sol Yacht & Country Club

ST. PETERSBURG, FLA.

▶ 340 YARDS, PAR 4

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# Golfdom Gallery



1

**1 Something's fishy** (L to R) Joe Stribley, Yellowstone CC, Billings, Mont., with *Golfdom's* Clark Throssell, Ph.D., and Seth Jones on a recent fly-fishing trip on the Big Horn River in Montana. But fellas, where's the fish?



2

**2 Tell him what he's won!** Justin Kirtland, Arrowhead GC, Wheaton, Ill., gives David Radaj, CGCS at Green Acres CC, Northbrook, Ill., a pat on the back for being the winning bidder of a 2016 *Golfdom* Summit Golden Ticket.



3

**3 The assistant's lament** *Golfdom's* Associate Editor Grant B. Gannon and Curtis Keller, assistant superintendent, Illini CC, Springfield, Ill., dream of a magazine and a course they can someday call their own.



4

**4 Meeting of the minds** Lori Russell, executive director, Idaho GCSA, Kevin Hicks, Coeur d'Alene (Idaho) Resort GC, Dave Phipps, GCSAA Field Staff, and Brian Horgan, Ph.D., University of Minnesota, enjoy a beverage at Boise, Idaho's Red Lion Downtowner.



5

**5 Going once, twice, sold!** On his way to Billings, Seth stopped in Bozeman, Mont., to visit Dane Gamble, Bridger Creek GC, and thank him in person for bidding on and winning the EIFG's auction of a *Golfdom* Summit Golden Ticket.



6

**6 Shooting the bull** John Gurke, CGCS, Aurora (Ill.) CC, with Dave Groelle, CGCS, Royal Melbourne CC, Lake Zurich, Ill. We like Gurke because he pens the popular "Bull Sheet" in the MAGCS publication *On Course*, and we like Groelle because we're Foo Fighters fans.



7

**7 We're kind of a big deal** Brian Thompson and Scott Cole of BASF, with Doug Miller, vice president of agronomy, ClubCorp, and "Uncle" David Hay, CGCS, Indian Wells (Calif.) CC, enjoying the nice weather in San Diego.

PHOTOS BY: RANDY SAVER (1); SETH JONES (2, 4, 6, 7); PAT ROBERTS (3)





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“Often I imagine the upside of having time to attend winter turf conferences like the Golf Industry Show... Meanwhile, Sun Belt superintendents constantly are on their smartphones, checking with the course back home because of peak winter play.”

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

## Superintendents for all seasons Snow Belt versus Sun Belt

**S**uperintendents are people for all seasons. Even though I have moved cross-country I am still in the Sun Belt (for agronomic purposes). Although California’s unique geography provides a wide variety of climatic zones within relatively short distances, most golf courses are open year round, while some courses in the Sierra Madre Mountains might be closed for winter, thanks to El Niño.

Meanwhile, the traditional Snow Belt and Sun Belt courses do their annual flip-flop of slowing down and speeding up operations to meet the demand of the golfers and/or Mother Nature. This seasonal difference always intrigued me because of the 24-7/365 operational calendars in the state’s south versus the total shutdown and open-up cycle in the north.

Often I imagine the upside of having time to attend winter turf conferences like the Golf Industry Show and other venerable regional gatherings while the irrigation system is off and the course is closed. Meanwhile, Sun Belt superintendents constantly are on their smartphones, checking

with the course back home because of peak winter play.

The northern down time often is spent rebuilding equipment and working on budgets for the coming year, with perhaps a skeleton crew doing tree trimming and storm debris cleanup. There also is the fear that severe winters might kill some of the greens, with their shallower root systems. (Speaking of which, from the Mid-Atlantic States to New York, the worst blizzard in two decades hit in late January!)

This time used for equipment repairs does provide some interesting exchanges between seasonal golfers and Sun Belt superintendents. I remember hearing stories of

budget meetings when the southern super asks for a new mower or other piece of equipment. When listing reasons the mower is necessary, the super might mention that the mower is more than five years old. A snowbird member remarks, “Our mowers back home last 10 to 15 years!” Obviously, those folks don’t realize what’s going on back home while they’re digging divots in the sunshine.

Thanks to the predicted El Niño weather pattern this year, superintendents everywhere are on edge. As I peruse the weather page in the LA newspaper every morning, it’s rare not to see an “R” next to Seattle, Portland and San Francisco, meanwhile South-

ern California and neighboring southwestern states are doing the rain dance trying to recover from five years of drought conditions. But because of that drought, if the rains come down in the southern part of California like they do up north, superintendents face dealing with potential mudslides and soggy, unmowable turf.

There’s not much you can do about the weather, but you’re either already familiar with or can explore potential problem areas on your course in the event of severe weather, heavy rains or prolonged freezing conditions. It may be too late to actually apply remedies for this year, but you can and should communicate potential crisis areas and possible solutions to your club leadership.

This is best accomplished by talking to a club member who “gets it” and is an ally, or at least a good listener, preferably one who is respected by his or her peers within the club. Don’t cry wolf, but rather talk about concerns you have, given the possible severity of the El Niño pattern this year and future events that could affect the club and the golf course’s viability and playability.

Of course you remember the old saying about the month of March: “In like a lion and out like a lamb.” Here’s hoping you can tame that lion at least a little bit and have a great spring!

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

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"Are you buzzing about 2016? You should be interested and invested in golf. This is a good year to do it. Go to a golf tournament. Any level works, even if it's where you work."

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

## It's time to get buzzed

**G**olf is great. Three simple words that can influence the way we feel about the sport, our jobs and the future. ¶ Can't you feel the buzz? ¶ Take the Official World Golf Ranking for example. Jason Day, Jordan Spieth, Rory McIlroy, Rickie Fowler and Bubba Watson make up the top five. Add two more Americans and the top 10 is loaded... USA, USA, USA!

Golf will be on display this year like it hasn't been in quite some time. In a seven-week period we will have three majors and an Olympic Championship. That's right. Golf is back in the Olympics for the first time since 1904. Oh, yeah... it's a Ryder Cup year, too!

Consider the golf courses for these events: The Masters at Augusta National, the U.S. Open at Oakmont, the PGA Championship at Baltusrol and the Ryder Cup at Hazeltine National. On top of that, we will be the first in several generations to see golf in the Olympics, and the course wasn't without some controversy. I'm sure we'll hear about it.

The top players in the world will showcase their

skills at all these events. At each one, there also is a superintendent-led staff and volunteers ready to showcase their abilities.

Not just majors, but all the PGA Tour events, Web. Com, USGA events, European Tour... you get me, right? Not just the professional tours, but everywhere.

The best in the world rely on golf course superintendents and their staffs to produce the playing surfaces they need to win. That simple. Same with my club and your club. We're relied upon to provide appropriate conditions.

I listen to my members talk about this upcoming golf year. They're buzzing about the same things. Upcoming events are filling up fast at the club. This time of year in

southern Florida there is a lot of golf being played. The pressure is on to deliver the conditions members expect.

At every superintendents meeting I attend, the talk always turns to the game (after the El Niño discussion). There is a buzz at these meetings just about playing this month's course or next month's site.

The GCSAA Championship was also on a lot of superintendent's minds. There was buzzing going on about San Diego. It's a shame everyone can't go to this event. No matter where it is, it's always buzzing there.

Golf course construction is back to buzzing, too. Contractors are busy. This is good. Many clubs in our area have been planning and waiting for

the right time to do this work. Clubs are opening their doors to reciprocate with each other.

