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GRINDING THROUGH TWO ON No. 2

Excerpts from **PINEHURST'S KEVIN ROBINSON'S** daily U.S. Open journal. *Plus*, industry analysis on those two weeks in June.

INSIDE

War on weeds / **P 22**

Brauer: While we're young! / **P 44**

Aquatrols debuts
new technology / **P 50**



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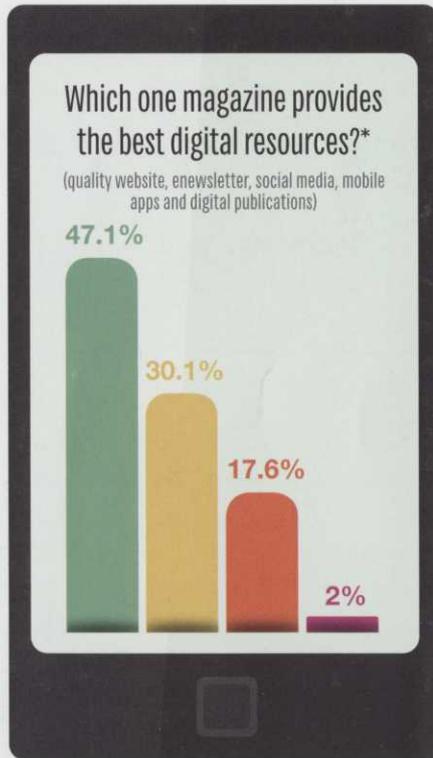
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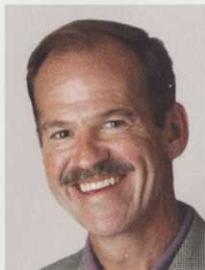
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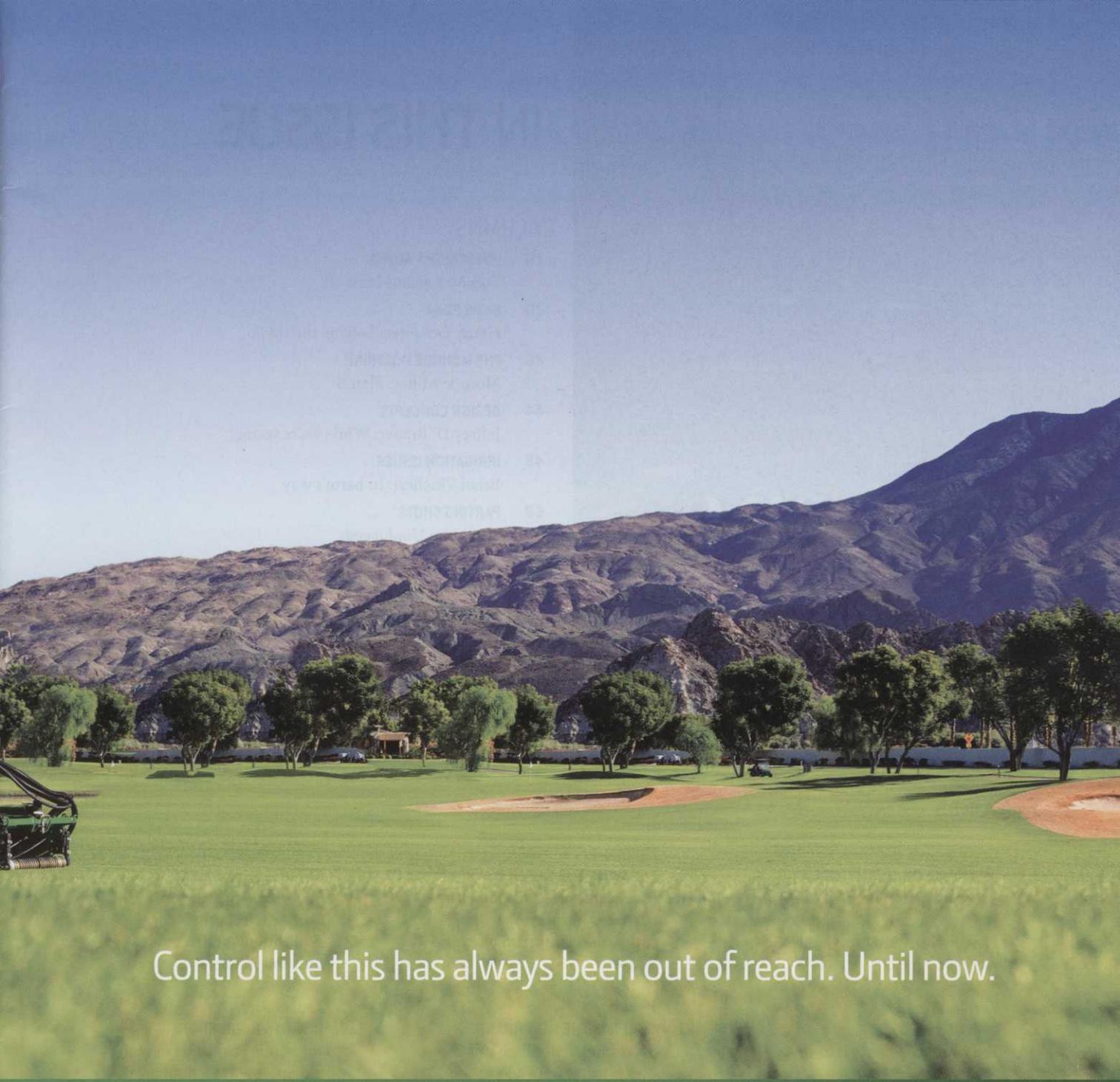


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FISHING FOR IDEAS

Those of you who know me well know that, given a choice between five hours of golf and five hours of fishing, I'll always choose the latter. Golf makes me crazy because I suck at it. I probably suck at fishing too, but I've never ended up frustrated, angry and ready to quit forever after wetting a line.

There's something zen-like and deeply relaxing about spending time trying to trick a fish into thinking they're about to enjoy a tasty meal when, instead, it's the other way around. I love the whole process of fishing and the repetition of casting. Every cast is a new hope...a chance to battle nature using the simplest of weapons. Actually catching something is almost a nice bonus. Boating a fish is merely icing on the cake.

Last month, I went off the grid up in northern Ontario with a great group of friends to a place called North Caribou Lake. You can read more about the trip in my back-page column, but the short version is that it was fishing nirvana. We fished our brains out for 12 hours a day for an entire week. We caught hundreds of walleye and big, nasty northern pike. It was hot, it was cold, it was wet, it was dry...and it was totally awesome. Best guy trip ever.

Anyway, the awesomeness came to an end as I deplaned back in Cleveland to face the reality of work, family and real life in general. As I thought through my big, scary to-do list, I realized it was time to do a different type of fishing. This time, I'm fishing for ideas.

It's been four years since I assumed the helm of GCI and I feel pretty good about what we've done. The most important thing is we largely turn over the editorial content to experts like Bruce Williams, Tim Mor-

aghan, Henry DeLozier, Monroe Miller, Dr. John Kaminski, Bill Brown, Terry Buchen, Jeff Brauer, Brian Vinchesi and a host of supers who contribute regularly.

We've also dramatically expanded the number of platforms we use beyond just the magazine and website to include en-

ewsletters, our mobile app, Twitter, Facebook, amazing podcasts on the Superintendent Radio Network and more. We have a great editorial team with Mike Zawacki, Kyle Brown and Guy Cipriano working their butts off to produce great useful content every day.

The only thing missing is...you.

I'm fishing for your ideas for our 2015 editorial plan. What solutions are you look-

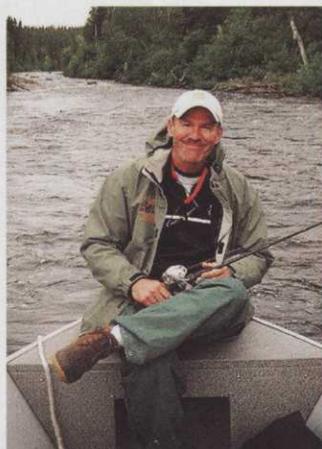
ing for? Do you need ideas about how to manage people better? Are you trying to figure out a way to reduce inputs? Are there specific emerging pest/disease issues that have you stumped? Are there experts or authors you wish you could learn more from? Are you struggling with water problems or trying to convince your ownership to fund a renovation?

In short, what's on your mind?

