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– Thomas A. Nikolai, Ph.D., College of Agriculture Michigan State University

Although the study is preliminary and far from complete, there are significant indications that:

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- Moisture retention is maintained
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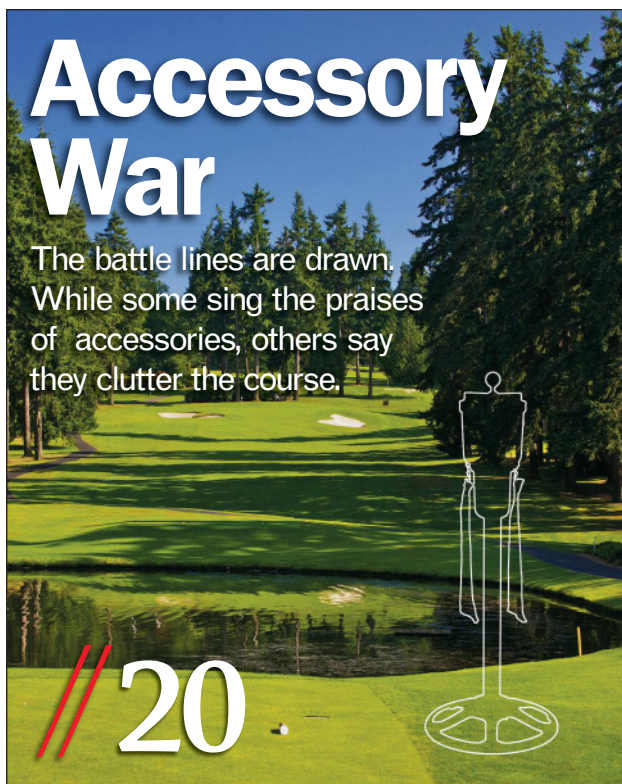
“ Third year of testing indicates up to 65% reduction in dollar spot.”

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

- 40-65% reduction in dollar spot
- 8 out of 9 rolling studies reduced dollar spot in 2017!
- Increased rolling frequency increased dollar spot control
- Threshold-based programs can reduce dollar spot apps with rolling (2-3 apps vs 5 apps)
- Rolling = better spring green-up/turf quality
- Does not provide complete control, but can extend fungicide-control intervals at golf courses with difficult-to-control dollar spot

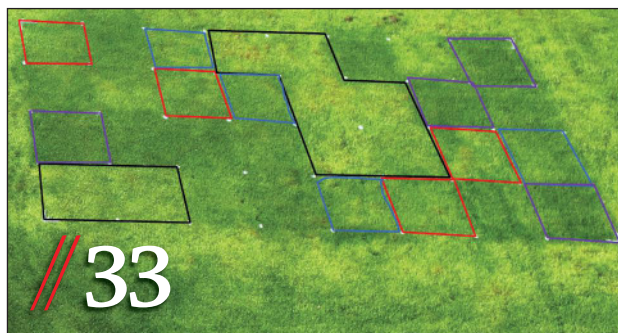


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CONDITION. PERFORM. RECOVER.

Fewer applications, fewer problems. How a Pittsburgh superintendent managed annual bluegrass weevil by using *fewer* resources.



The saying “less is more” rings true for Eric Materkowski, golf course superintendent at St. Clair Country Club in Pittsburgh, Pennsylvania. Fewer applications mean less time and money spent on working to improve the condition of the turf.

Freeing up the crew’s time with fewer applications not only improves overall efficiency, but eliminating the damage from annual bluegrass weevil (ABW) also helps St. Clair CC avoid the long process for turf to recover.

“When we didn’t have as good of control of ABW and we did have damage, it would impact the quality of the turf, and recovery could take a big part of the season in some cases,” Materkowski says. “Recovery of that type of damage can be difficult. It can take a long time, especially if it happens early in the year.”

St. Clair CC runs a three-product program for ABW that includes Syngenta’s Scimitar GC, Ference and

Acelepryn. “The combination of those products, when targeting ABW, seems to clean up just about anything we’re seeing,” Materkowski says.

Materkowski starts tackling ABW by treating the adults with Scimitar GC and follows it up with Ference. He says this process has given better control and more flexibility, and the duration of that control is a little longer. “We’ve found that Ference is a good addition to the tools we have,” he says.

The three-product program generally controls any pests that Materkowski deals with on the course’s surfaces. “We like to use Acelepryn as more of a grub control product when we do apply it, but it does give us a little benefit for our control of ABW,” Materkowski says.

Even with fewer applications, the club is seeing better results as well as improvements in the quality and performance of the turf. “We’re not seeing



Eric Materkowski

breakthrough or misses in our control, so the turf is benefiting and it’s healthier,” Materkowski says. “I think anytime we can control diseases and insects and improve the health and quality of the turf, the members are happy.”

Another tool St. Clair CC has been using to tackle ABW is Syngenta’s ABW management website, WeevilTrak.com, which Materkowski says has been very helpful.

Materkowski and his team receive local updates on WeevilTrak.com written by a team of researchers and consultants from around the country.

“Dr. Ben McGraw (Penn State University) does a nice job of giving us good information that’s relevant for our region. We find the timing of the treatment recommendations to be spot-on,” Materkowski says.

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“Part of the goal (of the First Green) is to interest kids in the industry,” Phipps says. “...the kids are going to remember that meeting for a long time.”

SETH JONES, *Editor-in-Chief & Associate Publisher*

Pro athlete, veterinarian or... superintendent

I had the pleasure of attending two graduations recently — one was a 5th grade graduation, the other a 6th grade graduation.

The comment everyone makes — especially grumbling parents in the auditorium — is, ‘Since when did we start having elementary school graduations?’ But I was proud to be at both, as one was for my daughter, Evey, and the other was for my niece, Marina.

(Quick dad-brag: Evey is a straight-A student, a voracious reader and most important, a kind kid. She’s my older child, and I can’t believe she’s already going to be a 6th grader. I’m overwhelmingly proud of her.)

While I was proud, I’ll still admit that Evey’s graduation was painful to sit through... it took too long, and the auditorium’s air conditioning couldn’t keep up with the crowd. Marina’s was better — shorter and with more personality. A fun addition to her graduation was that, as they

announced each student, the principal told the crowd what each kid hopes to be when he or she grows up.

The most popular answer was professional athlete — basketball led the field here in Jayhawk country. Then there were the kids who want to be teachers (it’s one of the few occupations they’re exposed to) and veterinarians (because some kids think vets pet cute animals all day.) One kid said farmer, another said comedian.

None of the students said professional golfer or golf course owner. And it will come as no surprise to you that there was not a single kid who said golf course superintendent, because odds are none of those kids know that is even a thing.

Why would they? It’s a largely unknown profession.

But perhaps the First

Green, a program that brings school kids to the golf course to learn about STEM (science, technology, engineering and math) has a chance to help with that. This month, the First Green, founded in Washington in 1997, officially becomes a program led by the GCSAA and the Environmental Institute for Golf, a pairing that goes together like peanut butter and jelly. The GCSAA field staff will lead the charge around the country as to the how and why of hosting a First Green field trip.

I talked to David Phipps, field staff representative for the Northwest Region, about the program. He hosted groups during his superintendent days.

“When you get a group, you tell them what you do, what your responsibilities are,” Phipps says. “Part of the goal is to interest kids in the in-

dustry — as everyone knows, we’re hurting for people. The kids are going to remember that meeting for a long time. They find out that this guy isn’t just a greenkeeper, he’s a scientist. It demonstrates the quality of people that superintendents are.”

Cory Brown, superintendent at Overlake G&CC in Medina, Wash., has been active with the First Green for years. He talked with a recent group about the difference between native and invasive species and why it’s important to remove the invasive plants.

“There are a lot of negative comments out there about golf’s effect on the environment... I can show them the programs we use and how we’re having a positive effect,” Brown says. “It’s a great outreach to the community.”

“Every field trip is a success story,” Phipps told me. “The look on the kids’ faces says it all. I’ve had guys tell me, ‘I’ll never (host a First Green group),’ and then they do it once... and now they do it all the time.”

I just asked my daughter what she wants to be when she grows up. And yeah, she said a veterinarian. I asked her if she would ever consider being a golf course superintendent. She asked, “What’s that?”

Guess I also need to do a better job spreading the word. She is a voracious reader, but no, that does not include *Golfdom*. ☺

Email Jones at: sjones@northcoastmedia.net.

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Starter

NEWS, NOTES AND QUOTES



// 10 LONG DAYS

From Texas to the Carolinas: Mark Semm (right) takes over for Gary Myers, CGCS, as project leader of BASF's Experience at Pinehurst.

IT ALL WORKS OUT FOR THE SEMMS

➔ Mark Semm, former superintendent at Cordillera Ranch in Boerne, Texas, recently took a leap of faith.

He and his wife decided to move back home to Charlotte, N.C. after Semm's father-in-law suffered a stroke. Semm and his wife resigned from their jobs and moved to North Carolina without jobs. "We couldn't help from 1,300 miles away," Semm says.

Semm describes what happened next as "surreal." After 10 days of being unsure what his future would hold, he accepted the position of project leader at BASF's Experience at Pinehurst.

"The whole reason we moved was to be closer to family. I could be sitting at home right now wondering what I'm going to do, but this is the icing on the cake," Semm says. "I always hoped that if I had to change jobs I would land on

my feet. But when you're going through it, you just don't know."

Semm takes over for Gary Myers, CGCS, who remains with BASF but took a position allowing him to move back home to Indiana. Myers will cover Indiana, Ohio and Northern Kentucky in his new role.

Semm will now be responsible for hosting some 500 superintendents a year at Pinehurst Resort, educating attendees on BASF's many products and on the research the company conducts at the golf resort.

"It's going to be fun to see other superintendents. I'm not jumping into a desk job with a flickering fluorescent light like in the movie 'Office Space,'" Semm says. "There's nothing like walking into Pinehurst and sitting on the white rocking chairs and talking turf."

// WATER AND SUSTAINABILITY

EWING, AUDUBON INTERNATIONAL CREATE NEW AWARD

Ewing Irrigation & Landscape Supply and Audubon International are now accepting nominations for the Water & Sustainability Innovation Award — a new opportunity for landscape companies, organizations and municipalities.

This new award will recognize a project that addresses sustainability challenges and water efficiency and contributes to a healthy environment, equity (quality of life) or a vital economy.

"We want to recognize and promote the positive impact landscapes and other green spaces have in creating more sustainable communities," said Christine Kane, CEO of Audubon International.

"As critical water challenges become increasingly prevalent, innovative projects that use sustainable practices serve as important examples for our country and the world," said Warren Gorowitz, Ewing vice president of sustainability.

To be eligible, projects must have been initiated within the past three years and must have been operational for at least one year.

Entries will be accepted online through Oct. 12, 2018 at <http://bit.ly/2018WSIA>. To view the award guidelines, visit <http://bit.ly/WSIAGuidelines>.

// MY OTHER BROTHER DARRYL

CMAA CHANGES NAME

The Club Managers Association of America (CMAA) recently announced it has changed its name to the Club Management Association of America.

The new name better reflects the composition of CMAA's membership. Today, approximately one third of the membership is comprised of professionals serving in management roles at club facilities but are not necessarily the top executive such as the general manager or chief operating officer.

Founded in 1927 (by *Golfdom* founder Herb Graffis), CMAA encourages the education and advancement of members through the Certified Club Manager (CCM) program and provides resources needed for efficient and successful club operations.

// IS THERE A DOCTOR IN THE HOUSE?

“Doctor of Green Speed” to keynote *Golfdom* Summit

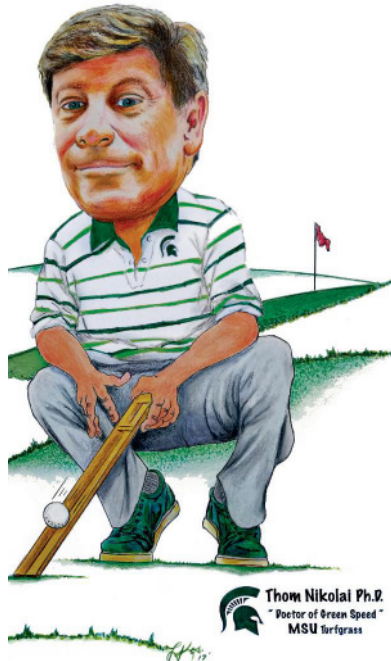
➔ Thomas A. Nikolai, Ph.D., Michigan State University, has given hundreds of presentations in his career, spanning four continents, 30 countries, seven Canadian provinces and 36 states.