Think of the trickle-down effect in our business. Equipment rentals, pipe and irrigation, grass, sand, you name it... buzzing.

How about you? Are you buzzing about 2016? You should be interested and invested in golf. This is a good year to do it. Go to a golf tournament. Any level works, even if it's where you work.

Play in a golf tournament. "Whoa, stop right there," you say, but the next local chapter event works just fine. Trust me, your local chapter will love to see you. Or maybe go to a local scramble at your church, or one that raises money for a good cause. Golf leagues are everywhere, and many are nine-hole events. Dust off those clubs.

Volunteer at a golf tournament. One tip here: Stick to what you do best. Don't get into transportation, food services or anything like that. Anything that keeps you near the action or gives you access inside the ropes will do just fine.

Find a way to get involved in a different way this year. Plan ahead, involve your family and friends. This will be a great year for golf and golf course superintendents. Get involved, help grow the game. Get the buzz.

Now if I could only get buzzed about the elections.

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

# My Second Office

BECAUSE THE COURSE IS YOUR FIRST

## About our host

It's a big year for Oakmont (Pa.) Country Club, but when we visited Superintendent **JOHN ZIMMERS JR.** last month for our U.S. Open preview story, the easy-going superintendent didn't make much of a fuss. "It's not that hosting these championships gets old, but once you've been through it, you know what to expect," Zimmers says. "It's about managing yourself through it, embracing it as an experience."

As a teaser for next month's U.S. Open preview story, we thought we'd ask "JZ" to give us a tour of his office. Some of his most impressive photos and honors couldn't fit into the picture, like photos of himself with George W. Bush, Jack Nicklaus and Arnold Palmer, his wife, Tracey, with the Stanley Cup, a thank-you letter from USGA Executive Director Mike Davis and a picture of his beloved dogs Diamond and Coleman.



**1 MR. 63** That's a 2007 Oakmont U.S. Open flag that Johnny Miller gave me. He put "63" in quotes, from when he won here and shot a 63 in the final round of the 1973 U.S. Open — he's quite proud of that. He did the broadcast (of the 2007 U.S. Open) and he has a love for Oakmont... he wanted us to know he was fond of the way the course played.

**2 STEEL CITY** This was given to me by NBC following the 2007 U.S. Open. When they opened the broadcast, they had a video

of a steelworker in a city steel mill making it... It weighs about a thousand pounds — I can't hang it. It took a couple guys to carry it in here.

**3 BLACK AND GOLD** The chair was given to me as a thank-you gift from a former assistant, Chris Markel. He knows I'm a big Steelers fan. People always comment about it when they come in my office.

**4 STRESS BALL** The baseball is from my grandma. She told me,

"When you're stressed, you always do best when the ball is in your hands." I haven't had to throw that ball yet.

**5 THE ORIGINAL JZ** This is a photo of my grandfather — whom I'm named after, he was senior and I'm junior — in his Army uniform. He taught me so much... my work ethic, my values. He went to war and came back, so when I'm having a bad day, I remind myself what he went through. I have the utmost respect for him, a great man, a great friend.

**6 THE KING AND I** I'll never forget this... that's a photo of Mr. Palmer and me, he has his hand on my shoulder. He told me, "Do what you do best, and let Oakmont be Oakmont." It was a special moment.

**INTERVIEW & PHOTO BY SETH JONES**

Proud of your second office? Email us a photo of you in it to [sjones@northcoastmedia.net](mailto:sjones@northcoastmedia.net), and we may feature you and your office in an upcoming issue of *Golfdom*.



# MERRILY THEY ROLL ALONG... DOWN THE FAIRWAY

And before long, you may be rolling, too

• BY ED HISCOCK •

It's said that sooner or later, everything old is new again. Whether you believe that or not (it's also said that 50 is the new 40), it just may be true for the practice of rolling golf course fairways. What had been an off again/on again cultural tool of the 20th Century appears to be a trend on golf courses of the 21st Century.

In the olden days (when 50 was still just 50), rollers had a place on fairways during construction, or maybe in the spring after a course had experienced winter frost heaving and needed to be smoothed out before the season's first mowing.

But the benefits of modern fairway rolling are starting to stack up. They include dollar spot suppression, less cutting time and the accompanying mower-wear reduction, and reduced fungicide applications.

## Roller redux

Sal Rizzo, founder of Cheshire, Conn.-based Salsco, which since 2012 has marketed the stand-alone Tranz-Former fairway roller (so named because it folds up – transforms – to go over narrow bridges to the next fairway), says the idea was brought to him by a superintendent.

"Matt Shaffer from Merion Golf Club (Ardmore, Pa.) asked if I had any interest in a new

project... He was looking for a machine to roll fairways... I gave him a machine that was wide enough to roll the fairway 10 feet wide and maneuverable enough to roll greens in under three minutes each."

The benefits, says Rizzo, who exhibited the Tranz-Former at the San Diego Golf Industry Show, are well understood. "Rolling grass has been around forever. It isn't new. It eliminates dollar spot, smooths the surface and improves the appearance of the fairway. Most superintendents will skip a mowing or two and roll instead. This can double the life of the fairway mowers. The savings, along with the savings of chemicals for dollar spot, will show a return."

But don't call it a trend, he says. "It is not a trend. It is here to stay. It improves the course while saving dollars. It is hard to think anyone would not be planning to start the practice of rolling the whole course."

*Continued on page 20*



PHOTO COURTESY EPIC CREATIVE





Fairway rolling, which has been a relatively minor golf course maintenance practice for decades, has been upgraded for the 21st Century. New rollers, and new reasons to use them backed by research, mean more superintendents are rolling fairways.



*Continued from page 18*

Offering another take on fairway rolling equipment — towed rollers — is Wayne, Pa.-based Smithco, which also exhibited in San Diego. The company's new five-gang Ultra 15 roller rolls a 15-foot swath, and at 10 miles per hour will roll 18 acres per hour, which Smithco President Don Smith says is three times faster than mowing. The company's year-old, three-gang unit, the Ultra 10, has a 10-foot swath and completes 12 acres at a 10-mile-per-hour pace.

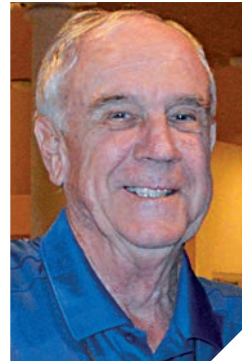
The company was drawn into the market two years ago after seeing a couple of models at the GIS. "After some preliminary research on the concept of rolling fairways," Smith says, "we decided to pursue a simple, cost-effective machine to accomplish the task. Not very many clubs have an extra \$45,000 to \$50,000 for this, nor that many extra fairway mowers that could be converted; not to mention the downside of using older machines that might be prone to hydraulic leaks. Our Fairway 10 Ultra came out of these discussions as a simple, affordable alternative to the market."

Smith's faith in that market is solid, and he notes that he has seen three or four other models at recent shows.

"Fairway rolling (now) is where greens rolling was in 1992," he says. "I can remember superintendents walking into the booth in New Orleans, looking at our greens roller and chuckling. A typical com-

**“ FAIRWAY ROLLING (NOW) IS WHERE GREENS ROLLING WAS IN 1992. I CAN REMEMBER SUPERINTENDENTS WALKING INTO THE BOOTH IN NEW ORLEANS, LOOKING AT OUR GREENS ROLLER AND CHUCKLING. A TYPICAL COMMENT WAS, ‘YEAH, I’LL ROLL GREENS. NEVER!’ LOOK WHERE WE ARE IN 2016. ”**

*Don Smith, President, Smithco*



ment was, 'Yeah, I'll roll greens. Never!' Look where we are in 2016."