A couple of years ago, Tim Moraghan said that GCI is at its best when we're covering the topics that are being whispered about in the hallways outside turf conferences and chapter meetings. That's what I want to hear about. What information do you need to be more successful, more rewarded and more effective in years to come?

My name is at the top of the masthead, but GCI is your magazine. Let me know what your article ideas and education needs are and we'll put them into the big editorial machine and do our best to help.

So, I'm casting my bait here. If you want to bite, I'm at pjones@gie.net. GCI



Pat Jones
Editorial director and publisher

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{ EDITOR'S NOTEBOOK }

When superintendents golf

Trip to Midwest for John Deere Golf Pro-Am reaffirms importance of seeing game from golfer's perspective.

By Guy Cipriano

Andrew Foy golfs once a week. He doesn't loft drives and stroke putts to relax or satisfy competitive desires.

Foy squeezes regular play into a crammed schedule for work-related purposes. His job as the superintendent at the Valley Club of Montecito requires him to satisfy the golfing desires of the California club's members.

"I don't play for fun," Foy says. "For me, it gives you a different aspect. From the agronomy side, you are going out there and looking at certain stuff. When you are actually playing, you are looking and hitting the ball from some areas that I would never normally go into. I might hit it from behind a tree and see something that I would never see."

Foy joined superintendents and club managers from 23 states and six countries on July 7 to experience tournament golf from a participatory perspective as part of the John Deere Golf Pro-Am at the TPC Deere Run in Silvis, Ill. The pro-am coincided with the PGA Tour's John Deere Classic and paired superintendents with colleagues and a tour player.

Superintendents didn't play the back tees like the pros – 500-yard par 4s aren't for everybody – but they hit from the same fairways, rough, bunkers and greens. Playing the D.A. Weibring-designed course the week of its annual PGA Tour appearance represented a once-in-a-career opportunity for many participants. "You don't get out and see tournament-style courses all the time," says Kurt Strother, superintendent at Eagle Ridge Golf Resort in Galena, Ill. "It blows you



away instantaneously."

Strother, like Foy, spent part of his round analyzing TPC Deere Run's agronomic features. The maintenance shed behind the fourth tee and pump station along the fifth hole were parts of the course ignored by pros yet admired by superintendents.

Golfing on a regular basis represents an item on a superintendent's to-do list that often doesn't get accomplished. Spending four more hours on a golf course following an 11-hour workday is difficult to justify. But superintendents agree that golfing should be part of their job description.

Shawn Emerson, director of agronomy at Desert Mountain, a 108-hole facility in Scottsdale, Ariz., asks his superintendents to walk the course with putters and wedges. Even something as simple as hitting a few putts and chips can help a superintendent obtain a player's perspective.

"We're hurting ourselves by not do-

ing more," Emerson says. "We say we want to grow the game, well, we are not playing enough to grow the game. We keep saying we need people to play more golf. We need to play more golf. You see it from the perspective of the player. It makes a big difference."

Eagle Ridge consists of 63 holes, leaving Strother with little time away from the course. But playing on somebody else's energized Strother.

"We all have the mentality that we need to play, but we don't because we spend enough hours on the course as is," he says. "But we do like to play and we need to see it from a golfer's eyes. What you see here is not so much a comparison to the golf course that I'm working on, but it gives you a sensation of what you are doing and what these guys are doing to prepare for an event like this. You almost get a little recharged from it. You take it back to your own course and do some of the attention to detail work."

California enacts statewide water restrictions for golf

State water board approves emergency regulation requiring local cutbacks.

Kyle Brown

Water districts throughout California are required to develop and activate water contingency plans, after an emergency resolution passed by the State Water Resources Control Board July 15.

The board, a department within the California EPA, adopted the resolution to mandate minimum conservation efforts across the state. Under the rule, local water districts with a water shortage contingency plan must put it into practice.

For golf courses, that conservation must limit irrigation of ornamental landscapes with potable water to no more than two days each week or implement plans to reduce water use by a comparable amount of a landscape's 2013 water use total, says Max Gomberg, senior environmental scientist for the State Water Resources Control Board.

"It's a little unfair," says Craig Kessler, director of government affairs for the Southern California Golf Association. "If you're dealing with golf courses that have been on restriction, that have invested in new nozzles, smart irrigation systems and removed acres of turf and gotten their water footprint substantially down in the last five or 10 years; then there's another golf course that's been completely profligate.

"Then you put percentages decreased based on a last year baseline - what you're doing is you're killing one course and doing a favor for the other."

Either restriction puts outdoor irrigation roughly in line with the 20 percent water use reduction requested by California governor Jerry Brown at the beginning of the year. They both should have about the same effect on the overall use total, Gomberg says.

"The message we're trying to send here is that everyone can do more, even if it's a little bit more," Gomberg says. "I think every golf course, even ones that have been good stewards of water, they can do more even if it's getting pinpoint-accurate about times of day and the amount of water that's applied to the green or leaving everything else unwatered or minimally watered."

The restrictions only affect potable water. There are currently no restrictions on the use of recycled water, which can be a resource for outdoor irrigation. Offering non-potable water as an alternative is "something we're really trying to promote in California," he says.

"There are a number of golf courses that are using recycled water to irrigate, and that's not covered," he says. "We really do recognize the great strides that golf courses have gone through."

The resolution puts those superintendents in a tough situation, since past efforts to bring golf courses and water districts together have delivered promising results.

Regardless of how those programs are implemented, golf courses and water task forces like the ones Kessler has helped build will continue to push for plans with lighter restrictions for golf.

From THE FEED



Large enough to fit a soccer ball. Three-and-a-half times the size of a regulation golf hole. Pink. The days of 4.25-inch painted white cups aren't over. But summer is tournament - and experimentation - time. Golf courses are using the season to unveil a different layer. Superintendents and their crews received the assignment of cutting and painting the cups. Twitter provided a forum to announce the twist.



Matt Dutkiewicz @Matty_Duck_75

Lots of compliments on the pink cup inserts during the Women's City Championship, next yr will have to paint pink as well



Kevin Hicks @golfsuper1992

And so the era of the 15" cup begins at Couer d'Alene Resort. Promo shoot today for the Big Cup Open Aug 3 kickoff.



Josiah Rokey @RokeyJ

Someone's going to have a surprise on #6 green. #15"cup #golf @GCImagazine.



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Tim Moraghan, principal, ASPIRE Golf (tmoraghan@aspire-golf.com). Follow Tim's blog, Golf Course Confidential at www.aspire-golf.com/buzz.html or on Twitter @TimMoraghan

TEED OFF!

Charging for tees would reduce the maintenance problems they create.

Is your golf course looking a little messy? I have a suggestion. Tell the golf pro to start charging for tees.

No, not tee times or T-shirts. Tees. Those wooden or plastic pegs that golfers grab by the handful then shatter and scatter all over the driving range and tee boxes. Not only do they make an otherwise clean course look ratty and unkempt, they're harmful to maintenance equipment and a waste of your staff's time and manpower.

I suppose I shouldn't be surprised that golfers take all the free tees they can and then are too lazy, discourteous or both to bend over and pick up the broken pieces after they've served their purpose. We should try to get golfers to treat used tees the way they do ball marks: Pick up your own and at least one or two others. Oh, wait, they do treat them the same: They don't fix ball marks, either. (Don't get me started on raking bunkers.)

I've been teed off about tees for some time. I recently played behind a foursome in which one of the guys left an unbroken four-inch tee on every tee box. I picked up all 18, fully intact and still stuck in the ground (how he managed that could be the basis for an instructional video), and after finishing I turned them into the golf shop and told the pro to put them back in the jug for the next golfer.

Broken tees on the tee box aren't just unattractive, they can wreak havoc with maintenance equipment. Or so I'd been hearing for many years. I recently asked some technicians with the leading maintenance companies if it were true and, indeed, it is. Tees can ruin bedknives and reels on mowers. Rotary mowers can handle

tee abuse, so maybe we can launch an education campaign that tells golfers to throw their used tees into the rough. But that still means they'd have to bend over and pick them up, so I guess that ain't happening.

Plastic tees aren't as harmful to mowers as wooden tees because wood has fiber and grain while plastic tees are molded and tend to snap rather than shear. The difference might not sound like much, but run over a few thousand tees a day and the damage will add up. Fast.