This December he will add the honor of *Golfdom* Summit keynote speaker to his list of speaking accomplishments, joining the likes of Annika Sorenstam, Rees Jones and Rich Lerner.

Nikolai, associate director of the two-year golf turfgrass management program at Michigan State, is credited with discovering that lightweight rolling decreases dollar spot and other turfgrass pests. More recently, he has initiated mowing/rolling frequency research that maintains consistent green speeds, reduces turfgrass stress and leads to economic savings on golf courses. Nikolai also discovered that mulching deciduous leaves into turfgrass canopies results in fewer broad-leaf weeds, and he remains a leader in alternative spike research.

“We’ve had ‘Ms. 59’ and ‘The Open Doctor’.. now we’re thrilled to welcome ‘The Doctor of Green Speed.’”

The *Golfdom* Summit, now in its eighth year, takes place Dec. 3-5 at Reunion Resort in Orlando. The Summit brings together 50 superintendents from around the country with 20 industry suppliers and vendors for three days of meetings, demonstrations and networking.



Thomas Nikolai Ph.D.
“Doctor of Green Speed”
MSU Turfgrass

“It is an honor to have Dr. Nikolai, who is well known throughout the industry for his hard work helping superintendents have the best greens possible, speak at the 2018 *Golfdom* Summit,” says Seth Jones, editor-in-chief and associate publisher of *Golfdom*. “We’ve had ‘Ms. 59’ (Annika Sorenstam) and ‘The Open Doctor’ (Rees Jones) speak at the Summit, now we’re thrilled to welcome ‘The Doctor of Green Speed’ to address our esteemed group of superintendents and industry vendors.”

Nikolai’s keynote speech is sponsored by Nufarm. To learn more about the *Golfdom* Summit, visit golfdomsummit.com.

Golfdom Summit

THE NEW EVENT STANDARD

// WHAT’S ON TAP?

MICROBREW MEETS MACRO-GOLF

What once was a steam power plant in the Village of Pinehurst, N.C., is being converted into the Pinehurst Brewery.

The Pinehurst Brewery is set to open this fall. Much of the original steam plant building remains, but instead of turbines and generators, it will feature a 10-barrel microbrewery. An observation platform overlooking the brewhouse will be a focal point of the taproom, and the dining room will be complemented by a bar, a beer garden and an all-season patio.

“For almost a century, the steam plant provided power to the village. We hope this next incarnation of the building as the Pinehurst Brewing Co. provides a surge of energy for the entire community,” says Pinehurst President Tom Pashley.

The brewery is among the most significant of recent additions to the Resort, which includes its new short course, The Cradle, and a redesign of Pinehurst No. 4 by noted golf architect Gil Hanse.



An artist’s rendering (top) and current photo of the Pinehurst Brewery, where we’re sure we’ll find our editors soon.

ABOUT THE COVER

Are you for or against accessories on the course?

One thing we can all agree on is that photographer John R. Johnson snapped a great shot of the 380-yard par 4 Hole No. 10 at Inglewood Golf Club in Kenmore, Wash.



Golfdom Gallery



1 Finally got a birdie Chad Brakefield, U.S. sales director for Ferti Technologies, found a new way to get a natural birdie during a recent round at Fox Hopyard GC in East Haddam, Conn.



2 Photo op with the new CEO *Golfdom* Publisher Craig MacGregor (left) and Group Publisher Bill Roddy (right) stopped new Primera CEO Todd Ferguson at the recent Primera meeting in Dallas to take a photo for the magazine. Plenty impressive, as Ferguson has been on the move non-stop since he was named CEO of the company in April.



3 A couple familiar faces Look who we ran into in a hotel bar in Fort Worth! Two longtime turf jocks — David Mihailides, T&O sales specialist (left), and Joe Enciso, agronomic sales representative, both of Hocking International Laboratories. Dave and Joe said we should expect to be hearing much more from them here in a few seasons. Sounds like they've got something cooking!



4 Try to hide your excitement, Dr. D We promise, *Golfdom* Science Editor Karl Danneberger, Ph.D., was thrilled to present Ohio State University student Steven Marchionda with the Turfgrass Science Student of the Year Award. He just has a hard time showing it.



5 A super among the sports turf guys *Golfdom* Editor-in-Chief Seth Jones spotted a familiar face at the Sports Turf Managers Association show in Fort Worth — Jorge Croda, CGCS, Southern Oaks GC, Burleson, Texas.

PHOTOS BY: RYAN BATZ (1); SETH JONES (3,5)



“The U.S. Open and the Open Championship do have a commonality as we see the need to lengthen courses to make room for the ever-increasing distances professional golfers hit the ball.”

SEAN TULLY, *superintendent, Meadow Club, Fairfax, Calif.*

Golf's major problem

Another U.S. Open is in the books and Brooks Koepka repeats as champion! I think it is safe to say that we were all tired; the crew, the volunteers, the players, the media and even the audience at home. The U.S. Open has historically been one thing — the National Championship for the United States Golf Association. It has grown in stature and has become something altogether different in its attempt to identify the best golfer over the course of four days.

There is, of course, the Open Championship and its Champion Golfer which was the original in identifying the best golfer for the year — congratulations to this year's winner, Francesco Molinari. When comparing the two events, they couldn't be further from each other while still trying to identify the best golfers at their respective tournaments.

The U.S. Open and the Open Championship do have a commonality, as we see the need to lengthen courses to make room for the ever-increasing distances professional golfers hit the ball. We've seen this at the U.S. Open for the last 15 years or

so with some exceptions, but what really upset some people was the R&A adding 350 yards to the Old Course at St. Andrews since 2000. Where is the end game, and what impact has adding yardage had on golf in general?

For a long time, courses hosting championships have made improvements as a way to prove that their course is a stiff test of golf. One example from the earliest years is Chicago Golf Club — they hosted the U.S. Open in 1900 and again in 1911, where they added just over 600 yards to the golf course. This was done in large part to offset advancements in the golf ball, clubs and the improvement

of the competitors — sound similar to today?

In the early years, golf had some advancements that, as the game and golfers matured, made sense, and the game would settle in on courses that ranged from 6,800 to 7,000 yards in length. In 1937, Oakland Hills played host to the U.S. Open and was the first course to play over 7,000 yards in length off the scorecard. It would take over 60 years to see a course play over the 7,200 yard mark in 1997 at Congressional. In the 21 years since then, we have managed to get all the way to 7,740 yards, and just looking at the last five U.S. Opens,

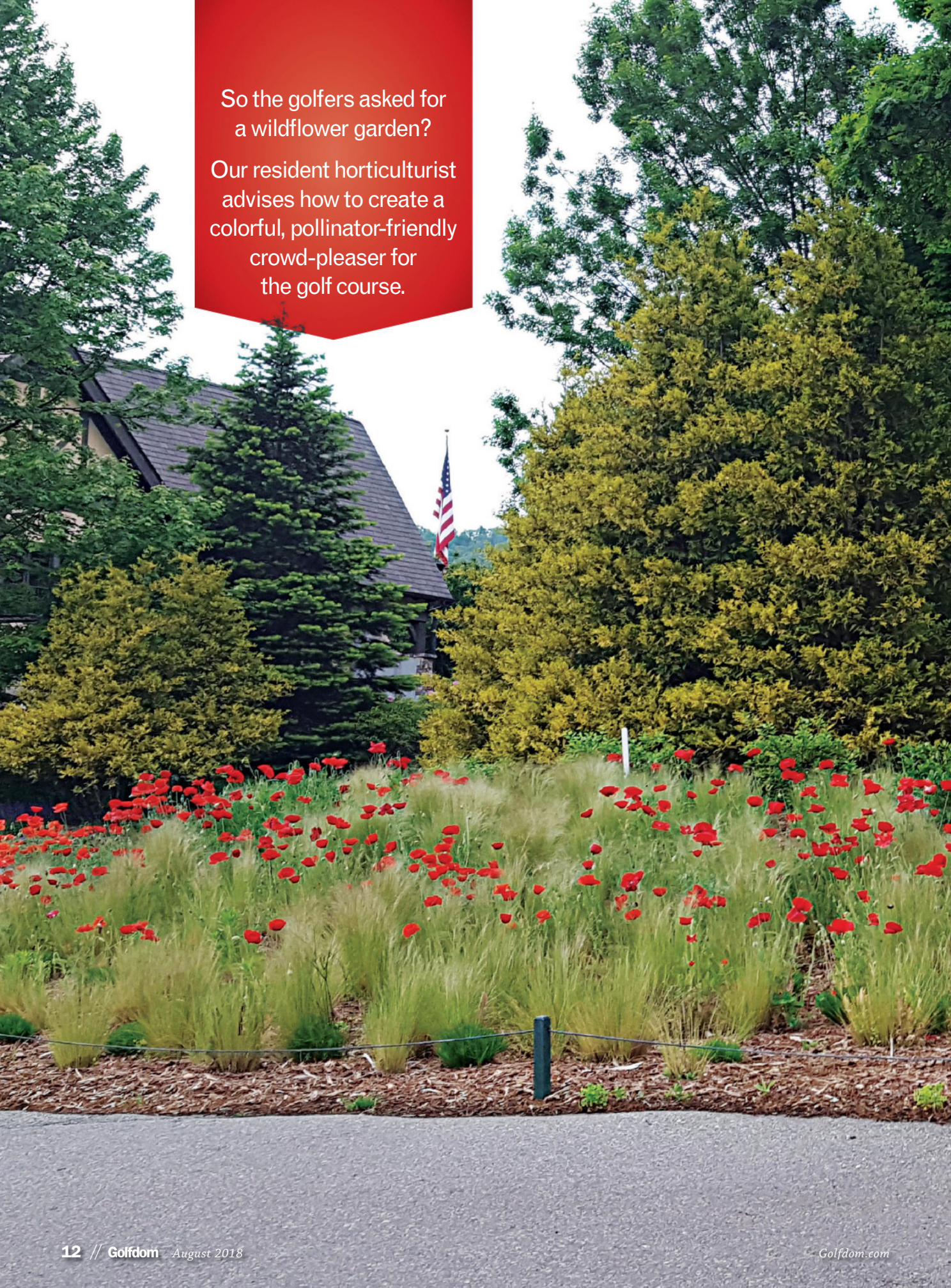
the courses have averaged just over 7,500 yards off the scorecard!

In the addition of yardage there has also been a narrowing of courses that play shorter, like Olympic, Pebble and Merion. Merion is an outlier as it also saw the course get lengthened by over 450 yards from the previous time it held the open — 1981 to 2013. So with this narrowing of fairways and lengthening of golf courses, it has had a huge effect on golf that has been building slowly over the years. When you combine that with all the golfers who took up the game after watching Tiger play, it has become a recipe for disaster.

We are at a crossroads in the game today in that it takes too long to play, but we are not addressing the problem. We don't need to come up with new ideas like larger cups or foot golf. Golf takes longer because we have either lengthened the golf courses or made it harder to play by narrowing them — both are efforts to protect par and make sure the golf course plays harder.

Instead of defending par off the tee, we should focus more on the approach shots into greens. Most courses would benefit from just adding width to the fairways and aprons, allowing for more options off the tee and approach shots into greens. **G**

Sean Tully is superintendent at the Meadow Club in Fairfax, Calif. He can be reached at stully@meadowclub.com or followed at [@tullfescue](https://twitter.com/tullfescue).

A vibrant garden of red poppies and tall grasses in front of a golf clubhouse. The garden is filled with numerous bright red poppies and tall, feathery grasses. In the background, there is a large evergreen tree, a yellow-green shrub, and a building with a dark roof. An American flag is visible on a pole in the distance. The scene is set outdoors with a clear sky.

So the golfers asked for
a wildflower garden?

Our resident horticulturist
advises how to create a
colorful, pollinator-friendly
crowd-pleaser for
the golf course.

Wildflower meadows

for the busy superintendent
(because, aren't they all?)