### **What the research says**

An important aspect of golf course maintenance missing from fairway rolling in the days of yore is coming to the foreground in the new century: research.

Among the first turfgrass scientists looking into the practice are Geunhwa Jung, Ph.D., along with research assistant Jay Popko, at the University of Massachusetts-Amherst's Stockbridge School of Agriculture.

Preliminary results of their field studies are promising for superintendents currently rolling fairways and for those thinking about it. Jung says the practice has the potential of becoming a "game-changer" in the turfgrass industry because of "poten-

tial" physical changes in plants, thatches and soils and the microbial composition associated with them. These changes, he notes, may justify reevaluation of currently used cultural practices and chemicals.

"Our tests included rolling plots three times a week, four times a week, six times a week, and leaving some unrolled. We saw reduced clipping yield that positively correlated with increased rolling frequency," Jung says. "We also tested different fungicide spray schedules, and initial results indicate rolling can reduce the need for fungicide applications if superintendents use threshold-based spray programs. If we can confirm this with our second-year tests, this could save courses some money."

Jung and Popko also observed differences in the soil profile, and rolled treatments did not have a distinct thatch layer like the non-rolled treatment.

"We observed that the thatch layer has been pushed into the soil," says Popko,

**Tow-behind fairway rollers feature water tanks that allow superintendents to adjust the psi applied to turf.**



PHOTO COURTESY SMITHCO



According to Salsco founder Sal Rizzo, the benefits of rolling fairways, including reducing dollar spot, are well understood.

“and further tests are being completed to quantify the organic matter in the top of the soil profile.” Moreover, soil penetrometer tests “confirmed that rolled plots have higher resistance to penetration.” The soil profile alterations may lead to increased breakdown of the thatch layer or explain anecdotal reports from superintendents of increased driving distance on rolled fairways. In addition, the researchers say, future studies will examine ball roll in an attempt to quantify these observations.

At Michigan State University, Thomas Nikolai, Ph.D., has been looking at the effects of rolling greens since the 1990s, and he, along with graduate assistant Thomas Greene, have about three years of fairway rolling research under their belts. However, those studies were hampered by not actually having a fairway roller and hav-



ing to use a greens roller instead. Nikolai is now looking at three courses that are using Smithco rollers on fairways.

“I know of all the benefits on a golf course green because we’re rolling,” Nikolai says. “I know the difference in weight, and how it impacts the green. The fairways, we don’t know the answers to yet, and what we want the footprint of that roller to be.”

However, there are answers on some advantages. “Rolling on a green actually

changes the microbial population in the soil over time,” he says. “The change is probably the biggest reason why we see a reduction in disease. Research done by Paul Giordano here at Michigan State shows that we increased bacteria populations. Most bacteria are beneficial to our plant and antagonistic to fungi. That’s why rolling has that impact, and rolling more leads to greater water retention in

*Continued on page 22*

PHOTO COURTESY EPIC CREATIVE

The advertisement features a central image of a person in a dark jacket and khaki pants operating a red EarthWay broadcast spreader on a golf course. The spreader is dispensing a fine mist of material onto the grass. The background is a blurred green field.

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## // WHAT GOES AROUND, COMES AROUND

Continued from page 21

the soil. With greater water retention we get greater bacteria, and with greater bacteria we get less disease.”

With higher fairway mowing heights, greater thatch accumulation and different soil types, “we’re going to need a heavier roller,” Nikolai says, “but we don’t want the roller to weigh too much. What we still have to do with research is figure out how much. What’s the range we would like that roller to weigh, minimum to maximum?”

Nikolai’s current on-course research is looking to spot decreases in weeds and disease (mostly dollar spot), and increases in golfer satisfaction. He also notes that his previous research turned up no evidence that rollers transfer disease from one spot on the course to another, although “there are still more unknowns than knowns when it comes to the fairway.”

“If you have the time and have the machine, I would stop applying pesticides,” he suggests to superintendents. “I would pick two par 3s and roll half the fairway and not roll the other half. Do a little experiment. If you’re not getting results and you have something that you can add water to and increase the psi, I would put more water in the drum. Try to find the (correct) psi yourself.

“We’re getting there with research,” Nikolai says, but on some agronomic benefits, “the jury’s still out.”



According to Michigan State’s Thomas Nikolai, more research is needed to determine optimal weight for fairway rollers. “We don’t want the roller to weigh too much,” he says.

### Ask the man who owns one

On the superintendent side, one convert to fairway rolling is Tim O’Neill, CGCS at the Country Club of Darien (Conn.), and a former president of the GCSAA. O’Neill was an early adapter of Salsco’s Tranz-Former, which he’s had for about three years.

“Before I had the Tranz-Former,” he says, “I had the notion that having something to smooth out my fairways would be good, but it had to be something wider than a regular greens roller.”

As far as solid bottom-line results, O’Neill sees them. Saving mower wear and tear allows his mechanic to do other things, he says, “and in the summertime we can skip the middle mowing of the week when things are hot.” The fairway roller was what he was looking for, “because I actually had found myself trying to roll fairways with a small greens roller, which was ridiculous.”

In a bit of irony, the superintendent who once rolled fairways with a greens roller now rolls greens with a fairway roller. “I have small greens here,” O’Neill says, “so you wouldn’t necessarily think that you would put it on the greens, but for the amount of time we do it... I would say that the machine has a number of different benefits.”

One benefit O’Neill has heard about but not experienced is the reduction in fungicide use. “I’m on a pretty rigid spray program in the summertime,” he notes, “and I haven’t changed it at all because of the roller. But I’ve definitely found other uses for it.” Besides greens, he says, “we use it on the approaches. We use it in areas that may get damaged by vehicles, whether it’s trucks or whatever. After doing a lot of tree work this winter I’ll wait for the right moment, and when things are soft enough or firm enough... I’ll put that machine out there to roll it out and flatten some of the ruts.”

And what about the question of the more expensive stand-alones versus the less-expensive tow-behinds?

“I’m all for the whole notion of rolling,” O’Neill says, “and if you can get it done with those tow-behinds, OK. Whatever fits your budget, if you’re not so worried about tire marks. I like the ability to not have to tow this thing so that there are no wheel marks from a tractor or a heavy-duty utility cart.

“Quite honestly,” he says, “I’m thinking about putting another fairway roller on my equipment needs list, and that could be a three-year process to get it from where that would start to when I could actually get one.” ©

An advertisement for Plant Food Company, Inc. featuring a large green leaf with a yellow outline. The text reads "Premium Liquid Fertilizer" and "Experience The Difference". Below the leaf is the company logo, a website URL "www.plantfoodgolf.com", and a phone number "800-562-1291 | pfc@plantfoodco.com". There are also images of fertilizer containers and a sprayer.



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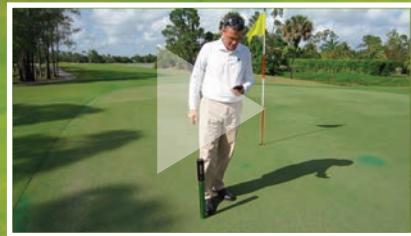
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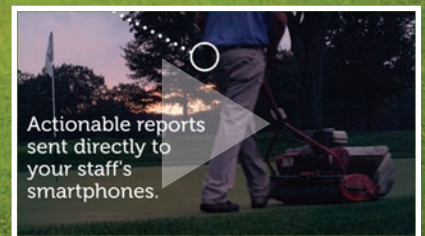
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# Short and



**No. 11** at Bandon Preserve  
at Bandon Dunes Resort in Bandon, Ore.

From coast to coast and for golfers rich and poor,  
par-3 courses are short on yardage but long on value.