Both plastic and wooden tees can cause deflection/distortion to reel blades and bedknives, resulting in a poor quality of cut and additional stress to the plant. Think we can convince golfers to pick up tees by telling them that the broken pieces actually can ruin the quality of the turfgrass and therefore the playability of the course? Yeah, I doubt it, too.

You probably already know that

costs—moving tee markers, positioning the ball washer, emptying the trash, replacing divots; add to that blowing old broken tees away or picking them up before mowing. It all takes time and time is money.

Now take everything mentioned above and multiply it a few times for the practice range, where golfers rarely hit anything but their drivers, spraying shards of tees all over the place. I can understand that they don't want to walk out ahead of other practicers to pick up their broken tees. But why do they leave broken and unbroken tees in the hitting area, stuck in the ground, even in little piles?

And to anyone who suggests that the answer is biodegradable tees, I have one word: Yuck. On a hot, humid day, they quickly turn into a mess of fertilized goo in the pocket of your favorite golf pants or shorts.

So let's go back into the golf shop.

“And to anyone who suggests that the answer is biodegradable tees, I have one word: Yuck.”

manufacturers don't recommend trying to straighten or adjust a distorted bedknife. That means they need to be replaced, which costs \$40 to 80 each, plus labor, plus the downtime needed for the work to be done. Even worse is if the reel becomes damaged or the blades bend or snap: Replacement will set you back \$150 to \$300, plus labor and downtime.

Maybe you need to take the tee issue to your general manager or whoever is responsible for club finances. Remind him or her that setting up a teeing ground already involves labor

Tees should not be given out for free. Tees should cost something. How about 10 tees for \$1, and let the proceeds go to your junior golf program. (Golfers wouldn't pay for them if the sign said the money will go to replace reels and bedknives, but it really should.)

Will charging for tees solve the problem? Probably not. But it's worth considering, along with whatever can be done to help golfers realize that their actions, even as simple as leaving a broken tee on the ground, has consequences. **GCI**

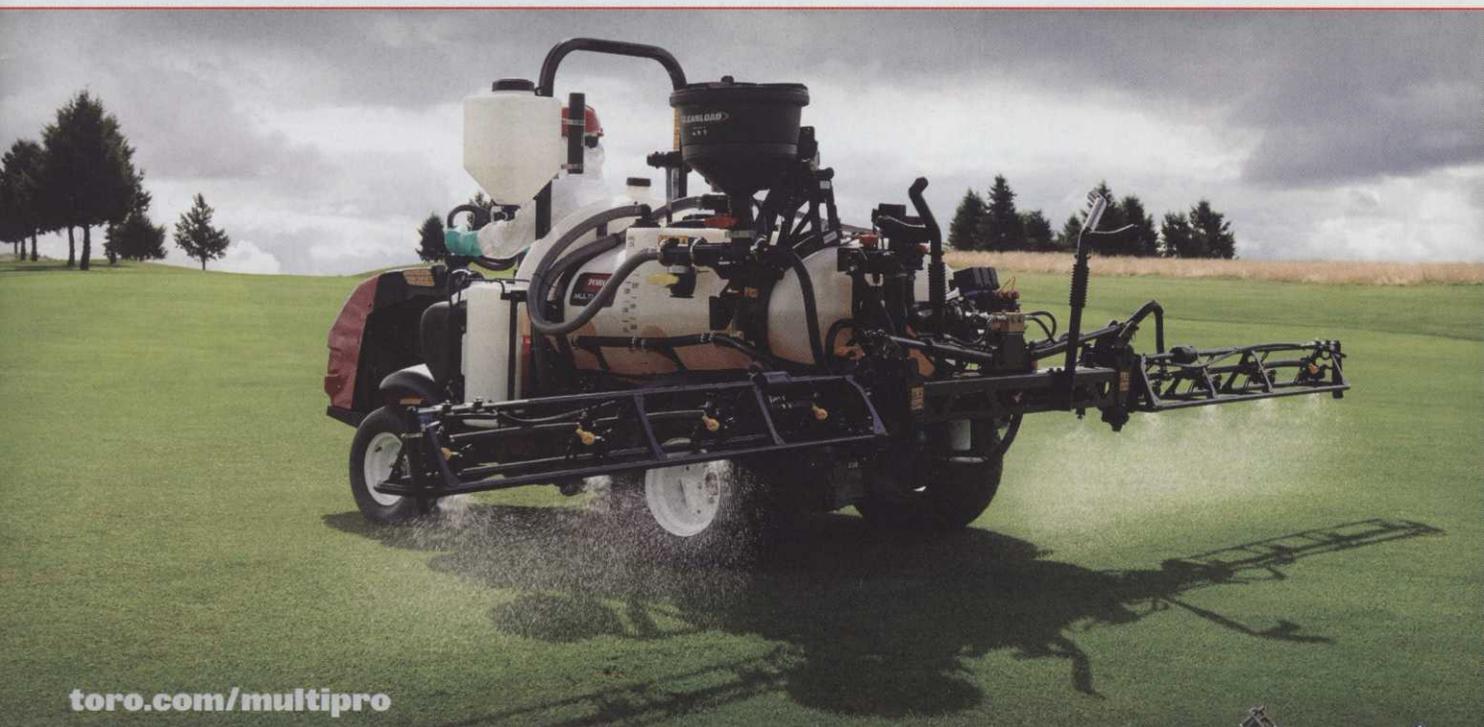
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COVER STORY

GRINDING THROUGH TWO ON No. 2

**Excerpts from PINEHURST'S KEVIN ROBINSON'S
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I

By Kevin Robinson and Trent Bouts

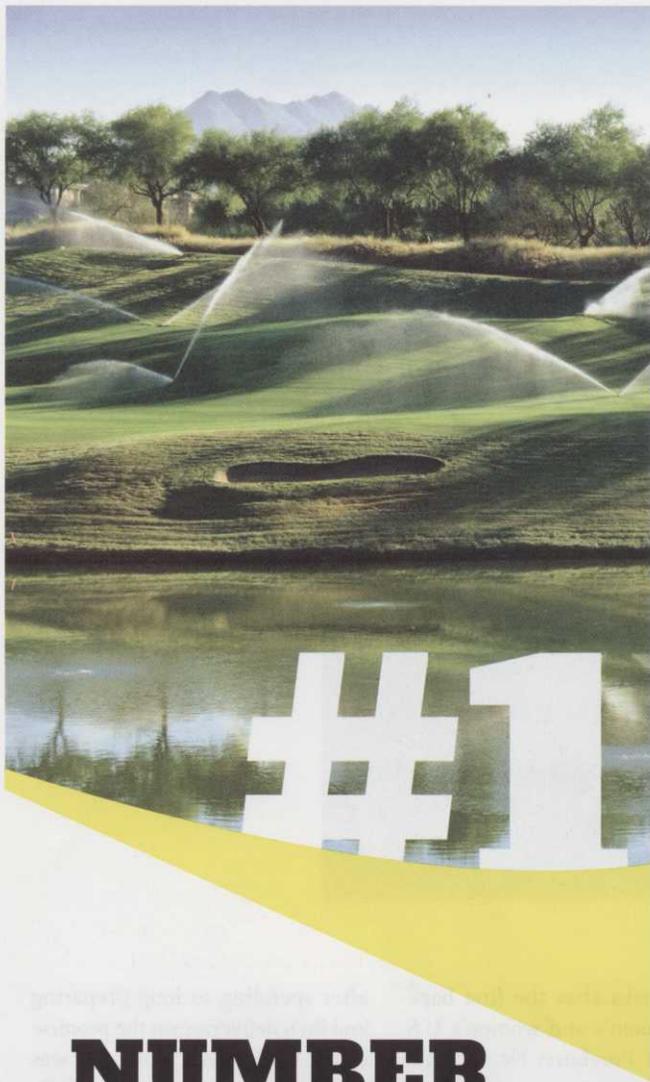
n the weeks after the first back-to-back men's and women's U.S. Opens at Pinehurst No. 2, certified golf course superintendent Kevin Robinson was dealing with a "letdown" in a "ghost town." The throngs that lined the course for two weeks in June were gone as were the bleachers themselves. Most significantly, though, so were the bentgrass greens that defied the heat, the traffic and the doubters by providing supreme putting surfaces lauded by the men and women.