By Hannah Schrum

As seasoned veterans of the turf industry, superintendents rightly pride themselves on pulling off one of the most deceptively simple yet challenging feats of agriculture: cultivating acres of pristine turf. Then, just when you think you have a grasp on the ins and outs of monoculture, along comes the demand to add flowers to your course. And not just any flowers, but “wildflowers.”

Though members (or anyone advocating this for development) may be swayed by visions of an insta-garden sprouted from a can, featuring the image of a majestic alpine meadow, you may wish to prepare for a different reality.

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“Annuals... may require a bit of preparation and annual reseeding, but this method provides relatively quick and reliable results with a fraction of the oversight needed compared to a true meadow garden.”

With proper planning, a wildflower garden can be timed to bloom for a special event.



Continued from page 13

Blame the wildflower garden craze popular in the '90s. The fad — or rather, the marketing — of wildflower gardens carved a spot in the heart of the public for masses of colorful blooms. Unfortunately, growing these gardens proved more difficult than simply dispersing seed from a beautiful packet.

Luckily, the wildflower movement evolved. A respectable amount of R&D has gone into this agricultural niche, and specialists have developed better applications for creating the colorful gardens. Many seed companies stepped up their game with regionally specific seed mixes and concierge-type recommendations. The resurgence in demand for “carefree” blooms is now stronger than ever and even more convincing under the guise of pollinator habitats, native plant usage and general eco-friendly landscape solutions. If you are one of many supers facing demands to install a “wildflower stand” on or near your course, I offer a basic primer to get you started.

A garden, not a rose

A rose is a rose by any other name, but a wildflower garden is not. The concept of a wildflower garden often is more aptly named a *meadow garden*. It consists of perennial and annual flowers and native grasses installed using a combination of direct seeding and plug transplants. This mix of plant populations is extremely dynamic and takes years to establish, all the while demanding the guided expertise of a specialist familiar with each plant, its lifecycle and needs.

A meadow garden is the pinnacle of a beautiful, “natural” landscape. Ironically, it’s also a complex and demanding feature to install and coax into fruition.

Fortunately, there is a second version of the so-called wildflower garden, one that can be the answer to all your dicot woes. Let’s call it the *annual wildflower garden*, a simpler version. What an annual wildflower stand lacks in diversity and use of authentic region-specific native plants, it makes up for in color and quick, reliable results.

Why is it so important to understand the difference in terminology?

In golf terms, it’s a lot easier to put the ball



in the hole if you know where the hole is. By emphasizing the use of annual flower seeds, you maintain more control — and more assurance — that you will get a predictable stand of flowers, which most likely is the goal.

It's tempting to invest in longer-lived perennials. These too often are purported to be "low-maintenance" and guaranteed to return every year. Be wary of these promises. Perennials are slow to establish (most take a minimum of two years before bloom, and three to five years before they are hardy enough to not need coddling). And despite marketing, they may live only a few years beyond that.

Annuals, on the other hand, may require a bit of preparation and annual reseeding, but this method provides relatively quick and reliable results with a fraction of the oversight needed compared to a true meadow garden.

Fortunately for the busy superintendent, embracing the annual wildflower method provides a means of creating a colorful, pollinator-friendly and crowd-pleasing highlight on the golf course that you can achieve in a single season. If installing a wildflower area is on your list, consider these tips to make it happen:

PLAN AHEAD: This cannot be overstated. Allow

EASY-TO-GROW ANNUAL "WILDFLOWERS"

Regional results may vary.

*Cool-season annuals, planted in fall.

Cosmos

Zinnia

Corn poppy*

Corn flower*

Annual lupine*

Rudbeckia

Cleome

Sunflower

Poppies provide great color and also are friendly to pollinators.

for adequate timing and address a few key points prior to breaking ground, and half the battle is won.

SITE SELECTION: Make sure the designated area receives at least six hours of sun a day and is well drained. Bonus points if the area falls under irrigation, but it isn't always necessary. Knowing if the soil tends to be wet or dry will help determine seed selection. The site should be well away from areas that interfere with golf play. For best results, plan to use areas that

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3 WILDFLOWER GARDEN MYTHS

- **Low maintenance, “takes care of itself.”**
BUSTED — Nope, these actually take some mindful planning and know-how to pull off successfully.
- **Easily grown from seed.** *BUSTED* — Annual flowers can be grown from seed, but more complex designs that include native grasses and perennials should utilize plug transplants.
- **Will return effortlessly after the first year.**
BUSTED — You may luck out and get a gratuitous repeat on year two, but results in subsequent years decline rapidly if maintenance is abandoned.

Continued from page 15

allow for some distance between the casual viewer and the flowers. Wildflowers are best seen from a distance (a minimum of 10 yards if possible). This helps diffuse the natural untidiness of the plants, it masks weeds and it provides a comfortable distance between pollinators (bees) and golfers.

SEED SELECTION: Skip the garden-in-a-can generic mix. There now are numerous reputable seed companies (e.g. Applewood Seed

Co.; American Meadows) that can help select the varieties and amount of seed that best suit your region.

Make sure you specify that you want annual seeds (or perennials that will bloom the first year). Once you’ve got your list, order ASAP. Many flower seeds are available only seasonally, and stock often runs out.

PLANTING TIMING: If you want a colorful display to show off for an event in July, you will probably put out seed in April/May. If you need some pizzazz for an early spring opening, you’ll need to seed in the fall. Refer to specialists at the seed company to help you determine the ideal planting dates. Mark that date and work backward on the calendar to calculate when you must prep the seedbed.

WEED MANAGEMENT: This arguably is the most important part of the preparation process. Patience and thoroughness with this step is the absolute best defense against the weeds that threaten to ruin the project. To prepare the area, first remove prior vegetation/mulch. If needed, apply herbicide. Wait 10 to 14 days and till the seedbed under. Irrigate if possible to encourage the next flush of weed seeds in the soil to sprout before applying another round of herbicide.

Zinnias are easy-to-grow annuals and make a bright splash. Bonus, they also attract butterflies.



Wait another 14 days after the last herbicide application before putting out your seed mix.

SOWING: You may disperse seed mixed with sand using a broadcast spreader. Most, but not all, varieties also benefit from a light soil drag after dispersal. For best results, plant directly before a rain event, or plan to irrigate.

FERTILIZING: Don't. Or at least, wait. The types of annual flowers you are going to use are generally robust and eager to thrive, given enough sun and a reasonably weed-free seedbed. Applying compost or a granular fertilizer to the soil will only give the remaining weeds a leg up. Wait until the flowers begin blooming, then they will appreciate one or two seasonal applications of a foliar fertilizer.

Management

When your wildflower area is underway and growing, you might as well maximize the goodwill you're bound to earn with delighted members. Including educational signposts or informational updates in a bulletin to members helps maintain support for the change, especially as the areas grow through one or two awkward stages of development. Wildflowers are, after all, glorified weeds. Before they bloom, it may make your skin itch (and anyone else's who doesn't know what is to come) to see what looks like an unbearably weedy ground. You must resist the inclination to spray.

Anticipate that you'll need some spot weeding on the plot during mid-season when the flowers are in bloom and can be clearly differentiated from the inevitable weeds.

TIPS FROM HANNAH

- Don't skimp on seedbed preparation. Plan enough time to schedule one or two applications of herbicide to reduce weed population at the onset.
- Use annual seeds (also perennial seeds, which bloom the first year), as they will bloom in the current season and for the duration of the season (Note: cool-season annuals are not as long lasting as their warm weather counterparts).
- Use the expertise of a reputable seed company to help guide the process of your installment.



After the bloom season

When wildflowers have more dead material on them than blooms, it's time to mow. The timing of the end-of-season mow is not critical, though the longer you wait, the more likely gratuitous flower seeds will build up in the soil.

In preparation for next year's flowers, refer to the planning process. Here you may decide to skip herbicide applications if weed pressure was relatively low. In any case and for best results, plan to reseed with new stock every year. After three years, if weed maintenance has been adequate, you may find you can reduce seeding rates either by half or completely as the seed bank will have an adequate supply from the years' prior populations, if you skip the early-season blanket herbicide application. ©

Hannah Schrum is senior horticulturist at The Cliffs at Walnut Cove, Arden, N.C.

During early development, wildflower seedlings may look weedy. Anticipate this awkward stage and resist the urge to spray or pull.



“There are three certainties in life: death, taxes and one or two seasonal guys quitting without notice right when you need them the most.”

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

and “easy” seasons are like funny Woody Allen movies. They simply don’t exist, and anyone who says they do is lying in a vain attempt to impress people. Problem solving is what we do year in and year out. It’s in the bad years when all the experience and insight you’ve gained over the decades pays off.

One thing many of us struggle with, especially in the tough years, is finding ways to decompress and recharge. Almost every article you’ve ever read on this subject likely mentions this, but it bears repeating. Taking care of yourself physically and mentally always is important but is even more so when the pressure is at its worst.

Spend time with family and friends whenever you can. It’s amazing what even a couple-hour mental and physical vacation can do for your perspective and energy level. The necessity of being with the people who care about you the most can’t be understated. It never hurts to be reminded that there are people who love you regardless of how things are going at work.

And if watching Woody Allen movies is how you decompress, then by all means, disregard my earlier statement. If it works, I might try it myself. I guess it’s at least marginally better than crying at work. **G**

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

to cry about it. The thought may cross your mind to go to the bar and “drink about it,” which could be argued is a better option than crying at work, but neither is terribly productive.

I would even take it one step further and suggest that many people in this business thrive on this type of adversity and pressure. I’m not saying that anyone, if given the option, would choose to deal with the absolute dumpster fire that this time of year can bring. I am saying that, when it does happen, people in this business embrace the challenge and find another gear, even when it doesn’t seem to be there, and figure out a way to get it done.

Completely uneventful

but I’m pretty sure that’s the general idea.

I would be remiss if I didn’t also mention the virtually guaranteed catastrophic equipment failure, irrigation issue or massive storm that occurs at the absolute worst possible time. On the off chance that you don’t believe me, just check out Turf Twitter. It might cease to exist this time of year if it weren’t for people telling their horror stories to the only other people on Earth who understand what they’re dealing with.

But here’s the good news. You absolutely, without a doubt, got this. You didn’t get to this point in your career as a superintendent or assistant by just taking it on the chin and going into your office

This too shall pass

Ah, the dog days of summer. The weather is miserable, you and the crew are exhausted and the turf wants nothing more than to shut it down until next spring. And the good news is that you still have to get through your biggest event of the year.

When people in most other professions talk about the “grind,” they’re not having to do battle with Mother Nature on a daily basis. I don’t need to tell any of you that she is a heartless mistress who couldn’t care less that the greens need about a month of nighttime temps in the 50s and absolutely zero more days with heat indexes of 100 plus degrees.

In addition to dealing with her antics, you’re also dealing, at times, with her equally volatile offspring — human nature. You know the old saying, “There are three certainties in life: death, taxes and one or two seasonal guys quitting without notice right when you need them the most.” I might be paraphrasing a little,

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ACCESSORY WAR

BY SETH JONES

The battle lines are drawn. While some sing the praises of accessories, others say they clutter the course.

The USGA in April last year released a report titled, “Eliminating Golf Course Accessories Saves Time and Money.” But that report’s release wasn’t the first time Matt Pauli, director of marketing for Standard Golf, took note of this idea.

The first time was a year earlier, when he couldn’t find a place to throw away his trash at his dad’s country club in Michigan.

“I talked to some people in the clubhouse and I asked, ‘Where are all the trash receptacles?’ and they told me they were going for a cleaner, crisper look,” Pauli recalls. “They told me to keep the trash in my cart. I said, ‘But what if I’m walking?’”



Matt Pauli

It’s no surprise an employee of Standard Golf would take umbrage at the idea of getting rid of trash bins on a golf course — Pauli has skin in the game. But according to Pauli, the members at the course also revolted.

“Members started piling trash on the tee boxes as a passive-aggressive protest,” Pauli laughs. “Accessories are our bread and butter, so I was happy to see it.”

TEE DANCE

The USGA report (available online at tinyurl.com/usga-golf-course-accessories) noted that accessories were removed from the West Course at Westchester CC in Rye, N.Y. Ball washers, benches, trash bins, divot mix containers and tee caddies were removed during a tee renovation project. Tee markers were reduced from five sets to three.