— BY JOHN WALSH —

**W**hether it's the attention of the par-3 contest at Augusta National during the Masters Tournament or special events at a local unsung course, par-3 courses are a valuable part of the industry. They help introduce the game to children, allow avid golfers to practice their short game or squeeze in a few holes, and raise money for environmental causes.

We found three courses that exemplify the versatility of the short courses' popularity, each special and important in its own way. Button Hole in Rhode Island, Bandon Preserve in Oregon and Vestavia Country Club in Alabama are three courses that prove that size doesn't matter.

PHOTO BY: WOOD SABOLD



# Sweet



## Off the street and onto the green

Button Hole, located in Providence, R.I., is a non-profit initiative with a noble cause: to enrich the lives of youths by providing facilities and programs that develop strong character, teach values and champion success through golf. Young people learn lessons about honesty, humility and perseverance while gaining respect for the environment and their neighborhood.

Prior to becoming a par-3 course, the 26-acre site was a crime-ridden eyesore in the middle of two housing projects, a sand pit rutted by dirt bikes and littered with junk cars. In 1997, David Fay, former executive director of the United States Golf Association, suggested building a short course for kids in Rhode Island.

The Rhode Island Golf Association donated \$5,000 for the initial feasibility study, the state gave a preliminary 99-year lease for \$1 a year, the USGA committed \$220,000 to the project and the USGA Foundation and builder Jack Marshall donated funds to the project.

Opened in 2001, Button Hole has now touched the lives of more than 15,000 kids. The course sees 9,000 rounds a year. The facility is open to the public, but closes in the afternoons for after-school programs.

*Continued on page 26*





The land for Button Hole, Providence, R.I., was reclaimed from an old junkyard.

**“Conditions aren’t too difficult, but they’re not neglected either. We cater to the kids so they can have a good round.”**

*Continued from page 25*

Button Hole Superintendent John Rourke says the facility focuses on inner city kids.

“We teach them something constructive,” Rourke says. “We’re also increasing the number of golfers by teaching those who would never have gotten into it.”

Rourke, 36, in his third year at Button Hole, came from the private Agawam Hunt Club in Rumford, R.I. But he likes Button Hole’s concept.



**John Rourke**

“The nonprofit status took me away from the exclusivity of golf,” he says. “It’s taken me away from working with just one group of people.

This job is more fulfilling than just helping rich guys improve their handicap. This pay scale is much different compared to where I was, however, there’s more structure here and a different kind of conditioning. I can also bring my son to work, and I’m more accessible. This isn’t a 24-hour-a-day job.”

Before Rourke’s time at Agawam he worked for a regional management company, building and maintaining a lot of golf courses.

“I got divorced and became ill because I was a workaholic,” he says. “I learned the hard way.”

Rourke has no staff during the winter. In season, he has a crew of five that helps maintain the 26-acre facility, which includes a driving range. Rourke has been involved with

restructuring maintenance practices and creating a feasible budget for the property.

“Last year, not much was done agronomically; maybe one fertilizer application and one insecticide application,” he says. “But this year, we have a new board. We’re in transition. We have a lot of repair work going on, and we’re getting back to normal.”

Rourke follows a more sustainable maintenance program, maintains higher heights of cut and hand-waters more, which gives him more control. He uses as many native plants as he can and returns nutrients to soil via grass clippings. He also uses volunteer labor, and works with chemical companies that give money to the facility or donate product.

“We do that with everything,” he says, adding that he relies on the Rhode Island Golf Course Superintendents Association to help get donations and used equipment.

Even though Button Hole’s conditions aren’t maintained at the same level as Agawam’s, they’re consistent.

“We want to make sure quality and conditioning is at the beginner level,” Rourke says, adding that a consulting firm helps determine conditions. “Conditions aren’t too difficult, but they’re not neglected either. We cater to the kids so they can have a good round.”

### **Giving back to Mother Nature**

On the West Coast, there’s Bandon Preserve, a 13-hole par-3 course that’s part of Bandon Dunes Golf Resort in Bandon, Ore. Opening in 2012 and designed by Bill Coore and Ben Crenshaw, Bandon Preserve begins atop a sand dune and rolls down toward the beach. The Pacific Ocean provides the backdrop to every hole. It’s a true links course.

“It’s phenomenal par-3 ground,” says Ken



**Ken Nice**

Nice, director of agronomy at Bandon Dunes. “When we built the course we weren’t married to 13 holes. We just said, ‘Let’s build the most par-3 holes we can.’

“We’re committed to true links golf,” he adds. “All of the courses were seeded to fine fescue, which means fewer inputs. For example, we’re

below 2 pounds of nitrogen per 1,000 square feet. We spoon feed, and there's no runoff."

The construction method of Bandon Preserve was identical to that of the facility's Old MacDonald course, which has sandy soils that drain well.

Bandon Preserve is different from the other Bandon Dunes courses in that all net proceeds go directly to the Wild Rivers Coast Alliance (WRCA), an organization that supports conservation, community and the economy on the southern Oregon Coast. WRCA was founded by businessman Mike Keiser, owner of Bandon Dunes Golf Resort. WRCA was formed through discussions about the needs and opportunities for philanthropic investment in the area with representatives from the community, the nonprofit sector, business and local government.

"Mike Keiser has always been philan-

thropic," says Jim Seeley, executive director of WRCA. "He wanted to start a philanthropic organization and had been working on that three years before WRCA was hatched."

Since the Preserve opened, it — along with Keiser's contributions — has generated \$2 million for WRCA. The Preserve's in-season rate is \$100 per round.

WRCA has done a lot of work to promote tourism and improve water quality and the economics of the fishing industry. It was a catalyst in gaining approval for the Wild Rivers Designated Scenic Bikeway, the first and only such bikeway on the Oregon coast.

The Preserve also supports an en-



**Jim Seeley**

dangered plant species called the silvery phacelia. The population of silvery phacelia on the three other courses isn't as concentrated as it is on the Preserve. Construction of the Preserve, rather than reducing the silvery phacelia, actually has facilitated its recovery. "We've done everything to enhance the plant so it can thrive," Nice says. "It's tripled in numbers since we opened the course."

Every course at Bandon has its own staff and a budget based on square footage, and they operate within that. "We treat the Preserve with every bit of scrutiny as the other courses," Nice says.

The Preserve, which has received high ratings from guests, is different in another way: The resort allows groups of eight to play at one time. "That's a unique aspect of that course, and people love it," says Nice, who oversees a staff of about 100.

*Continued on page 28*

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Vestavia Hills' par-3 course shares its original designer with Augusta National's par 3, George Cobb.

*Continued from page 27*

Groups that arrive in late afternoon and don't have enough time to play 18 holes can play that afternoon on The Preserve. "It's a good precursor to what guests will experience at Bandon Dunes," Nice says. "Or, for those who have played all day, they can squeeze in another 13 at the end of the day."

**"People can come after work and play the par-3 course in as quick as 45 minutes," says Coulson.**

### **Fun for everyone**

Nestled atop the mountains of Vestavia Hills and spanning more than 176 acres, Vestavia Country Club in Birmingham, Ala., began as a successful riding club in 1948 and opened to members in 1950. In addition to the 6,811-yard, 18-hole course with six different tee boxes to accommodate all skill levels, the club features a 9-hole par-3 course which sports MiniVerde ultradwarf bermudagrass greens and three sets of tees. George Cobb, designer of the par-3 course at Augusta National, originally designed the course in 1954.