Exactly one month after the final putt, Robinson watched as mowers made their first run over Champion Bermudagrass on No. 2. In between, he had "three days at the beach with the kids." It wasn't much of a break for a man who'd averaged about four hours sleep a night for two weeks with the weight of an historic first on his shoulders. But

after spending so long preparing and then delivering on the promise of the dual Opens, Robinson was grateful for something new to dig his teeth into.

"It's been kind of like a ghost town here without No. 2 being open," he says. "There's definitely been a letdown. I mean, we were looking forward to the Opens for years, gearing up the whole time. Then it's over. Thankfully, the greens conversion is keeping us occupied."

Labor Day, when No. 2 reopens, is the next milestone. Here, with snippets from his own daily diary presented by GCI and the Carolinas Golf Course Superintendents Association, is a glimpse of the grind that Robinson and his team put in to pull off the most ambitious feat in the history of America's national championships.



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COVER STORY

SUNDAY, JUNE 8

Right now I've just had a shower and lay down on the bed. It feels like the first time I've drawn breath all day. I'm watching LeBron James knock down a couple of shots late in the third quarter against the Spurs. I doubt I will see many more, though. I'm ready for sleep.

It's also the first time I've had a chance today to stop and think about what we're about to do here with the back-to-back Opens. Man, it's a rush. There's just no time during the day. We're so busy the time just flies by.

We are set up really well for what's ahead, barring any weather catastrophes of course. The greens are so healthy right now. The next two weeks are pretty huge. I know I'm feeling some — butterflies that is - but what a cool feeling to have.



Pinehurst No. 2 superintendent Kevin Robinson, second from right, received help from numerous colleagues during the weeks of the U.S. Opens, including fellow resort superintendent Kyle Brown, left, and assistants John Jeffreys, second from left, and Alan Owen, right.

MONDAY, JUNE 9

Today was a practice round for us too and we learned a lot. There were some kinks to iron out, but I guess you're gonna get that when you're trying to mow greens in the dark.

One thing we didn't anticipate was the logjam that the security checks caused. This was the first day they've had security in place and there was just one guy scanning badges as we crossed the road from the maintenance facility to the golf course. That doesn't work real well when you've got close to 100 people and machinery revved up and ready to get started.

The atmosphere amongst everyone on the crew this week is tremendous. It got even better today when my mom and my youngest daughter, Grace (11), brought the crew a big batch of chocolate chip cookies.

Don't try this at home without thought

Golf course superintendents and operators enamored by the 2014 U.S. Open might want to temper their enthusiasm before turning off irrigation heads and halting fertilizer and pesticide purchases.

Tim Moraghan, a former Pinehurst superintendent and principal of ASPIRE Golf, admires the look of Pinehurst No. 2 and the decision to emulate the course's original design. But he says your course might not be ready to follow the hard, brown message the USGA sent via Pinehurst. Moraghan helped prepare championship courses for the USGA from 1986 to 2006.

"Any superintendent that wants to proceed down this path I congratulate them, but make sure your members are educated on what you are going to do and what they are going to see," he says. "I don't like a wet golf course; I like a dry golf course. I like bounce and roll, but I want a health environment. The communication to your members, guests, daily-fee players, whomever is your clientele, you really have to communicate what they are going to see because this is not what anybody is really accustomed to seeing. You don't work for the USGA. You work for your members, your guests and your daily-fee players. It's their money you're spending on the golf course or trying to save and hopefully you're trying to save some money. My question is when you go down this path and lose your job, where's the USGA going to be. Are (Executive Director) Mike Davis, (Green Section managing director) Kimberly Erusha and (President) Tom O'Toole going to call your club up and go, 'Wait a minute, you shouldn't let this guy go because he's doing what we think is in the best interest of the game?'"

Moraghan is "all for" reducing inputs on golf courses. Selling American golfers on major maintenance overhauls consisting of less brown and more green, though, presents challenges.

"Taking it to such extremes is where the average player goes, 'I get it, but I don't really want it to look this bad because I'm paying for this,'" he says.



ship to begin but I have to admit I had to step back for a bit today. Getting up at 3:30 a.m. and being at the golf course til 9 p.m. or later catches up after a while. I've been running on coffee in the mornings but today after the morning work was done I had to take a nap.

THURSDAY, JUNE 12

If we dodged a bullet Wednesday, we got nailed between the eyes just now. We were just working out how much time (irrigation) to put on each of the greens based on the moisture readings. Then the skies opened up just after 9 p.m. We got just under an inch, $\frac{9}{10}$ ths, in about 30 or 40 minutes. All you could see was standing water everywhere.

Until the storm just now, everything had been fantastic. The golf course was great. It looked like a British Open. I caught a few glimpses on TV when we were back in the break room at the maintenance shop while we were working out the afternoon schedule. It was kind of unreal to feel that excited seeing it on TV when the real thing was back over my shoulder. It made me feel like a kid.

TUESDAY, JUNE 10

The bunkers are a talking point, for sure, with plenty of questions about where the waste areas end and the bunkers begin. We've been working with the USGA on how we rake them. The good thing is that all the bunkers are inside the ropes unlike Whistling Straits, where Dustin Johnson got into trouble. Honestly, I think come Thursday it will be a non-issue.

The weather is not looking ideal, with a 60 percent chance of rain tomorrow and more temperatures in the 90s. But the forecast has been changing so much you can't be sure. We might give the greens a little drink in the morning just in case it doesn't rain. It's a marathon, not a sprint. This is a two-week "tournament" after all.

WEDNESDAY, JUNE 11

The winds peaked at 34 mph. There was

pine straw everywhere, tees, greens, surrounds. We had every backpack blower, tractor blower and Groundsmaster blower out there that we have. And it seemed like it was in no time that we had everything back as if nothing had happened.

Everyone is excited for the champion-

FRIDAY, JUNE 13

It was a beautiful day for golf, but I don't know what the spectators thought when

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they walked in this morning and saw five or 10 of our guys working in a bunker. It was a Herculean effort by our staff and the volunteers to get the golf course in such good shape to start on time. We had our

mechanics and spray techs out there. Ultimately, I was really proud of the effort, and the USGA was proud too and very thankful.

We had one hiccup tonight when one of our guys hit a communications cable, but

there was no major damage. I think the amazing thing is that with so many people and so much infrastructure that's been the "biggest" incident we've had.

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SATURDAY, JUNE 14

That was a really good day, really good. To see the golf course get its teeth back was great, and it sure did. Seeing putts rolling off the green on 14 showed just how small the margin for error was and that is what you want when you're trying to find the national champion.

I get to sort of piece together a picture of what's happening with the play by being out on the course and catching some of it on TV back at the shop or at the Fair Barn, which is our staff and volunteer headquarters. Honestly, I get chills up and down my arms when I see it on the screen.

SUNDAY, JUNE 15

One down. One to go. In 2010, when I found out I was going to be superintendent at No. 2, I got butterflies thinking about getting the chance to host the U.S. Open. I couldn't have imagined it going any better. And now we get to host a women's Open. So I guess we'll just show up at 4:30 a.m. and get everything mowed all over again.

There was a really cool moment late in the day as we were coming down the 18th with the last group. (Pinehurst owner) Mr. (Bob) Dedman and (president) Mr. (Robert) Padgett were walking and looked at each other and shook hands. Honestly, it put a tear in my eye to see those two men share a moment like that because they really deserved it. They made some huge, ballsy decisions to do what they did to this golf course.

It's pretty crazy when we get an inch of rain on one night and water the greens on two of the other three and yet they played like they did. It just shows the health they were in. Believe me if we wanted people (golfers) to cry "uncle," they would have been. The greens were so strong that we could have gotten them like concrete and still had them in shape for another week of

tournament play.

I am going to let myself have a couple of beers tonight to celebrate. We're not going out anywhere, just very happy to be home and relax with the family.

MONDAY, JUNE 16

This was a day to recharge for all of us. We got the morning shift taken care of then I think most of us found a spot and made the most of it for about two hours. The Fair Barn was full of guys in hammocks, on sleeping bags and cots. I lay down on the couch in my office and was all the better for it.

Bob Farren (CGCS director of grounds and golf course maintenance) might not be quite as refreshed as the rest of us. He had his family in for the end of the men's Open and his son Casey is from San Antonio. So apparently there were some happy – and loud – people at the Farren house on Sunday night when he was trying to sleep.

The early feedback from the women is that they can't believe the greens just went through a men's Open. The women just love how truly the ball is rolling.