By removing the ball washers, officials estimated the course saved 380 labor hours and \$3,000 in replacement parts and supplies for the year. Add in the removal of flowerbeds and the need for ropes, stakes, etc., Westchester CC estimates it will save 1,918 hours in labor and \$10,500 in supplies.

The USGA further supported the report with a video entitled, “Fore the Golfer: Are Golf Course Accessories Worth the

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THE USGA SAYS GOLFERS HAVE COME TO EXPECT COURSE ACCESSORIES WITHOUT REALIZING HOW EXPENSIVE AND UNNECESSARY THEY ARE.

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Hidden Costs?” Paul Jacobs, USGA Green Section Agronomist for the Northeast Region, narrates the video. “Golfers have come to expect course accessories without realizing how expensive and unnecessary they really are,” he says in the video.

Jacobs tells *Golfdom* that reaction to the report and video has been positive. He does not think reducing accessories will work for every course, but taking a critical look at how accessories fit into the overall



Paul Jacobs

plan is important, he says.

plan is important, he says.

“The USGA is all about conserving resources and being as efficient as possible,” Jacobs says.

“We asked ourselves, ‘Are these dollars being spent on accessories because courses need to, or is it a case of historically,

they’ve just always done it that way?’”

Jacobs says he thinks just about every golf course has reduced the number of accessories on the course in some way. And it’s not just about cost savings.

“When you remove these items from the golf course, people say the golf course feels grander, more open,” Jacobs says. “As a golfer, I agree.”

THE ‘CLEAN’ LOOK

Sean Reehoorn, superintendent at Aldarra Golf Club in Sammamish, Wash., is in the process of removing accessories at his course. He says he enjoys a “clean” look on every course he plays. One thing that drives him crazy, he says, is when there is a bench on a tee in front of him, disrupting his view.

There were no tee markers at Aldarra originally. Members would just tee it up from the same general area, playing a gentlemen’s game. Course managers then de-

cidated to get one set of tee markers for each tee. Now, to his chagrin, they have multiplied like gremlins — Aldarra has four



Sean Reehoorn

sets of tee markers on each hole.

It was the same story with ball washers. The course had a few at first, then one on every hole.

But the battle of ball washers is one Reehoorn is winning. All it’s taken is a little persuasion.

“We’ve been working on it over the last three, four years,” Reehoorn says. “I drop hint bombs to the members: ‘Hey, what if we (removed ball washers)?’ You have to get their support and explain what you’re trying to accomplish. You’ll always have some pushback. I joked to one guy, I’m going to give him one of the ball washers so he can put it in his locker.”

Aldarra is now down to one ball washer, and if it looks nervous, it should be — the last one is in Reehoorn's sights.

"Not every hole needs a ball washer... and why are they on tees? If they should be anywhere it would be near a green," he says. "Removing them saves labor, and that's a factor for us. It's hard to say I'm saving money but I am saving labor in the time it took to edge around them, paint them and make them look good."

IN DEFENSE OF AN ICON

Dan Brown, sales and marketing manager for Par Aide Products Co., says it wasn't the USGA's report that first put accessories in the crosshairs. It was the Great Recession.

"Everyone was looking at their budgets and where they could possibly make cuts," he says. "Labor, chemicals, overseeding, accessories... everything was on the list."

Par Aide was prepared and had historical data to show golf course managers that it wasn't accessories that were putting courses behind the 8-ball.

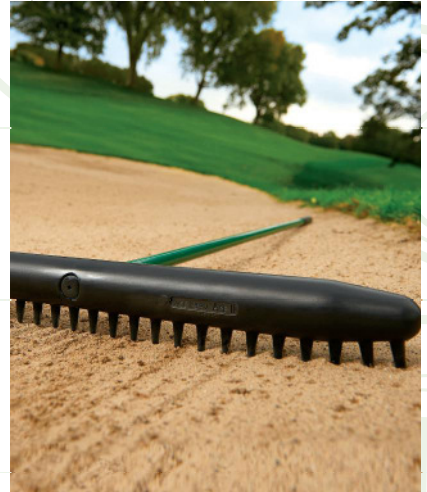
"For literally decades we have been tracking the amount an average course spends annually on accessories. It comes out to be 1 percent of their total maintenance budget, when you exclude labor and water," Brown says. "This is an incredibly small



Dan Brown

dollar amount that is being spent on products that have a direct impact on a course's image, pace of play, etc."

Brown says Par Aide is always looking for new innovations, even for a product like their ball washer, which he calls "iconic." But he doesn't see the ball washer



Brown suggests that simply adding one extra bunker rake in larger bunkers can speed up pace of play.

or any of their products as the bad guys on a golf course; they're the good guys.

"Pace of play is a huge issue in golf right

Continued on page 24

PHOTOS COURTESY: PAR AIDE

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Continued from page 23

now, and accessories can play a critical role in speeding up rounds. For example, having the right number of bunker rakes in a bunker means a golfer won't have to walk around a bunker, find a rake and then walk back to rake it, or worse, do it with their feet," Brown says. "Private courses might be different, but at public courses, if there is the proper signage to make sure golfers know where they're going, it will help cut down on unnecessary back-ups."

Removing ball washers, Brown says, may cater to core golfers, but not to the average golfer.

"The average golfer doesn't carry a towel to the green, they're simply cleaning golf balls with their hands or not doing anything at all," Brown says. "The tee is the only place on a hole, other than the cup, where all the golfers assemble at the same time, so it's natural that it's placed on the tee. The accessories also act as a waypoint for the tee, letting golfers who may not be familiar with the course know where the next tee is located."

Brown says Par Aide respects the idea of keeping the golf course looking clean, but he's not buying the idea that accessories are high maintenance.

"We've done the survey work, we asked superintendents how much time the crew

Ken Newcomb, former superintendent, now vice president of Par West Turf Services, says golf courses can have their accessories and labor savings, too.

spends wiping down ball washers, refilling them, emptying the trash and general attending of 'tee accessories,'" Brown says. "It averaged out to 91 minutes a month. People aren't taking them off the course because they require a crazy amount of maintenance. If they are, it's generally more for aesthetic reasons."

BOTH SIDES NOW

The best perspective on the accessory debate might come from someone who has worked on both sides of the tee markers — as a superintendent buying and maintaining accessories and as a businessperson selling them.



Ken Newcomb

spent 15 years as a superintendent and who three years ago became the vice president of Par West Turf Services.

Par West Turf Services, based in Huntington Beach, Calif., is one of the largest distributors of golf course and landscape

products in the country, selling both Par Aide and Standard Golf products.

"(Removing accessories) has been on my radar since I started as a superintendent," Newcomb says. "When you worked at a private club, the idea was not to put much out because it's the members' club and they knew where everything was. When we first started putting accessories out, there was a backlash that we were making the course look 'public.' Then the members started liking the accessories and it went from one extreme to the other."

Newcomb believes courses are finding the proper balance when it comes to accessories. Putting a lot of accessories on a course can take away from the course's natural beauty, he says. But he also believes that a nice tee set up with a ball washer, a sign and a flower bed can be a great complement at many courses.

As for the potential cost savings?

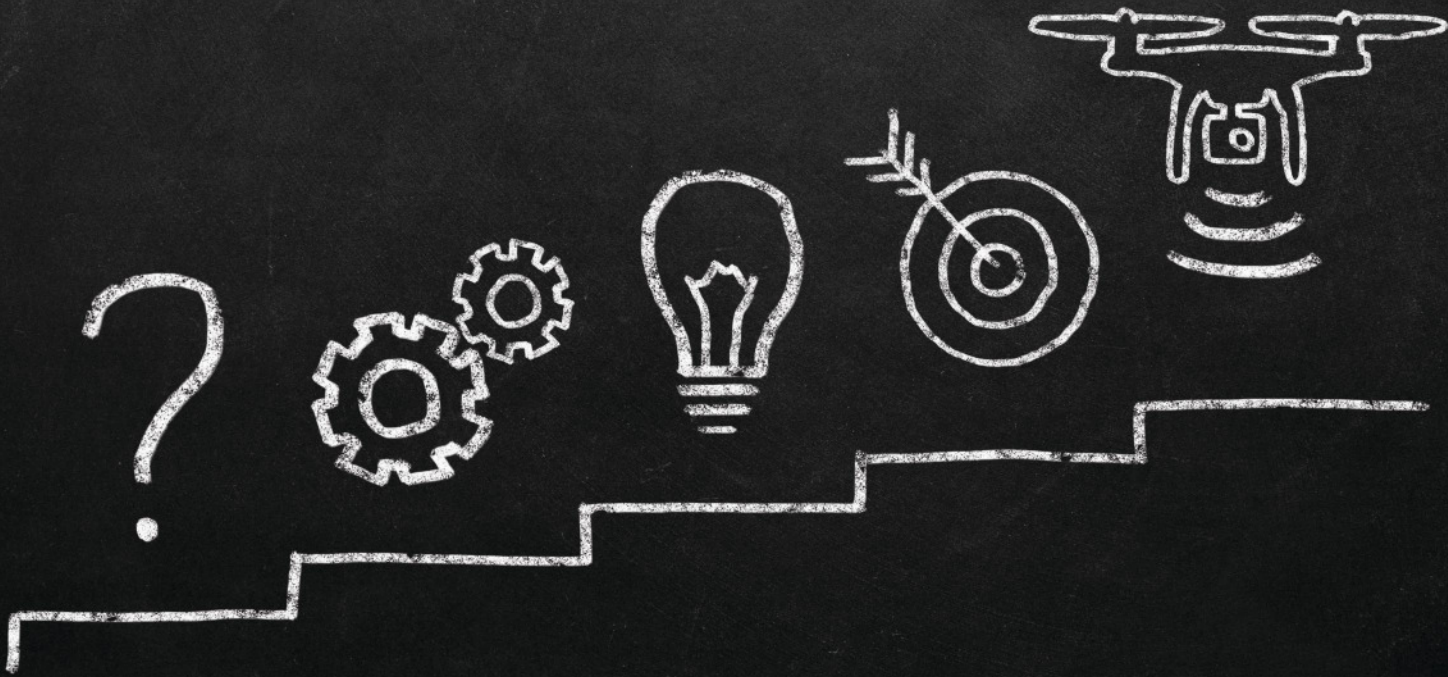
"The accessory budget is such an insignificant line item in the overall budget," he says. "The cost savings is in the labor savings."

Speaking like a superintendent, he advises courses to work smarter, not harder. Courses can have accessories and labor savings, he says.

"Five sets of tees, a ball washer, a tee caddie — that all has to be moved and put back," he says. "When I worked for Club-Corp, they advised us to move all that off the grass and keep it in concrete so it doesn't slow the crew down. Because once the crew gets caught by play they move at a snail's pace."

Happily for Newcomb, he has not seen a downward trend in accessories sales. He also saw something during a recent round in Orange County, Calif., that makes him think courses might be finding new ways to accessorize.

"I played a course with \$200 greens fees, and they had cornhole boards behind the first tee," Newcomb says. "They had music playing over the speakers by the snack bar. We grabbed a drink and played cornhole while we waited to tee off. It was a cool use of amenities to make the day more fun." ©



Roadmap for a startup

BY PHILIP HALL

When you think about a tech startup, you might envision a residential house stocked with young, tech-savvy hipsters all hunched over laptops, with an accouterment of off-hours amusements dotting the periphery. Once some venture capital firm swoops in, infusing said startup with cash, the whole tableau moves to a sprawling former warehouse space elegantly retrofitted for the new economy.

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Insights into
marketing
new tech in
golf course
maintenance.



“The cameras, the sensing package, the data analytics — it all offers actionable information.”

Continued from page 25

But what does a golf tech startup look like? The golf industry offers precious few examples. But GreenSight Agronomics may offer our best insights to date.

Based in Boston’s Seaport District, the 3-year-old drone services and data-analysis company is, in part, just what you’d expect. Its offices at 12 Channel Street do feature a gaggle of young coders and engineers, all milling about an oversized, honest-to-goodness former warehouse space.

Led by CEO James Peverill and in the middle of its third golf season, GreenSight has steadily been adding client courses to its subscription service, whereby daily drone flights (deploying thermal-mapping cameras) deliver actionable data that enables superintendents to reduce water consumption, better task labor associated with moisture measurement and be more efficient with fungicides, pesticides and fertilizer applications. The firm’s proprietary software also interprets drone-gathered data relating

to soil temperature and soil compression.