Neglected for years, the course was renovated in 2011.

"Before the course was renovated, it was a ghost town," says Owen Coulson, superintendent at Vestavia. "Some members practiced on it, but nobody really cared about it. We barely maintained it, but it's the main thing you see coming into the club."



**Owen Coulson**

The par-3 course at Vestavia Hills hosts various events for its membership.

The golf course architect firm of Schmidt-Curley redesigned the course and Landscapes Unlimited rebuilt it. The impetus for the \$400,000 renovation was that the club was deciding what it wanted to be — a middle-of-the-road club, or the best.

"It chose the best," Coulson says, adding the club renovated the pool and tennis clubhouse in addition to the par-3 course. "Those three are best in the region."

Coulson says different kinds of golfers play the par-3 course — young kids, those who don't have the time to play an 18-hole round, older golfers, those just looking to practice, middle-schoolers... everybody.

"People can come after work and play the par-3 course in as quick as 45 minutes," says Coulson, who has been at Vestavia for 13 years.

Vestavia has a lot of fun with its par-3 course. It hosts special events such as a progressive dinner. The dinner, which sells out on the first day tickets are available, starts in the late afternoon. On the different holes, 50 couples enjoy appetizers, drinks and dessert and a bonfire at the end of the round.

The course also hosts night golf, outside events, happy hour (a bar or station is set up on every green), music events (bands set up on the tee boxes), campouts for kids and weddings, for which the club is known.

"It's a unique and fun piece of property," says Coulson, adding the conditions are the same as the big course. "We treat it like a championship course." ©



PHOTOS COURTESY OWEN COULSON





# Super Science

## // STRESSFUL STUDY

### SOIL SURFACTANT IMPROVES PERFORMANCE OF GREENS UNDER STRESS

By Kevin Laskowski, Kevin Frank, Ph.D., and Emily Merewitz, Ph.D.

**C**reeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) are important putting green turfgrass species that are sensitive to drought and traffic stress. The objective of this study was to investigate whether a soil surfactant, Revolution, would positively impact drought and traffic tolerance in grass species on a putting green built to USGA recommendations.

Revolution was applied as a foliar spray at 6 fl. oz./1,000 sq. ft. to creeping bentgrass Penn-A4 and annual bluegrass under three target soil-moisture

percentages (8 percent, 12 percent and 16 percent) based on the Rainbird TSM-1 soil sensors in a two-year field study. Golf course traffic was applied through the use of a Mayes traffic simulator to represent low (5,688 rounds of golf), moderate (11,376 rounds) and no traffic (control) that could occur on a golf course putting green in one season.

The effect of Revolution on turfgrass quality, normalized difference vegetation index, soil moisture and percent localized dry spot coverage was measured. Revolution-treated turf that received the least amount of irrigation (8 percent) held more moisture than control plots (plots not treated with Revolution). The high irrigation (16 percent) Revolution-treated

plots held less moisture than control plots. Plots treated with Revolution also maintained better quality than control plots. The results of the study show that Revolution can increase turfgrass quality, increase normalized difference vegetation index, decrease localized dry spot by increasing soil moisture when water is insufficient and decrease soil moisture when water is excessive.

Kevin Laskowski, M.S. candidate, Kevin Frank, Ph.D., and Emily Merewitz, Ph.D. are at Michigan State University. Kevin Laskowski can be reached at [laskow29@msu.edu](mailto:laskow29@msu.edu) for more information.



**A.** Soil surfactant-treated plot with localized dry spot surrounding. **B.** Untreated plot displaying severe localized dry spot.

## NEWS UPDATES

### GCSAA TO SUPPORT SEVEN NEW RESEARCH PROJECTS IN 2016

Seven new research projects will receive funds provided by a block grant from the Environmental Institute for Golf (EIFG), the Golf Course Superintendents Association of America's (GCSAA) philanthropic organization.

Four of the projects are part of GCSAA's Chapter Cooperative Research Program. Researchers can apply for this program after a participating GCSAA chapter identifies it as "a significant local issue" for superintendents and then donates funds for support. The four new studies were funded based on recommendations by the GCSAA Research Committee and approved by the association's board of directors.

The three additional grants are through other specific EIFG programs, including the Dr. Michael Hurdzan Endowment (focused on environmental research with the goal of reducing requirements for water, fertilizer, pesticides or fossil fuels in golf course maintenance); the Aquatrol's Robert A. Moore Endowment (focused on applied research for optimizing the growing environment for golf course turf, while minimizing inputs of water, fertilizer and pesticides); and the Mark Kizziar Research Grant (focused on optimizing water use on golf courses).

GCSAA is continuing to support 10 projects that were selected for funding in 2012, 2014 and 2015.

**OVER-REGULATION OF TURF CAN RESEMBLE OTHER TYPES OF STRESS AND OFTEN IS CONFUSED WITH DISEASE."**

**Bill Kreuser, Ph.D.**  
(see story on page 30)



## // LOOKING AT GDD

# The perils of PGR over-regulation

By Bill Kreuser, Ph.D.

**T**he benefits of plant growth regulators (PGRs) have been touted for decades and with good reason. Research shows that PGRs can reduce clipping yield, increase turf quality and performance and improve stress tolerance.

To sustain these benefits, growth regulators need frequent re-application throughout the year. As a result, many superintendents have tightened their application intervals down to a week or less during the summer. Most will also use a lower application rate to increase safety. Other superintendents like to combine different stand-alone PGR products to increase control and provide greater safety. While the concepts are sound, these PGR programs can result in too much of a good thing: PGR over-regulation.

Can turfgrass be over-regulated by gibberellin-inhibiting PGRs, and what does that really mean? It depends on the demand of the turfgrass stand. For example, turf grown under a fence line or around tree bases typically has lower demands for quality and performance. It just needs to look decent and grow slowly to reduce the need to string trim.

On the other hand, a golf putting green needs some amount of daily growth to recover from traffic, disease or other pest damage. In these cases, too much growth suppression from a PGR can limit recovery and lead to undesirable turf quality and performance. Too much growth suppression also can cause mild discoloration (phytotoxicity) and even segregation of grasses like creeping bentgrass and annual bluegrass, which also is undesirable. This would be a case where PGRs are over-regulating turf growth.

**FIGURE 1**



The foreground shows an annual bluegrass/creeping bentgrass green treated with both Trimmit (2 oz./acre) and Primo Maxx (6 oz./acre) every five to 10 days. The background section of the green had the same maintenance but did not receive the PGR mix. The turf in the foreground has typical signs of PGR over-regulation, including patches of discolored turf, leaf segregation and worn-leaf tips.

### A CASE STUDY OF OVER-REGULATION

Over-regulation of turf can resemble other types of stress and often is confused with disease. The turf has a blue-brown color and putting greens have a patchy appearance. On closer inspection, the leaves generally are free of lesions but have a worn appearance with brown, shredded leaf tips. Occasionally, leaves will have lesions from diseases like dollar spot or leaf spot. Last summer I was asked to visit several golf courses with these symptoms, and it was obvious that something wasn't quite right. Fortunately for me, one of the courses with these symptoms was helping the Nebraska Turf Program with a PGR interseeding study.

As part of the study, half of the No. 2 green was not treated with a PGR except for inside the study area. The superintendent would first spray our research area with his normal mix

(fertilizer, fungicide, etc.), then would add the PGR mix and spray the rest of his greens. In essence, half of his No. 2 green was a great no-PGR check plot.