I got a really nice email today from Matt Shaffer (host superintendent for the 2013 U.S. Open at Merion Golf Club). I know we all gripe about our profession at some time or another, but there are a lot of wonderful people in it. We've had a lot of them working with us this week and messages like Matt's just show there are a lot of others who are here in spirit.

TUESDAY, JUNE 17

There was a good cheer from everyone when (assistant superintendent) John Jeffreys made the announcement to go home and guys were happier still when he announced that the USGA had bought ice creams for everyone.

We have our eyes on the 10th, 12th and 14th greens. There's just a quirky little wind corridor through there and they dry out a bit faster than the others. They got a little hot at times last week so we're staying on top of them.



Pinehurst No. 2 superintendent Kevin Robinson hand waters a green during the U.S. Open. The course's bentgrass greens, which endured the stress of hosting two straight major championships, are being replaced by Champion Bermudagrass.

Outside of that maybe the scariest thing still is mowing greens in the dark each day. We have some guys serving as spotters, but even so we have had one or two instances where guys have mowed on into the Bermudagrass on their clean-up laps. It's nothing significant. We might be the only ones who would notice.

We had an interesting moment this afternoon right before our daily set-up meeting with the USGA folks. (USGA agronomist) Chris Hartwiger walked in and announced that his cart – and putter – had disappeared while he was taking some readings on a green. We've stressed to the guys from day one that they need to take the keys with them if they step away from any equipment. I think that's the only hiccup Chris has had all week. He and (USGA

agronomist) Pat O'Brien have both done a fantastic job.

WEDNESDAY, JUNE 18

The greens continue to do well, but I have to say we are in a position that's not one we're used to. Because of their firmness and the lower ball flight most of the women have, we are doing a good amount of hand watering to keep the firmness in check. That's probably not ideal for the long-term health of the greens, so it's a good thing they'll be replaced with the Champion once this is over.

I also had a really nice few minutes with my family (wife, Laura, Bailey 15, Sadie 13, Grace 11). Bailey was a standard-bearer in

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new tubers.”

Up next

By Guy Cipriano

Two interested U.S. Open observers at Pinehurst No. 2 maintain a golf course likely to produce a similar stir.

Chambers Bay director of agronomy Eric Johnson and superintendent Josh Lewis visited Pinehurst to gather information for their own championship experience. Chambers Bay, in University Place, Wash., opened in 2007 and will host the first U.S. Open contested in the Pacific Northwest.

The course evokes images of the Open played across the Atlantic Ocean. Chambers Bay is a links-style course with just one tree – and plenty of fescue and bunkers.

Chambers Bay and Pinehurst are located in contrasting ecosystems. Chambers Bay is on the Puget Sound; Pinehurst rests in the Carolina Sandhills.

"It's difficult to compare the two," Johnson says.

Still, the Chambers Bay duo left Pinehurst impressed.

"I thought they hit a home run, personally," Lewis says.

"That look might not be for everyone, but for me, I loved it. It was architecturally spectacular. Several players said the greens were the best they ever putted on for a U.S. Open. If somebody got into the wiregrass, it was 50-50 whether they had a shot, whether it was a good lie or bad lie. I thought for what they were attempting to accomplish, it was absolutely perfect. It gave us a lot of insight into the expectations of hosting one."

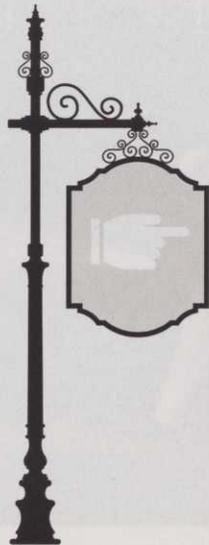
The analytics of maintaining a U.S. Open became apparent while in Pinehurst, with the duo analyzing firmness, moisture and shot data accumulated by the USGA. Less than two weeks after the tournament concluded, USGA Executive Director Mike Davis visited Chambers Bay, which underwent \$1.4 million in modifications following the 2010 U.S. Amateur.

Neither Johnson nor Lewis worked at Chambers Bay in 2010. Lewis arrived at Chambers in the fall of 2011. Johnson was hired in the summer of 2012 following superintendent Dave Wienecke's resignation.

Chambers Bay's biggest agronomic challenges stem from the fine fescue fairways and greens. Johnson and Lewis both previously worked at Bandon Dunes, a links-style facility in Oregon with fescue. Fewer inputs are required to maintain fescue, a cool-weather turfgrass. But fescue struggles to handle high traffic.

Johnson and Lewis will have plenty of help next June. Chambers Bay quickly filled allotted spots for U.S. Open maintenance volunteers, according to Johnson. The buzz extends beyond the golf maintenance community. Some are labeling the 2015 U.S. Open as the biggest sporting event ever contested in the Pacific Northwest. Lewis calls the past 2 ½ years a "whirlwind," but says Chambers Bays is ready for what awaits.

"It's about improving on what you have every day," he says. "That's the goal. We understand the U.S. Open is not tomorrow. It's next June. We are striving for consistency and we don't want to be peaking too early."



The brown look of Pinehurst No. 2 during the U.S. Open generated plenty of debate throughout the industry.

the men's Open and is again this week ... it was great to see them all just lapping up the excitement – and then wandering off to do the same with some ice cream. Watching them disappear into the crowds reminded me just how lucky I am to be doing what I love to support the family that I love.

One of the things I am noticing is not being able to run or go to the gym. And the food we've had has been so darned good it feels like if I'm not working, I'm pigging out. The good news is that the pants are still loose.

FRIDAY, JUNE 20

That was a good day that went awfully fast. We did well locating all the ball marks from the day before when they suspended play with groups still on the last three holes of each nine. We used flashlights and the maps the USGA gave us and it went very smoothly.

We did get a little rain burst at about 3 p.m., but again we were fortunate. There was no lightning involved so it didn't interrupt play.

All in all, things went really well and we were done with our evening shift and out of there by 8:30 p.m.

Everyone was feeling a little sluggish today. It's starting to catch up with us.

THURSDAY, JUNE 19

I guess the history is made now that the women's Open is under way.

The greens continue to hold up amazingly ... I almost think we could do the senior Open next week if we had to. If there was one thing I might have done a differently, it would have been to spray a wetting agent on the Monday after the men. One of the reasons we've been able to keep the greens so smooth is the finer sand we've used for topdressing. But it almost seals the surface off with all the mowing and rolling.

Past or future?

Did Pinehurst No. 2's new look represent golf's past or future? It's a question architect Bill Coore has pondered since the course he redesigned with Ben Crenshaw hosted back-to-back U.S. Opens.

"It was looking forward and it's looking backward at the same time," Coore says. "That presentation at Pinehurst was very directly linked to the origins of golf and it could very well be directly linked to future presentations, although certainly not in such a dramatic fashion."

Coore and Crenshaw's work restored the course to resemble the original design by architect Donald Ross. The restoration pleased Pinehurst Owner Robert Dedman Jr. and President Don Padgett II and USGA Executive Director Mike Davis. But it sparked spirited debate about the future of golf course aesthetics and maintenance.

"We had no idea it would generate the degree of conversation about the course and its presentation," Coore says.

In Coore's view, the enduring lesson from Pinehurst is simple: there are multiple means to obtaining great golf.

"Golf is not just played in pristine conditions where everything is perfect," he says. "Golf was a game born of nature. It's a game that can be played at the championship level and the recreation level in a very enjoyable fashion on courses that are presented in a more natural fashion. No one was trying to say that every course should look like Pinehurst No. 2 for the U.S. Open. It's just a way of saying, 'Look, there's a way to lay a golf course pretty quietly on a natural environment, allow it to evolve and change with the conditions Mother Nature provides. When it rains, it's green. When it doesn't, it's brown. And it plays extremely well both ways.'"



Golf course architect Bill Coore, left, with Pinehurst director of grounds Bob Farren.

SATURDAY, JUNE 21

We had our last setup meeting with the USGA folks at 2:30 p.m. We've been having them since June 4 so that's a lot of days when six or seven of us have gathered in the USGA executive office trailer, closed the door and dealt with the nitty-gritty. It has been very impressive how these meetings have been run. They've been all about getting the right result.

I expect tomorrow there will be a few moments when I might think about the last two weeks and what it means.