GreenSight drones (www.GreenSightAg.com) fly autonomously. Data is uploaded and processed automatically using the firm’s dedicated cloud service. Client superintendents can access that data almost immediately, thereby monitoring changing turf conditions and stress levels daily. All-in drone service packages from GreenSight start at \$500 per month, with lease commitments ranging from three months to 12 months.

This past winter, The Toro Co. — acting in a venture capital role — announced a strategic minority equity investment in GreenSight (terms were not disclosed). Also last winter, GreenSight secured earlier funding rounds from Kiddar Capital, Science Vest and Emerald Managers, all of which marks a sort of coming of age in the life of a tech startup. Toro’s VC investment — aside from adding an influx of working, growth-enabling capital — brings with it a sort of validation from one of the best-known brands in golf.



Few U.S. companies have been granted a waiver by the Federal Aviation Administration to operate a drone without a pilot present. GreenSight's pilots are in Boston.

"We call it corporate venture capital, and we've found these opportunities serve to accelerate innovation and better inform the products we market for customers," explains Nick Rhoads, Toro's director of business development and strategic planning, who adds that the company has made several such investments in the last 10 years.

"We were attracted to GreenSight for its leadership in turf sensing. With things like Turf Guard (Toro's wireless soil-monitoring system) and PrecisionSense (a patented system that collects data on soil moisture, volumetric water content and salinity), we've been very involved in this aspect of the turf market for quite a while — but these are in-ground tools. What drew us to Green-

Continued on page 28



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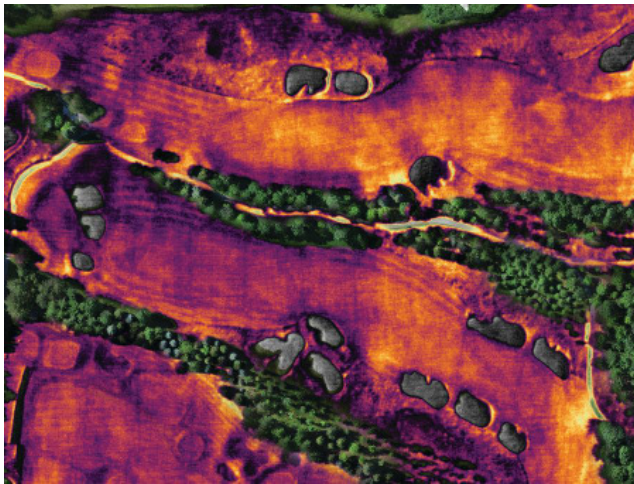
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Because perfection is so vital on a golf course, the GreenSight technology made a good fit for golf over other ag markets.

Continued from page 27

Sight was the ability to do this sort of data collection remotely.

“The goal for a golf course superintendent is to achieve a more efficient use of resources, be it human resources or fertilizers, pesticides, etc. GreenSight offers a tool to superintendents that

complements the turf-sensing capability we already had. The background of the founders of GreenSight was also attractive. It brought validity to the technology. The cameras, the sensing package, the data analytics — it all offers actionable information to the superintendent. We were drawn to that because that’s what we are and what we do.”

In many ways, GreenSight’s growth and Toro’s investment in it are straightforward. This is how 21st Century capitalism is supposed to work.

In other ways, however, GreenSight is an anomaly — that rare tech startup in the golfing realm. But why are golf tech startups so rare?

Emerging technology, common misconceptions

Prior to forming GreenSight in 2015, Peverill worked for nine years at Aurora Flight Sciences, which contracted with the U.S. Department of Defense to develop and deploy drone-reconnaissance technologies in military locations like Afghanistan. In a sense, technology training doesn’t get any more “real world” than that, but Peverill long had his eye on consumer applications for this emerging technology.

“I wanted to build something that really changed the face of

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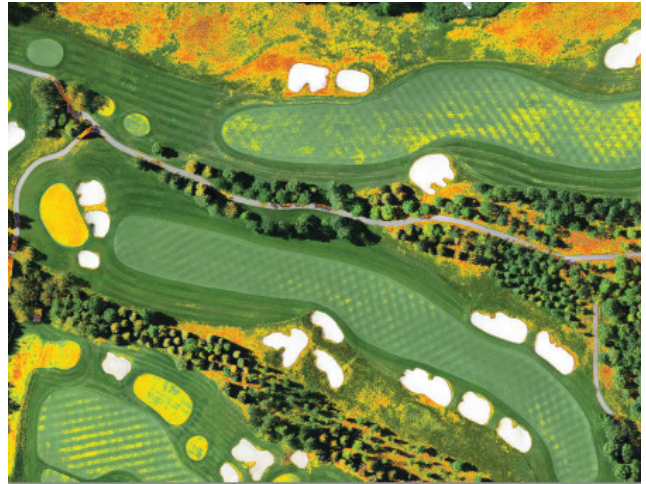
an industry,” he says. “I had a strong belief that unattended operation of aerial cameras and monitoring vehicles could do that, and that drew me. I had played around with starting a company before GreenSight. We never raised any money but I learned a lot about the space, about the VC process. It obliged me to do a lot of research about drone technology in the context of commercial markets.



James Peverill

“In the military context, you’re talking low-volume, high-priced, very specialized applications. I was pretty convinced, as others were, that there were opportunities outside the military where this sort of capability would generally be more useful to society, to a market. I also felt that outside this highly regulated atmosphere, the technology could be way less expensive, which makes a lot more people interested in it from a commercial standpoint.”

There’s a common misconception about drones. Most unmanned aerial vehicles (UAVs), while technically “unmanned,” are in fact deployed and operated by a pilot on the ground who must remain within visual sight of the aircraft. “What our tech-



GreenSight’s Jason VanBuskirk believes the technology will resonate with supers looking to be more efficient.

nology allows,” says Peverill, “is the removal of that person on the ground. We fly that vehicle and gather aerial data without anyone present.”

This sounds routine to drone operation, but it’s not. The key

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acronym here is BVLOS, or “beyond the visual line of sight.” Only a dozen U.S. companies have been granted a waiver by the Federal Aviation Administration to use technology enabling the operation of UAVs in this manner. GreenSight was formally granted that clearance in December 2017.

“When you get to a point where it’s unattended, and the system can operate on its own, then customers don’t spend much time on the flying. That makes it far less expensive and time consuming for clients,” Peverill says. “It really unlocks new business models and makes the company supplying the drone service that much more viable.”

In the early 2010s, Peverill was unsure as to what specific markets could best be affected by this technology and its potential. Agriculture was attractive because each crop really is its own market, he explains.

“We looked at all sorts of different crops, trying to game out what might be the best fit,” Peverill says. “That’s how we came to turf, which is one of the single biggest and best ag markets when you look at it through this lens.”

There are all manner of turf managers out there, of course. When Peverill drilled deeper and came upon golf course super-

intendents, the proverbial light bulb went on.

“Specifically in golf, there’s a focus on perfection that is different from other ag markets,” says Peverill. “Any faults in turf quality or performance are immediately recognized and people — golfers, members, board members — are watching very closely for those faults. In other markets, there is more margin for error and more focus on yield.”

In December, GreenSight was selected by Airbus (OTCPK:EADSY), a global leader in aeronautics, space and related services, to provide hardware, firmware and software tools for the Airbus Reliable Aircraft Connectivity Demonstrator, a flexible new radio architecture designed to improve passengers’ onboard experience and support efforts to implement more autonomous commercial aircraft. The technology also will support future capabilities in formation-flight, urban air mobility and the digitization of maintenance and flight-operations support services.

“The aviation community is very risk averse, too. Because, you know, you can’t have any slip-ups when you’re flying people around,” Peverill says. “I think there’s an analog there — with turf management in the golf sphere. It’s not life and death, but superintendents don’t have that margin for error, either.

“Superintendents are very interesting case studies. They deal

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with time constraints. They are sensitive to adding anything to the mix that might reduce efficiencies. They do the accounting, all the labor allocation, the hiring and firing, the budget planning. It's like a mini company within the golf course organization — but it's not their company! So they are very crunched for time, obsessed with perfection when it comes to course presentation, and a bit risk averse.

“Basically, this was a very promising group of potential customers for us... Yes, there's a barrier to entry, but if it helps them deliver perfection with more accuracy? They immediately see the value.”

Art meets science

The rest, as they say, is history. The hard work of coding and programming the flight capabilities of a golf-specific drone — to rise (unattended) from its small “garage” each morning, to fly an entire course footprint before returning to that garage — was relatively straightforward for Peverill and his team. It took longer (and several pilot programs) to determine just the right kind of cameras to transmit all the image data to company headquarters, then relay it back to client superintendents for analysis.

“If it helps (supers) deliver perfection with more accuracy? They immediately see the value.”

That said, GreenSight is now flying drones at golf properties nationwide, utilizing its third-generation system.

The success of a tech startup like GreenSight does beg the larger question: Why aren't there more like them? Here again, the psychology and work profile of the golf course superintendent are central to working theories.

“I think this is an industry where supers are very by the book, very old-school,” says Jason VanBuskirk, GreenSight's vice president of sales and marketing and a former superintendent. “Whether they're 24 or 74, most of the time, supers are going to do what they did before, or what their buddies have done successfully down the road. We're very habitual creatures.

“Yes, younger guys are more tech savvy generally. They've grown up with cell phones and aren't intimidated by a cloud-based system. But I'd say that a big chunk of the superintendent population is 10 to 15 years behind the curve on the technology side, which has got to have an effect on the opportunities that entrepreneurs see when they're considering golf as a market. Adaptation to tech — tech that will better them as superintendents — is a really difficult pitch. It's almost like we're coming in and telling them they're not as good as they could be.”

And does this end-user attitude tend to discourage the development of tech in golf, from startups or more established firms?

“I think this tech is largely available now,” VanBuskirk says. “If you focus hard enough, if you want to find something, it's available. Monitoring your pump from a cell phone? Already available. Mapping your irrigation system from your phone? Already available. I think companies have done a pretty good job, to be honest, staying ahead of the curve. But supers are so nitty gritty and habitual. They should trust data more, but instead they want

Continued on page 32

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to go out to the 6th green, take a core, feel it and taste it.”

VanBuskirk isn't just a former superintendent. In 2016 (alongside another former super, Stephen Ohlson), he launched his own tech start-up, Turf Cloud, a digital transformation tool aimed squarely at golf course supers. GreenSight acquired Turf Cloud late in 2017, and Ohlson came aboard as GreenSight's vice president of products. Turf Cloud's proprietary dashboard (Turf Dash) has three core programs:

- CourseTrakk, a digital job board embedded right on the Turf Dash that helps supers manage and monitor ongoing labor allocations;

- EquipTrakk, a digital log book that allows superintendents and equipment managers to keep tabs on equipment coming into the shop for routine maintenance or emergency repairs; and

- AgTrakk, which allows supers, their assistants or any staff member to input and monitor all agricultural practices performed each day, each week, each month.

Turf Dash enables superintendents to store all this data — the actionable data every superintendent craves — in a single place, organize it, and make it accessible for analysis and deployment. As you might expect today, Turf Dash neatly integrates GreenSight's drone-enabled data, as well. Which is to say, VanBuskirk comes at the questions of why superintendents are seen as resistant to tech (and why there may be fewer golf tech start-ups) from a pretty informed perspective.

“Look, there's an art to growing grass. I don't want that to ever die,” VanBuskirk says. “But supers don't buy like typical tech customers buy, either. They make decisions based on feeling, touching and using the product. If they can't, you're not going to sell them. If you can't throw down a drone for a demo and offer them total access for 30 days, you're not going anywhere.

“It's still a pure word-of-mouth industry. Not sure that will ever change. Normal tech customers see a cool commercial, read a review. They make the investment because they want the latest and greatest. Supers aren't like that. Of course, tech consumers are generally after the latest for themselves, whereas supers are buying on behalf of the club. In the tech world, some company builds a site, adds a buy-now button, a PayPal option, and expects the sales to start flowing. That is never going to happen in golf.”