It was clear that his PGR program was the culprit. There was a stark line between the treated and non-treated part of this green (Figure 1). Different biotypes of annual bluegrass and creeping bentgrass ranged in color from greenish brown to blue-green. The non-treated side had a bunch of annual bluegrass seedheads, while the seedheads on the treated side were still buried in the canopy and emerged several weeks later.

What was the superintendent spraying to get this response? The superintendent was mixing paclobutrazol at the low-labeled rate with the standard rate of trinexapac-ethyl. I was applying similar rates of both products alone and didn't see the response. It could have been the mix, because mixing the PGRs increases the amount of



growth suppression in our research. Still, we rarely see that type of discoloration when we mix paclobutrazol and trinexapac-ethyl. I asked the superintendent about the re-application interval. He wasn't using growing degree day (GDD) models and he was re-applying PGRs every five to 10 calendar days. That was the biggest clue, because our research shows that tightening the re-application interval can strengthen growth suppression.

**RE-APPLICATION INTERVAL AFFECTS PERFORMANCE**

The goal of a successful PGR application program is to maintain enough PGR in plant to slow biosynthesis of gibberellin, the plant hormone that accelerates leaf elongation, for the entire growing season. Think of a biosynthetic pathway like a river. Place a dam on the river and it stops downstream flow. A PGR is applied to turf, it dams up the gibberellin biosynthetic pathway and reduces leaf elongation. Repeated applications of PGRs are required because PGRs are broken down over time. This process is dependent on temperature; doubling the air temperature (degrees Celsius) roughly doubles the rate of breakdown. This means that scheduling PGR re-application intervals with a calendar is extremely inefficient because the ideal interval changes with the weather.

An alternative approach to a calendar-based schedule is to use GDD thresholds. A GDD system for PGRs is simply a way to calculate how much heat has been accumulated since a PGR was last applied. Growing degree days are calculated by adding together the daily average temperature (Celsius with a base temperature of 0°C) from the first day the PGR is applied until a re-application threshold has been surpassed. The ideal re-application intervals for trinexapac-ethyl and paclobutrazol on cool-season greens are 200-230 and 270-310 GDD, respectively. When mixing PGRs, use the ideal re-application from the product

that lasts longest. That means the ideal re-application interval for the golf course that mixed trinexapac-ethyl and paclobutrazol should have been roughly 300 GDD. That is roughly 20 days in spring and 10 days or less during summer. Again, the superintendent was applying every five to 10 days, or double the frequency required. This can have a huge impact on the amount of PGR inside the plant.

**SLOW PGR ACCUMULATION**

Superintendents can use the same GDD system that helps schedule PGR applications to roughly estimate the amount of PGR inside the plant. The ideal interval for trinexapac-ethyl and paclobutrazol is equal to two half-lives. A half-life is the time it takes for half the PGR to break down inside the plant. That means 50 percent of the trinexapac-ethyl applied to a cool-season putting green is broken down by 100 GDD. After two half-lives (200 GDD) only 25 percent of the product still is active

in the plant, and growth suppression starts to wane. Our PGR GDD research shows that rate has minimal impact on the ideal re-application interval.

On cool-season greens for example, the high rate of paclobutrazol, 16 fl. oz. Trimmit/acre, only increased the ideal re-application interval 40 GDD compared to the low rate, 5.5 fl. oz. Trimmit/acre. That's only 1.5 calendar days of control but three times the active ingredient when the high and low air temperatures are 90 and 70°F, respectively. That same result applies to all the PGRs we've tested. The amount of suppression increases with higher rates for most products or when products are mixed, but not the longevity of control. Typical GDD re-application intervals and the relative growth suppression for cool-season greens are summarized in Table 1.

The half-life concept helps explain why application rate has a minimal impact on PGR longevity. Another

Continued on page 32

**TABLE 1**

		Relative Growth Suppression		Ideal Reapplication Interval (GDD)	
Common Name	Active Ingredient	Low Rate	High Rate	Low Rate	High Rate
Primo Maxx	Trinexapac-ethyl	20%	20%	230	230
Trimmit 2SC	Paclobutrazol	30%	50%	280	310
Cutless 50W	Flurprimidol	20%	30%	210	270
Anuew	Prohexadione-Ca	25%	25%	280	280
Legacy	Flurprimidol + Trinexapac-ethyl	20%	35%	270	300
Musketeer	Flurprimidol + Paclobutrazol + Trinexapac-ethyl	25%	40%	290	290

The impact of PGR active ingredient and application rate on the magnitude and ideal re-application interval (Celsius, base 0°C) for cool-season putting greens. The low- and high-labeled rates represent the lowest and highest application rate specified by each product label for cool-season greens.

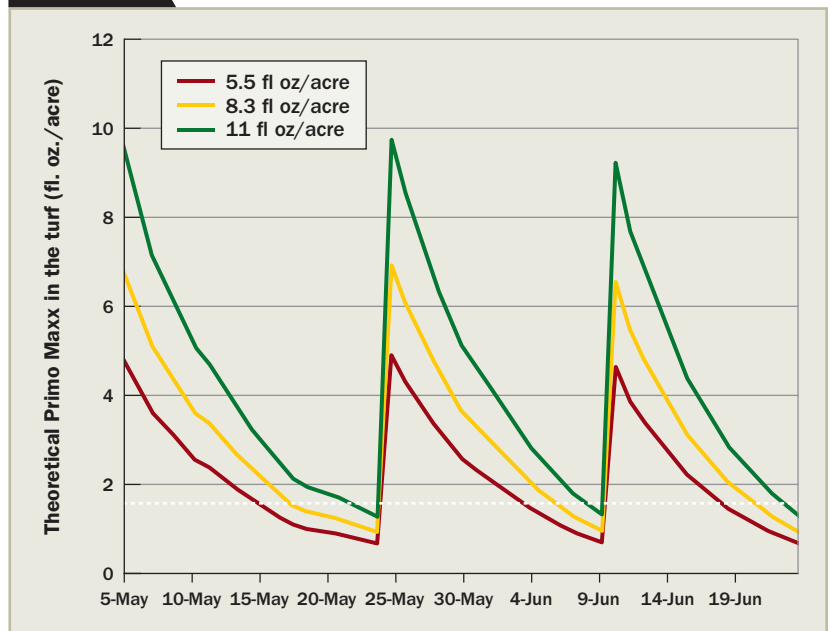
Continued from page 31

example, the Primo Maxx label, allows for application rates ranging from 5.5 to 11 fl. oz./acre (0.125 to 0.250 fl. oz./1,000 ft<sup>2</sup>). Figure 2 shows how much theoretical Primo Maxx is in the turf plant based on real weather data from our research station in Nebraska. The red line indicates the low rate and the green line indicates the high rate of Primo Maxx in the plant. The white line is the critical amount of PGR required to suppress growth. Notice how the big differences in Primo Maxx quantity quickly decay and begin to converge together at the white critical point line. Also notice that the Primo Maxx quantity decays faster in June than May because it was cooler in late May. It's clear why increasing application rate has a minimal impact on PGR longevity. It's more important to apply more frequently (at two half-lives) to maintain growth suppression.

The half-life concept also explains how applying PGRs too frequently can lead to an accumulation of active ingredient in the plant tissue, even at low application rates. Let's tweak the thought experiment from the previous paragraph.