SUNDAY, JUNE 22

Little after 10 p.m. and we've just wound down "proceedings" at Maxie's, a little pub in the village. (Assistant superintendents) Alan Owen and John Jeffreys and me, and a few other folks got together to

celebrate. Everyone is so tired but excited and thrilled all the same. Back-to-back U.S. Opens. Man, that was so much fun.

One of the approach mowers developed a hydraulic leak during the morning setup, but we caught it immediately thanks to Steve Sheets (from Linville Ridge Golf Club) having an eagle eye and doing a first-class job of quality assurance. It turned out a filter was a little loose, and we got it fixed and didn't really miss a beat.

I did not expect to water greens as much we did over the two weeks. I told (women's Open championship director) Ben Kimball tonight that if he'd told me at the start of the month that we'd be watering greens that much, I'd kiss his backside.

It's been tremendous to be able to showcase the golf course in June the way it was designed to play. To have dry, firm conditions for two weeks and to be able to control, pretty much, how much water the course got was really a highlight. **GCI**

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Henry DeLozier is a principal in the Global Golf Advisors consultancy. DeLozier joined Global Golf Advisors in 2008 after nine years as the vice president of golf for Pulte Homes. He is a past president of the National Golf Course Owners Association's board of directors and serves on the PGA of America's Employers Advisory Council.

SOLVING THE RIDDLE

Resources for answering some of golf's most challenging questions.

Olbers' Paradox, named after German astronomer Heinrich Olbers, questions why the night sky is dark, despite the enormous number of stars, and how something that seems so infinite can be so definite.

The golf business holds similar, although less cosmic, riddles. The question for many is where to go for answers. Here are several questions for those who manage clubs and golf facilities, along with some information sources.

Q: HOW CAN I IDENTIFY AND RECRUIT MORE GOLFERS?

Top-performing clubs conduct regular reviews of their immediate market areas and their golfers to know the socio-economic profiles and psychographic characteristics of current and prospective members. The U.S. Census (us.census.gov) sorts people by age, gender, household income, educational achievement and family composition (as in how many children in the household). Census data and state or local property tax rolls estimate property values. The National Golf Foundation (NGF) has developed a golfer census that identifies golfers and helps facility managers increase participation and frequency. Sign up for the American Golf Census at ngf.org.

Q: WHAT ATTRIBUTES MAKE MY CLUB "STICKY" FOR GOLFERS?

Here are three reliable tactics that will make your golfers:

1. Use customer relationship management software to create profiles that include pictures so staff can quickly recognize members and prospects.

Then start developing a relationship. There are numerous reliable resources for relationship management, including clubessential.com, membersfirst.com, jonas.com and pipelineinc.com.

2. Get the golf course in the best shape possible, allowing for budget limitations and other reasonable local considerations. According to our research at Global Golf Advisors (globalgolfadvisors.com), courses in top condition post revenues 15 to 17 percent higher than their competitors.

3. Find out what is most important to your most important golfers. Reliable and consistent putting surfaces? Reasonable pace of play? Fun events where they meet others like them? Your best customers are eager to tell you what they want. Jon Last, who runs the Sports and Leisure Research Group (sportsandleisureresearch.com), is an excellent resource for consumer attitudes and trends.

“Women golfers significantly influence your results.”

Q: WHAT DO WOMEN WANT?

Women golfers significantly influence your results. Women represent slightly more than 50 percent of the U.S. and Canadian populations and control trillions in buying power. We know that women want to be respected and appreciated consumers. They want to play golf for its fun and social attributes. But a relatively small segment wants to compete in golf. They view golf — and clubs — as platforms

for socialization. So keep golf fun and include everyone. Martha Barletta's book "Marketing to Women" and her trendssight.com website offer great insight into today's women consumers.

Q: HOW DO I KNOW WHAT TO FORECAST FOR MY BUSINESS NEXT YEAR?

1. Weather influences your business as much or more than any other factor. Through CMAA, managers can access up-to-the minute weather status from WeatherBug (earthnet-works.com). NGF provides guidance through WeatherTrends International (wxtrends.com). Knowing whether the spring of 2015 will be warm and dry or cool and wet means a more accurate budget and cash flow forecast for your facility. Get it right!

2. Inflation is trending upward. According to the Federal Reserve Banks in Cleveland and Dallas, the median trend for Consumer Price Index (CPI) has risen steadily during the first half of 2014 to an annualized rate of 4.2 percent. Monitor inflation trends for your budget planning at usinflation.org/us. Budgets for golf courses are likely to increase during the remainder of 2014 and into 2015. In addition to the volatile costs of oil-related goods, trends in food stuffs for proteins, grains and coffee are up. Plan for increased costs.

3. Labor costs will increase. Increases in minimum wage and the desire to catch up on deferred wage increases at many clubs converge to indicate a trend for increased payroll costs.

While not as incomprehensible as the night sky, the answers to some of golf's most challenging issues are within reach, if you know where to look. **GCI**

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BY MOLLY MCNULTY

WAR ON WEEDS



From annual bluegrass to white clover, researchers tell us which weeds to expect this fall and how best to prepare for the battle.

With the stresses of summer largely in the rearview mirror, superintendents are turning an eye to their next challenge – fall weeds. Weed pressure will vary from region to region, but there's one thing you can count on everywhere: *Poa annua* almost certainly will be your biggest weed problem this fall.

Sure, some regions will encounter other weeds, but from north to south and east to west, *Poa annua* overwhelmingly will be a superintendent's chief nemesis. The good news is we've got the scoop on what you should be doing now to prepare for this all-important fight.

**ANNUAL BLUEGRASS
(*POA ANNUA*)**

In Michigan, where 2013 winterkill was widespread, toxic gases accumulated during long periods of ice cover. As a result, annual bluegrass greens were damaged, and in some cases, wiped out.

Those courses are going to have another rude awakening this fall, when annual bluegrass weed outbreaks will be high, says Michigan State University research assistant Aaron D. Hathaway.

“We had a lot of damaged or dead greens this year,” he says. “So a lot of people are reseeding greens with creeping bentgrass. As summer heats up, those plants will go through stress. Annual bluegrass will take advantage of that in the fall.”

Although many annual bluegrass greens died in Michigan from the harsh winter, *Poa* seeds still lurk in the soil ready to germinate. And *Poa* will resurface.

Michigan is hardly alone. As annual bluegrass pesters courses from coast to coast, superintendents in all regions of the country must find a way to control it at a time when its resistance to active ingredients in commonly used herbicides is giving it a strong upper hand.

**HERBICIDE RESISTANCE
PROBLEMATIC**

Bert McCarty, Ph.D., professor of turfgrass science at Clemson University in South Carolina, says weed pressure throughout his area likely will be normal this fall. However, in the face of herbicide resistance, turf managers are having a harder time controlling annual bluegrass.

“The amount of AB present this fall will probably not be

any different from years past,” McCarty says, “but as control becomes more difficult, it will appear outbreaks of this weed are heavier.”

Turf experts in virtually all regions of the country mentioned herbicide resistance as the premier foe in squashing annual bluegrass. So it’s not an unknown problem, nor is it a minor one. The prolific seed producer is building resistance to active ingredients in commonly used pre-emergent and post-emergent herbicides, removing important tools from a superintendent’s *Poa* arsenal one by one.

Compounding the problem, says James Brosnan, Ph.D., associate professor of plant sciences at University of Tennessee, is the fact that there have been few introductions of new herbicidal modes of action that could help manage resistance cases.

“Resistance has really started to increase across the transition zone southward during the last three years or so, and it’s continually gaining steam,” Brosnan warns. “I think five years from now this may be the biggest issue in weed management in turf.”

So what’s a superintendent to do in preparing for annual bluegrass this fall?

ROTATION, ROTATION, ROTATION

Superintendents can rotate their herbicides from year to year, most importantly. Rotating will lessen the chances of resistance to certain chemistries.

Using a combination of pre- and post-emergent herbicides is best, McCarty says. “One product alone will not control this weed 100 percent,” he says. “The important thing is to ro-



Annual bluegrass (*Poa annua*) weed outbreaks in Michigan are expected to be high this fall because of damage caused from 2013 winterkill.

STEVE DEWEY, UTAH STATE UNIVERSITY, BUGWOOD.ORG

tate the mechanisms of action of herbicides that are used so as not to rely on a single product.”

Brosnan stresses the importance of rotation, too, and points to the herbicide selection guide his team created to help. The guide color codes herbicides for *Poa* control by mode of action.