Toro first came across GreenSight at the Golf Industry Show in early 2017. Previously, Toro had done extensive work in turf sensing through its Center for Advanced Turf Technology, which aims to identify emerging trends and, through the application of appropriate technologies, help discover new solutions to increase productivity, conserve resources and improve growing conditions. Part of its mission is to keep an eye out for companies like GreenSight that are innovating in

ways that bring value to customers.

“It's a sort of ‘where the puck is going versus where it is today’ thing. There are large, entrenched market leaders on the product side who are innovating in effective ways. Toro is one of them,” Nick Rhoads says. “But it's companies like GreenSight that are really innovating to help superintendents be more efficient. Acceptance has been slower. Why? Well, a lot of superintendents who've grown up in this industry, old and young, are very product driven with a lot of brand loyalty, which isn't going away. Given where we are on the product side, to take it to the next level we have to think outside the box — something that isn't your typical product.

“For superintendents, I think it's about being more efficient, more productive with the resources you have. In today's connected world, you do what you have to do — or you'll be behind. With more millennials and younger people in the field, I think they'll be more accepting of innovations like this.”

Peverill argues that, for GreenSight, the involvement of Toro effectively leverages a superintendent's innate brand loyalty. “Supers already believe in Toro,” he says. “Yes, they're playing a VC role here, but they have far more credibility in this marketplace than any traditional VC would have. If we're going to try and disrupt a super's traditional behaviors, which are very habitual — and if that habit is working with Toro — OK then. Let's work with Toro.”

“Brand loyalty is not diminishing in golf, and word of mouth remains extremely strong in the golf course superintendent community,” Rhoads adds. “Yet I think a good product with some of their own behind it will work. GreenSight and Turf Cloud getting together is a testament to that hypothesis. We believe they'll be successful, and we're excited to be involved.”

Maine-based writer Philip Hall is a frequent contributor to *Golfdom*. He most recently wrote about the construction of Trinity Forest in Dallas for the 2018 AT&T Byron Nelson.

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NEWS UPDATES

USGA OFFERS ADVICE IN THE BATTLE AGAINST THATCH

According to an article by Todd Lowe, USGA Green Section agronomist for the Southeast Region, superintendents are combating thatch with a variety of cultivation programs, including deep verticutting, scalping and fraze mowing.

Thatch can create soft, inconsistent playing conditions and may negatively impact turf health. With a nearly year-round growing season in southern areas and the nitrogen applied to maintain healthy playing conditions accelerating thatch development, aggressive dethatching is necessary for many southern golf courses every summer, Lowe says. Dethatching must take place during summer when warm-season grasses can recover quickly.

Lowe cites the experience of Billy Davidson, superintendent of the Country Club of Naples, who refers to the summertime battle with thatch as the "100-day war." Davidson's course closes for two periods during summer to undergo multiple rounds of coring, verticutting and scalping, which allows the golf course to recapture top-quality playing conditions.

Topdressing playing surfaces with sand will help achieve additional thatch dilution, improving consistency and uniformity, Lowe says. He explains that the more thatch and organic matter that is removed during summer, the better conditioned a golf course will be throughout the year.

“WHAT HAPPENS EARLY IN THE WINTER REGARDING SNOW MOLD DEVELOPMENT IS MORE IMPORTANT THAN LATER IN THE WINTER...”

Paul Koch, Ph.D.

(see story on page 34)

// CHELATES VS. IRON SULFATE

TREATMENT OF IRON DEFICIENCY AND CHLOROSIS

By Bill Kreuser, Ph.D.

Iron (Fe) chlorosis of Kentucky bluegrass and creeping bentgrass can be a perennial summer problem. Symptoms usually include light yellow or lime-green leaves in July and August. Scientists believe that iron chlorosis is a root dysfunction that occurs when soils are hot and/or wet. Grasses make natural chelating molecules, phytosiderophores, which help extract micronutrients like iron and zinc from high pH soils. It's likely that this nutrient mining system slows or stops when the soils are hot and wet.

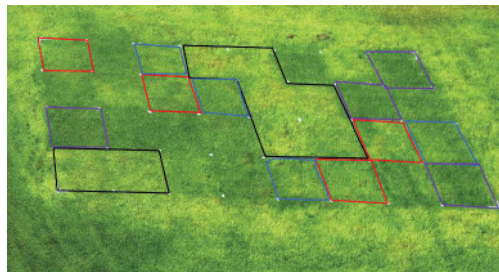
Iron chelates were tested on a Kentucky bluegrass stand at Heritage Hills Golf Course in McCook, Neb. We applied iron fertilizer as iron sulfate or with common chelates like EDTA, DTPA, citric acid and a less common turf chelate, EDDHA. Treatments were watered in after the first application to limit foliar uptake.

After several weeks, there was no improvement with all the tested iron treatments. One month after the first treatments, we reapplied iron treatments but did not water them in. The differences were remarkable. We concluded:

- 1) Only foliar iron fertilizer applications reduced deficiency symptoms. Don't water in Fe.
- 2) Deficiency symptoms improved with increased iron fertilizer rate (1.6 oz. Fe/1,000 sq. ft. maximum application rate tested).
- 3) The chelated products did not outperform the cheaper iron sulfate (aka ferrous sulfate).

If iron deficiency is a perennial problem for Kentucky bluegrass, avoid excessive irrigation, make foliar applications of iron fertilizer and don't water it in.

Bill Kreuser, Ph.D., is a turfgrass scientist at the University of Nebraska-Lincoln. You may reach Bill at wkreuser2@unl.edu for more information.



Turf response to foliar iron fertilizer applications. Plots outlined in black received zero iron fertilizer. Red plots and purple plots received 0.4 and 1.6 oz. iron per 1,000 sq. ft., respectively, from iron sulfate (Extreme Green 20, 20 percent iron by weight). The blue boxes were treated with 0.4 oz. of iron per 1,000 sq. ft. plus citrate and EDTA chelates at 2 oz. per 1,000 sq. ft. product from Iron Chelate 20.

//THINGS ARE CHANGING

The thin white line

Just a few miles make a big difference in snow mold control.

By Paul Koch, Ph.D.

Snow mold is one of the primary diseases of golf course turf in Wisconsin, as it is in much of the northern United States. Depending on your location, snow mold can be a disease that costs tens of thousands of dollars to control, with the potential to shut a course down for weeks in the spring without proper fungicide protection.

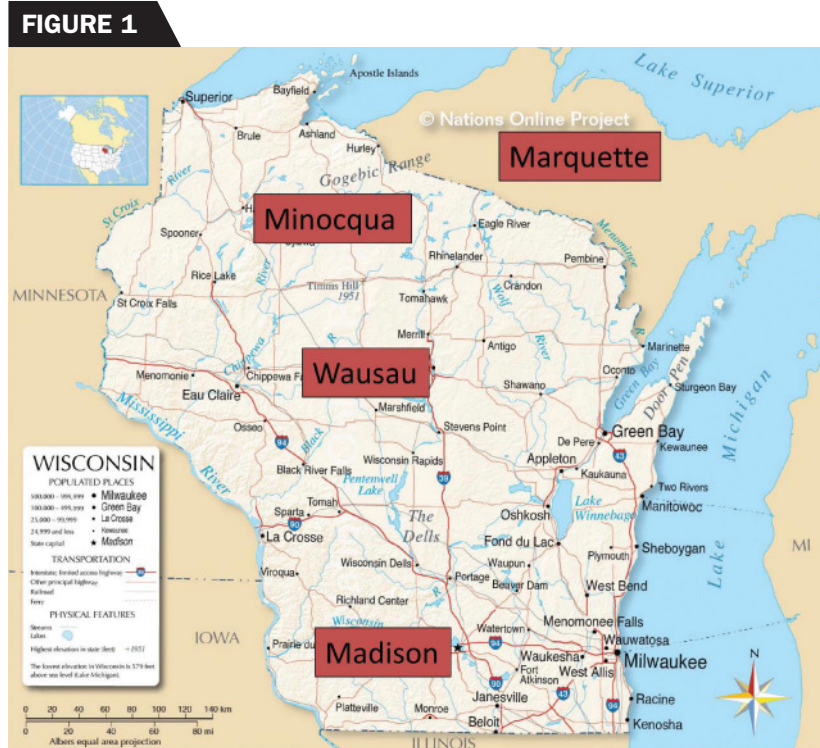
Or, it might be a disease you spray for because you don't want that winter to be the one your course receives record snowfall, even though in most years you don't see much snow mold.

The line between severe snow mold and no snow mold seems to be getting thinner, and the winter of 2017-2018 showed just how sharp the cutoff can be from intense snow mold pressure to almost nonexistent pressure. Knowledge of this cutoff and the impact it has on your risk for snow mold development has important implications for all turfgrass managers in temperate climates.

WISCONSIN 2017-2018 RESULTS

At Wisconsin, our snow mold investigations include product testing research and applied research investigating application strategies and snow mold fungicide persistence. We typically test at sites across Wisconsin and the upper peninsula of Michigan to provide a broad swath of snow mold pressures, from relatively low pressure in southern Wisconsin to moderate in central Wisconsin and high in northern Wisconsin and the U.P.

In 2017-2018, we conducted snow



Map showing the four University of Wisconsin snow mold research sites in 2017-2018.

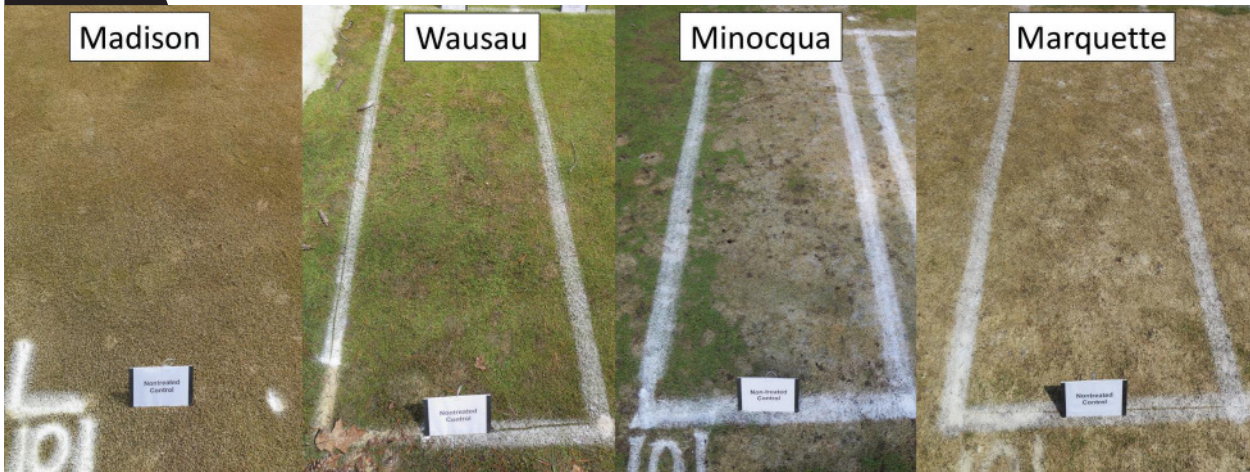
mold research at Cherokee CC in Madison, Wis.; Wausau CC in Wausau, Wis.; Timber Ridge GC in Minocqua, Wis.; and Marquette CC in Marquette, Mich. (Figure 1). Madison, Wausau and Marquette were product-testing sites, while Minocqua hosted a GCSAA-funded study on optimal snow mold fungicide timing.

In a typical winter, pressure in the non-treated controls would be approximately 25 percent in Madison, 75 percent in Wausau and 90 percent in Minocqua/Marquette. However, recent winters have produced sharper cutoffs, and 2017-2018 was an extreme case: Madison had 0 percent disease

in the non-treated areas, Wausau had 11 percent disease, Minocqua had 88 percent disease and Marquette had 99 percent disease (Figure 2). There are just 68 miles between Wausau and Minocqua, an easy one-hour drive up Highway 51... but it made all the difference last winter between intense snow mold and barely any snow mold.