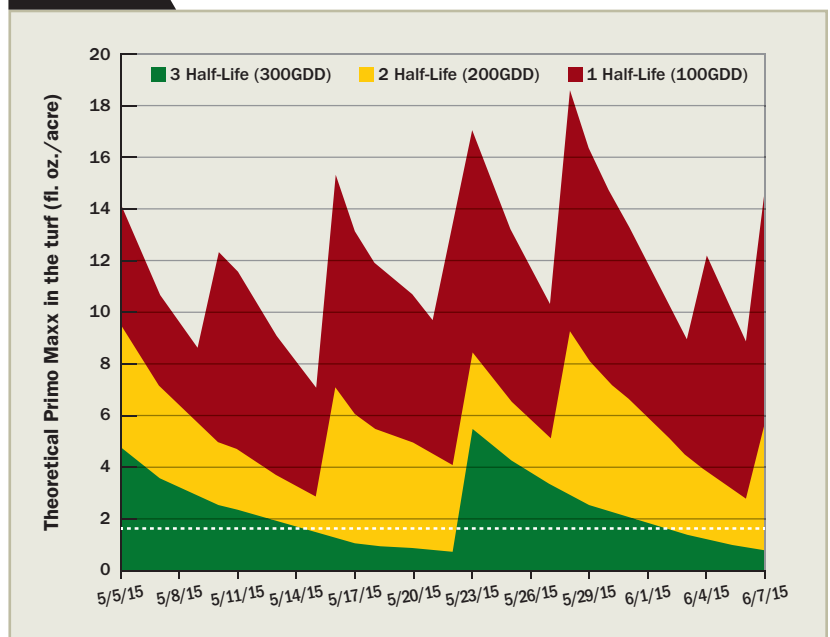
Instead of three Primo Maxx application rates, we'll re-apply the 5.5 fl. oz./acre rate every 100, 200 or 300 GDD (one, two or three half-lives). The 200- and 300-GDD intervals causes the amount of Primo Maxx in the plant to increase to roughly 5.5 oz./acre immediately after application, but the Primo Maxx in the 300-GDD interval drops below the critical value (Figure 3). This interval doesn't sustain growth suppression. The 100-GDD interval does the opposite. That interval causes the amount of Primo Maxx to increase in the plant. After a couple re-application cycles, the amount of Primo Maxx in the turf is double the amount that would be in the plant if it were re-applied every 200 GDD, two half-lives (Figure 3). This happens because Primo Maxx is being applied

**FIGURE 2**



The impact of application rate on the longevity of Primo Maxx in a cool-season putting green outside Mead, Neb. The dashed yellow line represents the critical level where growth suppression starts to wane.

**FIGURE 3**



The influence of re-application interval on the amount of Primo Maxx in a cool-season putting green outside Mead, Neb. Re-applying every two half-lives maintains consistent levels of Primo, while the three half-life interval doesn't sustain sufficient Primo Maxx to sustain suppression and the one half-life interval leads to Primo accumulation in the plant. This can result in deep growth suppression and the potential for over-regulation.



faster than it's being broken down. It's analogous to filling a bucket with a hole in the bottom. If the amount of water poured into the bucket is equal to the amount coming out of the hole, then the water level in the bucket will not change. If the amount of water pouring into the bucket is increased, the water will flow out of the hole slightly faster as the water level in the bucket rises. This essentially is what happens with any PGR applied sooner than two half-lives. It explains why the Nebraska golf course experienced over-regulation. They were applying roughly twice as often as needed. This led to deep and sustained growth suppression.

### ULTRADWARF BERMUDAGRASS OVER-REGULATION

Until now, I've only referenced cool-season turf at putting-green height. That's because the data set for that species and environment is the most complete. Early research shows that bermudagrass greens are much more sensitive to PGRs than cool-season greens. The amount of growth suppression and longevity of control is enhanced in bermudagrass. Research is under way to understand which GDD threshold and which base temperature is most appropriate for bermudagrass. While the exact thresholds need to be experimentally determined, the concept about half-lives and PGR accumulation will hold true. Many ultradwarf managers apply Primo Maxx at low rates (2 fl. oz./acre) as frequently as every four days. While that application rate may seem safe and low, it is extremely likely that every four days is less than one half-life. After a couple applications the amount of Primo in the plant starts to accumulate and the risk of over-regulation starts to increase.

### GDD MODELS REDUCE OVER-REGULATION

Over-regulation of turf with PGRs can be a real issue, even at low application rates. It often can be confused with

disease and intensifies damage from pests and traffic. The best way to sustain season-long growth suppression while avoiding too much growth suppression is to embrace GDD model thresholds to schedule PGR applications. The Nebraska Turf Program has an Excel-based program to help keep track of GDD for cool-season greens (<http://turf.unl.edu>). We've also released a web-based app called GreenKeeper that automatically downloads weather data, calculates GDD and estimates growth suppression for all cool-season turf areas. It's available free at [GreenKeeperApp.com](http://GreenKeeperApp.com). Several other research labs are working hard to determine GDD thresholds for warm-season species under different growing environments. We're looking forward to incorporating those model data into GreenKeeper next season.

It's important to understand how PGR re-application intervals and half-lives impact growth suppression. If over-regulation is suspected, stretch out your re-application interval to promote turfgrass recovery. A successful PGR program maintains uniform levels of PGR in the plant throughout the growing season. It maximizes the benefits associated with PGR use and minimizes the risk of too much growth suppression.

**Bill Kreuser, Ph.D., is an assistant professor and Extension turfgrass specialist at the University of Nebraska-Lincoln. He can be reached at [wkreuser2@unl.edu](mailto:wkreuser2@unl.edu) for more information.**

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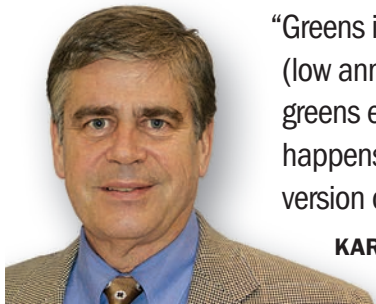
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"Greens in the fall may appear relatively clean (low annual bluegrass populations), but once greens emerge from winter something happens — a breakout of a putting green's version of acne: annual bluegrass patches."

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

## Spring colors

**O**f all the seasons, spring is where we see the greatest differences in growth and color among the turfgrass species caused by weather. Greens often appear as a patchwork of colors expressed by different turf species and individual populations of the same species.

Annual bluegrass (*Poa annua*), with its vibrant light-green to green color, is in stark contrast to the semi-dormant to bluish-colored creeping bentgrass. The vibrant color of annual bluegrass occurs in part because it initiates growth sooner than creeping bentgrass. Most shocking is where all these brilliant green patches came from. They sure were not obvious late last summer or through the fall.

Annual bluegrass is a winter annual. Seed germination begins mid-fall, which often is visually difficult to detect. Greens in the fall may appear relatively clean (low annual bluegrass populations), but once greens emerge from winter something happens — a breakout of a putting green's version of acne: annual bluegrass patches.

The common reason given for this is that annual bluegrass colonizes ball marks. However, ball marks are not evident on many of these greens. Researchers at Auburn University, in addition to looking at optimum temperatures for annual bluegrass germination (the annual type), investigated the

impact of photoperiod. When analyzed across temperature treatments, they reported that annual bluegrass could germinate in complete darkness at a level relatively close to that observed under light. Although most weeds that produce small seeds need light to germinate, one weed — *Poa annua* — apparently does not. Although not the only factor (and disturbance is still important) the ability to germinate under a dense turf canopy is a competitive advantage of annual bluegrass.