“Focusing on agronomics and integrated approaches for managing these weeds will help in resistance management as well,” Brosnan adds.

Timing of applications also is important. Seeds germinate in the cooler temperatures of late summer and early fall, when soil hits 70 degrees or below. Superintendents should be planning now for pre-emergent herbicide applications, especially if overseeding, McCarty says.

Once *Poa* seeds germinate, “that pre-emergent herbicide is not going to affect them, most of the time,” says Ramon Leon, Ph.D., assistant professor of weed science at University of Florida. “Superintendents who have their pre-emergent herbicides working well on time, meanwhile, will cut their post applications in half.”

Leon advises superintendents to monitor temperatures closely. If they drop earlier in the season, then superintendents better put their pre-emergents down earlier, too.

“Missing that temperature window is what causes a lot of those *Poa* escapes,” Leon says.

Superintendents who miss that window shouldn’t panic, however. Herbicides like Spec-ticle (indaziflam) and Echelon (proflumicafene and sulfentrazone) have “found a fit,” Brosnan says, because they can be applied later in the fall to control newly emerged *Poa* plants and provide residual control of those yet to emerge.

TROPICAL SIGNALGRASS

While *Poa* is a fact of life in Florida, superintendents in the central southern part of the state also have tropical signalgrass to grapple with this fall.

The troublesome weed forms like a mat. As it spreads, it competes with, and ultimately displaces, Bermudagrass. In the end, you’re left with large patches of signalgrass that keep growing up to 10 feet in diameter and are hard to kill, Leon says.

And when you do kill it? “You have on your golf course a 10-foot area with no grass,” Leon says. Equally as bad, the weeds will likely recover before the Bermudagrass does.

The good news, Leon says, citing McCarty’s tropical signalgrass research, is superintendents who treat for tropical signalgrass post-emergently in the fall have a good chance of

managing it effectively.

“Bottom line is, whatever you’re doing to control signalgrass, it seems you better do it in the fall,” Leon says. “Because you have a higher chance of reducing growth of the weed than if you do it in the spring.”

In treating for tropical signalgrass in the spring or summer, superintendents may see effective control at first, but if it survives, “conditions are favorable for the plant to keep growing,” Leon says. If you treat in the fall and the plant tissue survives and continues to grow, meanwhile, it will be met by cooler temperatures and a less favorable growing environment, Leon says.

WHITE CLOVER

It’s been a wet year so far in Dr. Nick Christians’ neck of the woods. The dampness will have an impact on fall weeds not only in his state of Iowa but elsewhere in the Midwest.

“It’s been a wet year and a wet year is good for clover,” says Christians, university

professor of horticulture at Iowa State University. “In wet years like this we see clover thrive on golf courses, and that’s what’s happening.”

That’s a problem because clover – usually found on fairways – disrupts the uniformity of golf courses, Christians says.

Given the wet conditions, he expects to see higher populations of white clover on Midwestern courses this fall – and he encourages superintendents to treat for it this fall.

“Don’t let it go until spring,” he says. “If you put down your broadleaf weed controls in September, October, even as late as November, it will knock out what’s there in one application.”

Ample products will give superintendents good white clover control, he says, especially MCPP or triclopyr.

NUTSEGE AND KYLLINGAGRASS

In the Mid-Atlantic, it’s hard to predict which weeds will pose problems for golf courses this fall, says Elliott



Damp conditions should result in an abundance of white clover this fall. The weed, which is usually found on fairways, disrupts the uniformity of golf courses, according to Dr. Nick Christians of Iowa State University.

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L. Dowling, agronomist for the USGA Mid-Atlantic Green Section.

However, purple and yellow nutsedge and kyllinggrass are challenging courses, he says. Careful application is required on such cool-season grasses, he cautions, especially during the summer heat.

“Many superintendents defer treatments until the weather breaks in the late summer or early fall,” Dowling says. “But populations expand throughout the summer. These weeds are perennial, so they must be controlled or populations will return and increase each year.”

Dowling urges superintendents to begin their post-emer-

gent applications for sedges and kylling as soon as possible.

Goosegrass and crabgrass populations also may pose a problem for Mid-Atlantic courses this fall, Dowling says.

“On golf courses where Bermudagrass is the primary turf, pre-emergence herbicide applications were delayed or skipped because of fears of winterkill after the cold winter,” Dowling explains. “They wanted the Bermudagrass to have every opportunity to recover and didn’t want to slow recovery with pre-emergence herbicides.”

The result, he says, is crabgrass and goosegrass populations that must be controlled

post-emergently.

If post-emergent treatments are not performed on time – and Dowling says they should begin soon – superintendents in the region can expect to see higher outbreaks of crabgrass and goosegrass this fall. Post-emergent applications definitely will be required, Dowling says, and “products such as quinclorac, fenoxaprop-ethyl and sulfanyl ureas can be used, depending on the species of desirable grasses present.”

But before superintendents apply anything, he cautions, they should check product labels for rates, timing and potential interactions with weather conditions.

BOTTOM LINE

A superintendent’s battle against weeds is perennial. But with wise judgment, effective cultural practices and attention to labels, greenkeepers can hold their own.

MSU’s Hathaway urges superintendents to communicate and keep up with research. “Winters like last winter will prompt a lot of research on what we can do to avoid that winterkill,” he says. “Often it’s the new things that superintendents try that prompt research. Often research is driven by their creativity.” **GCI**

Molly McNulty is a freelance writer based in Cleveland, Ohio.

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Monroe Miller retired after 36 years as superintendent at Blackhawk CC in Madison, Wis. He is a recipient of the 2004 USGA Green Section Award, the 2009 GCSAA Col. John Morley DSA Award, and is the only superintendent in the Wisconsin Golf Hall of Fame. Reach him at groots@charter.net.

PLAN B

Preparing for post-superintendent life eliminates fear of losing employment.

When I retired from golf course management on Dec. 12, 2008, I felt a huge sense of relief. It was sort of a “wow, I made it” kind of emotion. I was 62 at the time, and I have since learned that many newly retired people experience the same feeling.

I had no notion of a

paid late a couple of times and almost missed house payments,” or “I wasn’t paid all winter.” Sometimes veterans were released and replaced by a person clearly making a lower salary.

However, it is a great job, traveling my home state, working to gin up support for the turfgrass program at our land grant university

B. It would ease the pain in tough times when the job market is tight and our savings are low, leaving people with no or too few good options. Jobs end, but expenses don’t. Severance packages can be stingy, unemployment runs out and stress is unavoidable. A well thought out, plausible path to follow could alleviate the fear people have of losing their employment.

Golf course superintendents have many job skills that can be applied to a wide range of careers. Many who have left the golf course have migrated to sales. And that is a good choice. They have instant credibility with customers. Think about the colleagues you know who have made the change from course management to something else. I know a former superintendent whose Plan B led him to the presidency of a major Midwest nursery. Others have moved to the management of a turfgrass ARS at a land grant college. I know former superintendents who became golf course construction managers. Some of the most prosperous have swept up lawn care franchises and managed them into successful businesses.

Don Hearn and Jack MacKenzie are doing great work as GCSAA chapter managers. Another has his

own aerifying company; still another did that with a fertilizer application business. I even know a former superintendent who became a college professor (likely you know him, too).

A colleague of mine left for law school, and a past GCSAA president has been a practicing attorney for years. A friend started growing hops, not a bad Plan B as his enterprise grows. A former employee of mine left for a lucrative position in landscape management because he was sick of working weekends. He had a viable Plan B. A former superintendent runs our UWEX Turfgrass Diagnostic Lab. The examples of potential Plan Bs are practically endless.

Considering a Plan B is not disloyal, blasphemous or disrespectful of our profession. Sometimes survival depends on a change, and I contend that at least thinking about it and even planning for it would be a good thing to do. Keeping a current resume, networking and even enrolling in an online course can be part of your Plan B. You cannot count on the good luck that came my way – it may never come. If you are backed into a corner, the stress and anxiety will be a lot lower if you can have a Plan B for your family and your career. **GCI**

“Golf course superintendents have many job skills that can be applied to a wide range of careers.”

part-time job, although some volunteer time at our course was on my mind. Colleagues in the Wisconsin turf industry asked me to work part-time as an ambassador for the Wisconsin Turfgrass Association, so I decided to give it a try. I am still at my second career.