Weather is the major driver in snow mold development, but how did such an intense disease difference develop over such a narrow area? Both Wausau and Minocqua had snow cover from approximately mid-December through mid- to late April, and both sites had similar air temperatures throughout

FIGURE 2



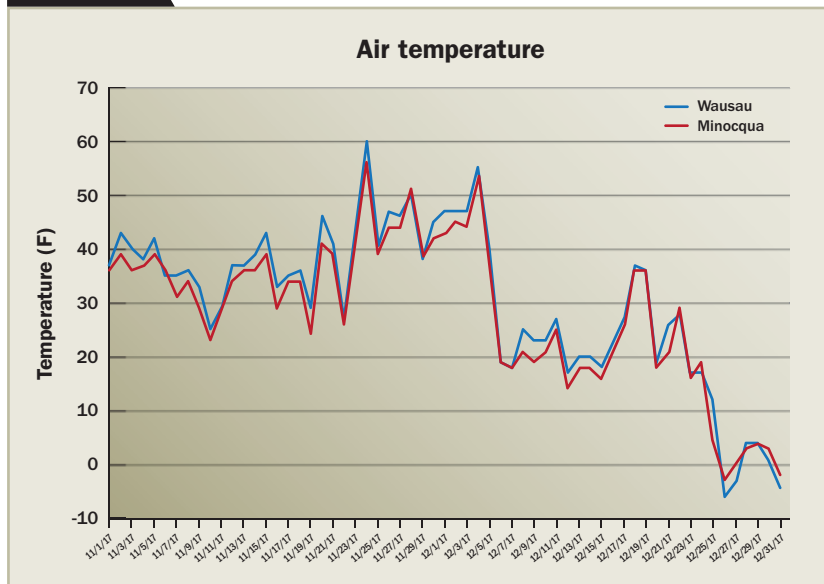
Snow mold present following snow melt in 2018 in the non-treated control plots at Cherokee CC in Madison, Wis.; Wausau CC in Wausau, Wis.; Timber Ridge GC in Minocqua, Wis.; and Marquette CC in Marquette, Mich.

November and December, when snow mold fungal growth is in its early (and crucial) phase (Figure 3). However, Minocqua had 8 to 12 inches of snow on the ground during a deep freeze in late December, while Wausau only had 2 to 4 inches, according to the National Oceanic and Atmospheric Administration Snow Depth Report from Dec. 20, 2017. The deeper snow depth at Minocqua insulated the turf (and the snow mold fungi) below during the cold snap and allowed it to continue growing early in the season. Wausau's snow depth didn't provide the same level of insulation and the upper soil froze, inhibiting fungal growth in the same manner as a fungicide application. Though lots more snow fell throughout the winter in Wausau, this early setback was enough to limit snow mold development throughout the entire winter. In general, what happens early in the winter regarding snow mold development is more important than later in the winter because of the time required for these slow-growing fungi to grow and infect turf.

CONTROL UNDER HEAVY DISEASE PRESSURE

The research trial at Marquette provided an excellent test of the 83 treatments

FIGURE 3



Air temperature during November and December of 2017 at Wausau, Wis. and Minocqua, Wis.

under extreme snow mold conditions. In fact, the snow mold pressure observed at Marquette probably was the highest pressure I observed in the 12 years I have conducted snow mold research at Wisconsin (Figure 4). Not only were the non-treated controls obliterated, treatments with only one or two active ingredients often had levels of disease similar to the non-treated areas. Despite

the intense pressure, a surprising 22 out of 83 treatments provided 90 percent disease control or better (Figure 5). An additional 10 treatments provided 80 percent disease control or better, which under the intense pressure observed probably is enough snow mold protection for 90 percent of golf courses in temperate climates.

Continued on page 36

Continued from page 35

Nearly all successful treatments in this trial had certain characteristics in common. They all contained at least three active ingredients from different chemical classes, which is important in providing greater knockback of

the snow mold fungi in the days and weeks following the application. In addition, nearly all the successful treatments also contained a demethylation inhibitor (DMI) fungicide as one of the active ingredients. DMI fungicides are highly effective against gray

and speckled snow mold, so locations that experience extended snowfall and where these snow molds are common should contain a DMI in their mixture.

Lastly, most successful treatments also included a contact fungicide (Turfcide 400 (PCNB, AMVAC), Daconil WeatherStik (chlorothalonil, Syngenta), Medallion (fludioxonil, Syngenta), or Secure (fluazinam, Syngenta)). It's not entirely clear why the contact fungicides are important for snow mold control in heavy pressure, but possible explanations could be broad-based fungal suppression or increased persistence in winter environments relative to other modes of action.

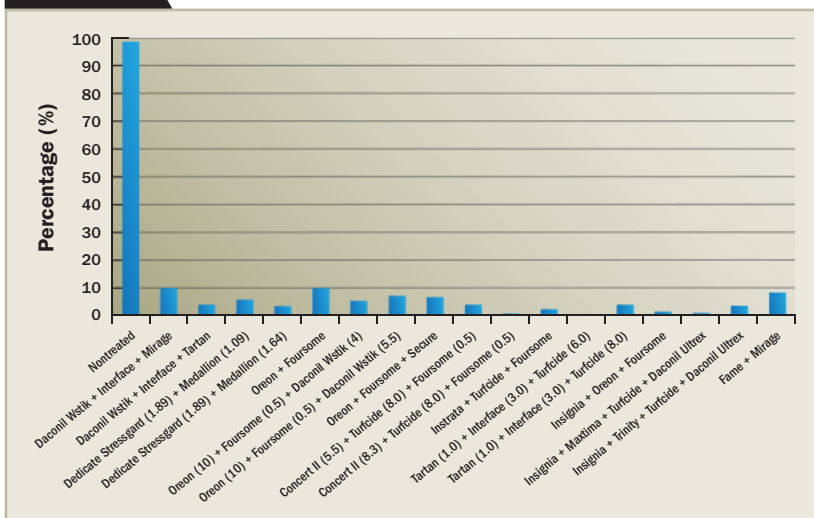
Readers may access the full Marquette report, including pictures of each treatment, at our Turfgrass Diagnostic Lab website (<https://tdl.wisc.edu/results>) in the "Snow Mold Fungicide Trials" section.

FIGURE 4



Intense snow mold pressure at Marquette CC provided a strong test of the treatments.

FIGURE 5



Treatments that provided greater than 90 percent snow mold control (i.e. less than 10 percent disease) under intense snow mold pressure at Marquette CC during the winter of 2017-2018. Experimental compounds were excluded from this list but can be observed, along with the full report, at <https://tdl.wisc.edu/results>.

CONTROL UNDER LIGHTER DISEASE PRESSURE

The decision to control snow mold and what products to use are relatively straightforward when you know you're going to experience significant snow mold pressure. However, winters in many locations have become so variable in both temperature and snow cover that many superintendents who spray for snow mold in the southern Great Lakes, southern Midwest and much of the Northeast don't need to spray at all or can spray fewer products. In fact, we have observed snow mold in the non-treated controls of our southern Wisconsin snow mold locations just twice in the last nine years, and in both cases disease was 20 percent or less.

One thing I've learned after 13 years in snow mold research is that superintendents hate to tinker with their snow mold programs. This is understandable because snow mold (unlike many other turf diseases) gives you only one shot to get it right, and it's a large investment for most clubs. However, most superintendents will agree (and climate data

support) that snow depth and duration of cover has become more variable in the past 15 years, and this variability disrupts the growth of snow mold fungi and decreases snow mold severity.

Simply put, I believe most courses outside of the snowiest areas (i.e. lake-effect snow areas, far northern U.S. and the Rocky Mountain West) experience less snow mold pressure today than they did 20 years ago.

Could superintendents still spray four active ingredients on 30 acres of fairways even though they haven't seen snow mold in 20 years? They could, but they might be able to achieve significant savings without sacrificing disease control by exploring other options.

These other options depend on what kind of pressure exists on the course over multiple years. To measure this, leave an unsprayed area or put down a 4-foot by 4-foot piece of wood prior to spraying as a check plot allowing you to assess disease pressure. Conduct a check plot in multiple winters in approximately the same area to assess differences in snow mold pressure between years. It's unlikely your course experiences high pressure if you observe disease symptoms taking up less than 10 percent to 15 percent of the non-treated area the following spring, meaning changes to your snow mold program may save you money without a decrease in control.

Options for savings include spraying fewer active ingredients and spraying fewer areas of the golf course. I generally don't recommend drastically decreasing protection for putting greens, because they are the highest-value areas of the course and typically take up only two to three acres. You may find much larger savings on fairways, and reducing the number of active ingredients being applied to fairways from three to two or two to one can result in significant savings when multiplied over 30 acres. In addition, reserving the highest level of protection (three or more active

ingredients) only for areas of the course that tend to see the longest snow cover also can result in significant savings. This might include low swales where snow collects, heavily wooded areas or areas of poor drainage.

These decisions ultimately lie with the superintendent, because any disease that develops is his or her responsibility. However, superintendents looking (or needing) to reduce the amount of money spent controlling snow mold have some potential options based on their location and disease pressure. Test all options on site in a small area of the course prior to widespread implementation to ensure achievement of proper disease control. 🍷

Acknowledgements

We're lucky to have great industry support in our snow mold research, which is not easy because our trials are so large they require us to take up almost an entire fairway. Huge thanks to Craig Moore at Marquette CC, Jay Pritzl at Timber Ridge GC in Minocqua, Randy Slavik at Wausau CC and Eric Leonard at Cherokee CC in Madison for hosting snow mold trials in 2017-2018. In addition, thanks to GCSAA and the Wisconsin Golf Course Superintendents Association for funding the snow mold work investigating proper application timing at Timber Ridge GC. Lastly, thanks to The Andersons, AMVAC, BASF, Bayer, Intelligro, Nufarm, PBI-Gordon, Quali-Pro/Adama, SipcamRotam (now known as Sipcam Agro) and Syngenta for testing products in the trials in Madison, Wausau and Marquette. Our research wouldn't be possible without their support.

Paul Koch, Ph.D., is an assistant professor in the Department of Plant Pathology at the University of Wisconsin-Madison. Please call (608-262-6531) or email (plkoch@wisc.edu) Paul with any questions, comments or concerns you may have.

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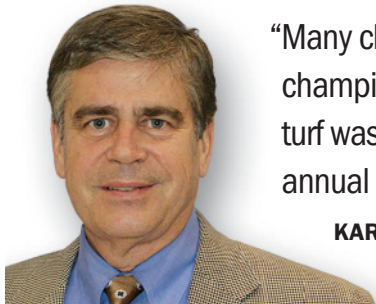
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“Many clubs didn’t want to host a major championship in August because dying turf was a possibility, especially with annual bluegrass (*Poa annua* L.)”

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

The PGA Championship’s future challenges

We’re all excited for this month’s 100th PGA Championship at Bellerive Country Club in St. Louis. Although the club is more than 100 years old, members in 1955 hired Robert Trent Jones Sr. to identify a site and design a new golf course. Since opening in 1960, the club has hosted all major professional championships held on a rotating basis (U.S. Open, U.S. Senior Open, PGA Championship and Senior PGA Championship).

I expect outstanding conditions from Carlos Arraya, CGCS, his full-time staff and volunteers, huge crowds (St. Louis is a great sports town) and the best professional golfers in the world. I also expect the weather to be blisteringly hot and humid. Not that Bellerive would be the first PGA Championship where heat and humidity are an issue. Past championships have been played in tropical, sub-tropical and transition zones of the United States.

The PGA Championship is played throughout the United States, and superintendents can produce quality golf course conditions under stressful conditions. This hasn’t always been the case. Many clubs didn’t want to host a major championship in August because dying turf was a possibility, especially with annual bluegrass (*Poa annua* L.). “Plague” often was used to describe turf loss — a combination of factors, often unknown, that caused summer

decline of annual bluegrass and other cool-season turf.

Research and new product developments have led to management programs that increase the likelihood of optimal playing conditions during summer stress. A prestigious club located anywhere in the United States now can potentially host the PGA Championship.

That will change next year, when the PGA Championship moves to May. The schedule change fits the PGA Tour’s overall goal to finish the season with the FedEx Cup by Labor Day. I’m excited about the change, which will have the Players Championship in March (moved back from May), the Masters in April, the PGA Championship in May, the U.S. Open in June and the Open in July.

The downside of moving the PGA Championship: May. Typically, the Memorial Tournament in Dublin, Ohio is the first PGA Tour stop on a “northern”

golf course. Under the new schedule, the PGA Championship is two weeks prior to the Memorial. Playing the PGA Championship in locations like Farmingdale, N.Y., Bedminster, N.J., Rochester, N.Y. and Newtown Square, Pa. will present challenges, many due to unpredictable spring weather.