The good news is that the appearance of "overnight" annual bluegrass in the spring usually leads to a quick disappearance in the summer. Although summer temperatures are stressful to creeping bentgrass, the stress is not as severe in comparison to annual bluegrass. Creeping bentgrass often outcompetes or crowds out annual bluegrass. It's fascinating that annual bluegrass is extremely competitive against creeping bentgrass under spring temperatures but that the roles reverse under summer temperatures.

Spring purpling of creeping bent-

grass is caused by anthocyanin production. Anthocyanin production, expressed in the form of bluish-to-purple leaf color, is a sign of stress. The expression of anthocyanin is driven by spring weather conditions, typically cool day and night temperatures, but always associated with increasing day length and increasing light intensities. Anthocyanins are produced to help protect newer leaf tissue from these changing environmental conditions.

Preliminary greenhouse studies here at The Ohio State University by David Gardner, Ph.D., and graduate student Dominic Petrella found that creeping bentgrass cultivars vary in the speed in which they produce anthocyanins in response to a stress. So if anthocyanin production seems excessive during spring, especially if pesticides also have been applied, you could be dealing with one cultivar that responds at a faster rate than another. Once the stress dissipates and the plant begins to grow, the normal green color will appear.

The combination of off-color or purple creeping bentgrass and much slower growth compared to annual bluegrass often drives superintendents to attempt to stimulate color and growth through elevated nitrogen applications. This is a mistake. Creeping bentgrass will start growing when it feels like it. Don't push it. Excessive nitrogen in spring will lead to problems later in the year.

Although a natural cycle, the difficulty with spring color is that golfers want perfectly smooth green putting greens on the first day that temperatures rise into the mid-60s. Golfers don't want to wait, and they sure don't want to hear that the best thing we can do is nothing, just let warmer temperatures take care of spring colors. However, that is exactly what we should do.

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).



# Nimitz Pro G

## A New Nematicide for Turf

Marie Knox is a nematologist and technical manager for Control Solutions, Inc. She has extensive research experience in developing new products for pest management, including turf. Marie can be reached at [mknnox@controlsolutionsinc.com](mailto:mknnox@controlsolutionsinc.com) for more information.

### **Q**Tell me a little about fluensulfone, the active ingredient in Nimitz Pro G.

Fluensulfone was discovered in Japan and has been in thousands of agriculture-use studies in 23 countries. It has been studied for use in turf since 2008. From these studies we have learned that the granular formulation provides the best safety for turf combined with the best efficacy. Nimitz Pro G will be sold by Quali-Pro.

### **Q**What nematode species are controlled by fluensulfone, and what is the mode of action?

Sting, lance, lesion and root knot nematodes are all controlled by fluensulfone. The specific mode of action is still being determined, but we do know that nematodes that feed on treated turf become paralyzed and have impaired mobility within 24 to 48 hours of feeding. This condition is irreversible, making Nimitz Pro G a true nematicide.

In addition, fluensulfone disrupts the development of eggs in females. In some

cases, no viable eggs will be produced, and if eggs are produced they may not hatch, or if they do hatch, the juveniles will be impaired.

### **Q**What application strategy is recommended for controlling nematodes?

The most effective control strategy our research has developed is to apply 80 pounds of product per acre once a month for three consecutive months. The yearly maximum amount of Nimitz Pro G that can be applied in a year is 240 pounds of product per acre. We also suggest grooming or aerifying a green 10 days prior to product application to improve control.

The product should be applied only after the soil temperature has consistently reached 55 degrees F or greater so the nematodes are active when the first application is made. The month of year the first application is made varies by location and site history of damage by nematodes.

Nimitz Pro G can be applied either preventively or

curatively. In either case, the best application strategy is to apply the product at 80 pounds per acre once a month for three consecutive months.

plied using a drop or rotary spreader and watered in after application. After watering in has been completed, golfers can play on the treated areas.

**NIMITZ PRO G SHOULD BE AVAILABLE IN MAY 2016. WE HAVE SEEN POSITIVE PLANT HEALTH BENEFITS FOLLOWING APPLICATION, INCLUDING INCREASED COVERAGE OF GREEN TURF, INCREASED ROOT LENGTH AND DENSITY AND AN OVERALL IMPROVEMENT IN PLANT HEALTH.**

To date, no enhanced microbial degradation or nematode resistance to the product has been observed in research experiments or by end users in agriculture crop use.

### **Q**Are there any environmental concerns our readers should be aware of?

The pending label carries a "Caution" signal word. No setbacks or buffers around water are required, and there is no impact on honey bees. There is no reentry restriction. The product has a favorable ecological toxicity profile.

The personal protective equipment for applicators is long pants, long-sleeved shirt, socks, shoes and gloves. The product is ap-

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

Nimitz Pro G should be available in May 2016 pending final approval by federal and state agencies. We have seen positive plant health benefits following application, including increased coverage of green turf, increased root length and density and an overall improvement in plant health.



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

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



## Jon Lobenstine

**DIRECTOR OF AGRONOMY** // Montgomery County (Maryland) Revenue Authority

**What can I get you?** I'll do a Tito's and pink lemonade.

**Tell me about your family.** We have a blended family. I have two girls, ages 10 and 12. Crystal has three boys, ages 7, 10 and 12. The way I look at it, we're fielding our own basketball team.

**Speaking of sports, who are your teams?** I'm a diehard Redskins fan, a lifelong Orioles fan and if I'm watching college sports, I'm watching the Jay-hawks.

**When were you at Kansas?** From '91 through '95, then I spent my last semester studying abroad at the University of Costa Rica. My degree from Kansas is in Spanish. And I did the Penn State World Campus for turf in 2002.



**We just missed each other at KU. How did you like living in Lawrence?** I always thought that the town of Lawrence is an oasis of the Midwest, from the variety of the topography to how cool the people are. There was a cool grunge/hippie music scene going on when I was there. The people are warm and there was never a shortage of parties.

**I bet that degree in Spanish has been helpful.** Most of our crew are Hispanic guys. I've gone through over the

**"I THINK THE MOST SATISFYING THING IS PROVIDING COUNTRY CLUB-LIKE PUTTING GREENS FOR THE \$15 TWILIGHT GOLFER. THERE'S SOMETHING SATISFYING ABOUT GETTING THE BLUE COLLAR GUYS A NICE ROUND OF GOLF."**

years and translated our employee handbook, the forms we use on a daily basis...

**OK, give me a good phrase you like to say to the crew.** *Hazlo con ganas hoy, señores!* 'Do it with enthusiasm today, guys!' You've got to get these guys pumped up and out the door.

**What's your favorite vehicle you've ever owned?** I'm driving it now. A Taurus SHO. At work I'm all about operating with efficiency; I guess you could say I like driving with efficiency as well.



**Tell me something that's on your bucket list.** I've had the opportunity to visit a lot of different countries in Central America, Europe, the Middle East. One of the things on my bucket list is to go back to those places and share those experiences with the kids.

**Fill in the blank: I know a person is a true turf professional when I see \_\_\_\_\_.** When I see him or her excelling at what they do on the golf course, but then openly sharing that for the betterment of all of the turf world. Social media is beginning to rapidly excel our profession, and it's leading us to great places. I think the best turf professionals are kicking ass, and they're sharing it with the world so the rest of us can keep up.

As interviewed by Seth Jones, March 22, 2016.



# RG3

**INNOVATION THAT DELIVERS**



"The RG3's impact to our putting greens has exceeded my expectations. We are achieving higher clipping yield, more consistent greens speeds, and smoother putting surfaces with less manpower. It's a win-win scenario."

– John Shaw, CGCS, Valley Brook CC

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