For perspective, the Memorial Tournament changed its dates to early May from 1989 through 1991. The change, in part, was to attract more international players, who had conflicts with European championships later in the month. During the three years, as you might expect, the weather fluctuated considerably. Some tournaments were sunny, others cold and wet. Traditional midwestern weather.

I suspect superintendents will be faced with pushing courses to “get them going” at a time when the turf isn’t ready for it. Delivering tournament conditions in mid-May starts not in the week of the tournament, but several weeks prior. Early spring practices that focus on pushing turf could result in detrimental plant responses that manifest themselves later in the year. The challenge for superintendents — in some ways like summer tournaments — will be how to create the best playing conditions at a time not conducive to those conditions.

Another daunting challenge: Provide a quality course presentation. Most clubs want the course and grounds to look great on television, but how, for example, do you get trees in the Northeast or upper Midwest to leaf out? Northern golf courses traditionally look good in summer and not so good in early spring.

Given the potential for poor weather in early May, the PGA Championship may end up being rotated among courses found in the South and on the West Coast, which will be sad.

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

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// PHOTOSYNTHESIS AND RESPIRATION

When it's hot, it's hot

Jack Fry, Ph.D., is a turfgrass scientist at Kansas State University. Jack conducts research on water use, physiology and zoysiagrass cultivar development and teaches students and turf professionals. You may reach Jack at jfry@ksu.edu for more information.

Q Briefly define photosynthesis and respiration.

Photosynthesis is the process of a green plant with chloroplasts, in the presence of light and water, taking in carbon dioxide and transforming the carbon into a sugar, which is stored energy. The enzyme rubisco catalyzes the initial fixation of carbon to a larger molecule.

Respiration is the reverse of photosynthesis — taking sugars and consuming them for energy (sugars plus oxygen) while producing carbon dioxide and water. Respiration takes place in all living cells, green or not, such as leaves, stems and roots.

Q In cool-season grasses, what is the relationship between air temperature and the rate of photosynthesis and respiration?

Photosynthesis increases from the upper 30s to 70 degrees F, starts to decline when air temperatures are in the low 70s and declines rapidly as air temperature reaches 90 degrees F. The rate of photosynthesis drops by half as the air temperature increases from 70 degrees to 90 degrees F.

Respiration increases with increasing temperatures until about the mid-90s F,

then it declines as well.

At air temperatures of 75 degrees F and above, photosynthesis declines while respiration increases, resulting in an energy imbalance, and eventually an energy deficit. In other words, energy consumption exceeds production when air temperatures increase above the mid-70s.

Q What are the long-term consequences to cool-season turf plants when respiration exceeds photosynthesis?

The long-term consequence is the potential for starvation, particularly at mowing heights used on putting greens, especially in summers like 2018. The plant can continue to grow (sustain itself) if reserve carbohydrates are present. Once reserves are gone, the plant will begin to lose tissues that it can no longer support, usually beginning with roots, and working to shoots.

Q In warm-season grasses, what is the relationship between air temperature and the rate of photosynthesis and respiration?

Warm-season grasses are more photosynthetically efficient at higher temperatures and the rate of photosynthesis increases from

50 degrees to 95 degrees F, with the ideal temperature for photosynthesis at 80 degrees to 95 degrees F. The rate of respiration increases as temperature increases to about 95 degrees F. Above 95 degrees F, the rate of respira-

adequate water for plant health so the plant can cool itself. Make sure the green receives full sunlight all day by removing and/or trimming trees. Good air flow across the green also helps the plants cool themselves.

AT AIR TEMPERATURES OF 75 DEGREES F AND ABOVE, PHOTOSYNTHESIS DECLINES WHILE RESPIRATION INCREASES, RESULTING IN AN ENERGY IMBALANCE, AND EVENTUALLY DEFICIT.

tion in warm-season grasses starts to decline.

One of the challenges of managing warm-season grass putting greens comes in spring and fall, when the grass is green, but the rate of photosynthesis is low because of cool temperatures. Warm-season grass under these conditions produces little energy, resulting in stress and disease outbreaks.

Q Are there practical steps a superintendent can take to increase photosynthesis and decrease respiration in cool-season grasses during periods of high temperature?

Go back to the photosynthetic reaction; more green leaf tissue equals more “engine” to manufacture sugars because of more cells and more chloroplasts. Raise the mowing height and/or alternate days of mowing and rolling. Provide

Q Is there anything else you would like to add?

A well-conceived set of maintenance standards during difficult weather can be a big help to everyone at the golf course. Maintenance standards set the long-term direction for the course and include expectations and maintenance strategies during times of extremely stressful hot weather. Standards that include more realistic expectations for putting greens during extended periods of hot weather and a focus on keeping the turf alive keeps everyone working toward the same long-term goal.

Communicating what the problems are and what steps you've taken to address them also is critical to surviving a long, hot summer.



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



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// MUST-HAVE NEW EQUIPMENT



1 | A-Model fairway mowers

The 6080A, 6500A (pictured) and 6700A models leverage all of the fairway mower technologies from **JOHN DEERE**'s award-winning A-Model family of fairway, rough and trim and surrounds mowers. These A models emerged from a customer need for improved budget control while still offering a fairway mower designed for the rigors of fairway applications. The models are equipped with a powerful 24.7-hp diesel engine, three-wheel smooth tire configurations and premium performance and comfort features. Additionally, the models boast exceptional cut quality, thanks to the standard LoadMatch feature.

Deere.com

2 | BRD-2620 bed redefiner

ECHO's BRD-2620 bed redefiner replaces the BRD-280 as a lighter, more powerful unit. It's seven times faster than using a shovel and is lighter in weight than walk-behind bed redefining units. The product's six-finger cutting steel claw uses carbide-tipped steel. Key features of the BRD-2620 include a two-ring piston, improved hot-restart ability and a two-stage air filter. The air filtration system has a foam pre-filter, along with a pleated filter enclosed by a tool-less cover.

Echo-usa.com

3 | Typhoon Deep Water Aeration System

ATLANTIC's Typhoon Deep Water Aeration Systems have everything needed to circulate, aerate and maintain ponds and lakes up to 4 surface acres in area and up to 45 feet in depth. Choose from four different systems, each with heavy-duty, long-lasting rocking piston compressors. All systems feature our innovative Deep Water Diffusers, 100 feet of 3/8-inch black weighted tubing per diffuser, full-flow manifold with nickel-plated brass flow adjusters and push-lock fittings, glycerin-filled pressure gauge and pressure relief valve, all mounted in a power-vented, double-walled cabinet for security and noise suppression.

Atlanticwatergardens.com

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5



6



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4 | ABI Force groomer

The **ABI** Force groomer loosens, grades and rakes with precision because of its zero-turn platform, patented and controllable downward force and the optional laser-grading package. With its light footprint, the ABI Force has reinvented renovating tee boxes, greens and tight ground-prep jobs. With the optional aerator, fertilizer spreader and cultipacker, the ABI Force is a must-have for golf course maintenance departments, the company says.

ABIattachments.com

5 | HF600 fairway mower

The HF600 from **JACOBSEN** mows expansive fairways, has the precision to trim around trees and bunkers and the durability to master the deepest roughs. This new model also gives the operators the choice to mow with three, four or five reels. Additionally, the HF600 can perform scalp-down with ease. The HF600 is equipped with a 65-hp Kubota diesel engine, ergonomic seat and controls mounted on an adjustable armrest.

Jacobsen.com

6 | HoverPro hover mower

The **TORO** HoverPro hover mower series has a light footprint and is designed to mow forward, backward or side to side. This flexibility makes the series ideal for tackling tough areas such as steep slopes, sharp undulations and areas near water, Toro says. Three HoverPro models are available to fit a range of applications. The compact 16-inch HoverPro 400 is for hard-to-reach slopes, the 18-inch HoverPro 450 is for all-around versatility and the powerful 21-inch HoverPro 550 quickly covers larger areas faster. The HoverPro 400 has a nylon wire cutting system, while the HoverPro 450 and 550 use a metal-edge swing-tip blade.

Toro.com

The 19th Hole



Brandon Richey

SUPERINTENDENT // Lake Nona G&CC, Orlando, Fla.



What can I get you? IPAs have been hitting my tongue just right lately... Cigar City has one called Jai Alai that's excellent.



most people know us for the Tavistock Cup, the event between us and Isleworth.

How did you and (wife) Stephanie meet? When I worked at Sea Island, she was the merchandiser for the pro shop. Every morning I'd call in to report on conditions. I fell in love with her voice first and then I got to know her.

What teams do you root for? I graduated from N.C. State, so they have half my heart. I also root for Auburn because I spent part of my childhood in Alabama. It's 50/50 and I can be swayed either way, depending on who is winning.



Tell me about Lake Nona G&CC. It's a 30-year-old club with a very prestigious membership that includes world-class athletes. It's got a rich history of events, including the inaugural Solheim Cup, but

What's your favorite tool in the shop? A good ol' ball mark tool. I can fix ball marks while at the same time getting a good feel for root density and moisture.



What's your most cherished piece of sports memorabilia? I've got a signed flag from Davis Love III, thanking me for hosting his event at Sea Island. It reads, "To Brandon, thanks for your hard work." I also had Chris Kirk, the winner, sign it. Davis brought it down to the shop himself and handed one to me and the assistant. He's a big part of Sea Island, he's like the ambassador there.

When was the last time the crew got excited, and what was the occasion? I'd like to tell you it's every morning before we send them out — we try to get them jazzed up each morning. But in reality, it was when we took a long lunch the other day to watch the Brazil-Mexico World Cup match. But it wasn't the result they wanted.

What's the coolest or craziest thing you've seen on the golf course? The coolest thing I saw is also the craziest thing. I saw a bald eagle and an osprey wrestling over a redfish in mid-air. And the osprey won! It's a big bird, but it was half the size of that bald eagle.

You're flying to Scotland tomorrow for the Open Championship and some golf. What part of the trip are you most excited about? I was fortunate to go to Ireland in 2015. I'm looking forward to seeing the Open at Carnoustie, seeing the course in all its glory. And I want to enjoy the culture — I had such a great time in Ireland, I expect much of the same in Scotland.

As interviewed by Seth Jones, July 16, 2018.



// BEST ADVICE

"THE FIRST SUPERINTENDENT I EVER WORKED FOR, BOB ERICKSON, TOLD ME, 'THE GOLF COURSE WILL ONLY BE AS GOOD AS THE CREW IS.' I TOOK THAT TO HEART, AND I TRY TO LEAD AND INSPIRE EVERY DAY, AND HOPEFULLY THE GOLF COURSE WILL FOLLOW SUIT."

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JOHN DEERE

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The 100th PGA Championship is coming to Bellerive Country Club in 2018 and Superintendent **Carlos Arraya**, his crew, and volunteers from all over the world will be ready for the last PGA Championship to ever take place in August. Joining them every step of the way will be John Deere. "I don't think there's a single piece of equipment we can pinpoint that's not done well," says Carlos. "With all that goes into a purchase of this size, I can tell you that John Deere gets five stars because of all the things that they have communicated."



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Program Eligibility

Golf course superintendents that purchase two Contend Winter Solution Pallets and comply with Program Requirements as set forth below ("Eligible Participants").

Program Period

August 1, 2018 – December 7, 2018

Program Requirements

Eligible Participants purchasing two pallets of Contend Winter Solution ("Qualifying Purchase") during the Program Period will receive a Harman Kardon Onyx Wireless Speaker ("Incentive").

This Program is subject to the following:

- 1) Syngenta reserves the right to modify or discontinue the Program at any time for any reason.
- 2) All Program Eligibilities and Incentives are subject to audit, and no Incentives will be awarded in the event of noncompliance with Program Requirements.
- 3) Program is subject to product availability.

Program Redemption

Eligible Participants will be identified based on reported end user data from Syngenta Authorized Distributors/Agents/Retailers. Syngenta will provide any Incentives earned under this Program on or about January 31, 2019. Notwithstanding anything to the contrary herein, Syngenta will not be liable to pay any Incentive with respect to purchases for which Syngenta has not yet received payment. Contact your Syngenta Representative, Syngenta Authorized Agent/Distributor or the Syngenta Customer Center at 1-866-SYNGENTA (796-4368).

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