My first mission was to get former members to re-up. More times than I care to remember, I was confronted by circumstances like “no more optional spending” or “no more memberships.” Sometimes dues came from travel budgets, and travel/education budgets were often slashed. I could handle those circumstances and still present my case. Worse were cases when the superintendent would tell me something like, “I was

when discretionary spending has been under stress. The downside has been that I have seen this heartbreak and collateral damage. It’s been depressing to see severe cuts, position downgrades (full-time to part-time), vehicles taken away, retirement plans cancelled and staff reductions.

I have always had such lofty and idealistic notions about our profession. It was a great career for my 40 years of involvement. But we are no different than bankers, builders, businessmen, farmers and other professions – when the economy tanks, so do jobs.

Windshield time can be thinking time, and what I thought about quite often as I drove down the road is the notion that we all should have a career Plan



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FROZEN DOWN BELOW

BRUTAL WINTERS LIKE THE ONE EXPERIENCED THROUGHOUT THE COUNTRY IN 2013-14 TEST IRRIGATION SYSTEMS – AND CATCH SOME SUPERINTENDENTS BY SURPRISE.

BY GUY CIPRIANO

Turf wasn't the only part of many golf courses reeling after the harsh winter of 2013-14.

Beneath the surface, irrigation pipes were tested by the freeze that didn't thaw. Or, in some places, the freeze nobody saw coming.

"This was the spring that just didn't want to get here," says Paul Roche, national sales manager for golf at Rain Bird. "Golf course superintendents were really challenged. The weather was never really good enough to do their normal spring routine and bring their courses in line like they typically do. A lot of golf courses sustained winter turf damage, let alone irriga-

tion damage.”

Extreme conditions in New England introduced superintendent Patrick Daly to a reality resting beneath the Framingham Country Club turf: the Massachusetts course’s 14-year-old irrigation system is showing its age.

The course received its first snowfall in early December. The covering melted in early January, but more snow and below-freezing temperatures led to what Daly calls “the most severe” frost he has seen in 15 years at the club.

The pump station leaked. Rust entered the irrigation system. Heads cracked. Pipes broke.

“This was the spring that just didn’t want to get here. Golf course superintendents were really challenged. The weather was never really good enough to do their normal spring routine and bring their courses in line like they typically do. A lot of golf courses sustained winter turf damage, let alone irrigation damage.”

—Paul Roche, Rain Bird national sales manager for golf

When the staff refilled the irrigation system in April in a reverse order of the winterizing process – nearly every fairway has its own main line – the volume of leaks became magnified. The repair work stretched into June, challenging Daly and

his staff.

“We checked for leaks and initially we were looking at maybe 15 shells and then as we started running sprinkler heads, we started finding more shells popping on us,” Daly says. “It doesn’t sound like a

lot, but when you are chasing heads all over the place and we are trying to finish a construction project. ... It has been a long year.”

Irrigation consultant Jim Barrett, founder and president of James Barrett Associates,



says frost heaves, which are upward swelling of soil caused by freezing temperatures, were more prevalent in the north than recent winters. "I don't know how deep the frost went, but it went way below the sprinklers in my lawn," says Barrett, who lives in New Jersey. "And I think it went way below the golf course-type sprinklers."

Frost heaves will never be a major problem for irrigation systems in the south. But multiple cold snaps exposed systems to unfamiliar elements.

Dirk Hessman, southeast sales representative for Ewing Irrigation, heard stories of pump stations at southern

courses with frozen fittings, but he says problems occurred when winter lightning knocked out power. Some of the power outages went undetected for extended periods.

"You get wintertime lightning storms and the electricity seems to be more powerful," says Hessman, a former Georgia golf course superintendent. "You're not using your irrigation and a few things happen with the superintendent. No. 1, they are not using it, so they don't really see it. They look at it like out of sight, out of mind."

Last winter represented an anomaly in the south. "It happens every 10 to 15 years," Hessman says. But Hessman

“The people that kind of shut everything down and did everything they could to get the water out, they were able to get it out where it was exposed. They were the safe people. The ones that were like, ‘We had a warm winter last year. It’s not a big deal.’ Those are the guys that got hit harder than anybody.”

—Dirk Hessman, southeast sales representative for Ewing Irrigation

adds that prepared superintendents don't encounter as many major irrigation problems following a once-in-a-decade

winter. "The people that kind of shut everything down and did everything they could to get the water out, they were

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able to get it out where it was exposed," he says. "They were the safe people. The ones that were like, 'We had a warm winter last year. It's not a big deal.' Those are the guys that got hit harder than anybody."

The 40th parallel, which forms the Kansas-Nebraska border, is considered a dividing line when it comes to winterizing an irrigation system. Most superintendents above the line use an air compressor to blow out their systems. But superintendents just south of the line face tricky decisions. "They might need to run irrigation occasionally because you can go through a dry spell where your grass can get pretty dry, even Bermudagrass in the wintertime," Hessman says. "If it desiccates too badly, it can die."

Daly doesn't need to irrigate in the winter. His crew blows out Framingham's irrigation system in late November and turns it back on in early April. Irrigation system damage caused interruptions to early season maintenance routines, but he knows the problems could have been worse.

"Believe me, with the horror stories I heard from this past winter about dead greens, fairways and tees, I will take digging up holes and fixing irrigation," Daly says. "We came out of the winter relatively unscathed on our greens. We were very fortunate. The thing is communication. Our members know we are having irrigation issues. They are seeing us in the ground digging up stuff and fixing stuff all the time. I have already told them that the irrigation repair line will be way over budget this year." **GCI**

Guy Cipriano is GCI's assistant editor.

PREPPING FOR THE FREEZE

Preparation represents the best way for an irrigation system to endure a brutal winter.

For courses in the north, a system blowout is major part of a winterization plan. Dirk Hessman, a sales representative for Ewing Irrigation and former golf course superintendent, says there's a "science" to blowing out an irrigation system with an air compressor.

Hessman recommends a blowout pressure of 30 to 50 psi to minimize the damage on pipes and rotors. A gentle blowout is also recommended by Rain Bird's Paul Roche, who says superintendents have improved their winterization tactics in the last 20 years.

"We believe there was a lot of damage to irrigation just done by blowing compressed air into the sprinkler heads and components," says Roche, the company's national sales manager for golf. "Blowing air compressors at a lot lower pressure and thereby putting a lot less stress on the system is key."

The typical blowout of an 18-hole course lasts two days. The same amount of time is required in the spring to return a system to operating form.

An overlooked part of a winterization plan includes a system's electrical components. If irrigation isn't needed during the winter, Hessman recommends disconnecting power in the controller and wires as a preventative measure against power surges caused by lightning. "Disconnect whatever you can," Hessman says. "Don't make it hard on yourself in the springtime."

One tactic that doesn't work is entering the winter and spring on a whim.

"I think having a good winterization and spring startup checklist is one of the best things a golf course superintendent can do and they should really follow up on those checklists religiously," Roche says. "Make sure they get implemented and make sure you allocate enough time to implement them so that when you really do need the irrigation system, it is ready to go."

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Spraying the savings

Precision Turf Management practices in spraying helping superintendents trim chemical budgets.

By Guy Cipriano

The retrofitted sprayer arrived at Oglebay Resort in Wheeling, W.Va., where a giddy maintenance crew prepared the unit for its debut by filling the tank to normal levels.

The unit sprayed 18 greens. When it returned to the shop, superintendent Nick Janovich noticed enough remaining substance to cover three more greens.

The application confirmed what Janovich unearthed through chats with colleagues, number-crunching and trials on demo units: Precision Turf Management (PTM) principles implemented in spraying are yielding significant savings.

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Janovich had two sprayers retrofitted to provide GPS-guided systems based on the premise he would save at least 15 percent on chemical costs. The results of Oglebay's initial greens application with one of its own retrofitted units suggest to Janovich the hilly, 72-hole facility made a wise investment.

"I can believe with the system that's accurate to an inch that we can save 15 to 20 percent," he says. "There are guys saying they are saving 25 to 28 percent. That personally might be a stretch, but I would say that 15 percent is a very, very fair estimate."

A superintendent from a course with a modest budget sparked Janovich's interest in GPS spraying.

Mark Kuehner is the superintendent at 7 Springs Golf Course, a family-owned public facility in Elizabeth, Pa., outside Pittsburgh. Kuehner became aware of PTM practices in spraying when a local sales representative introduced him to a GPS unit.

Kuehner's initial reaction? "I told my rep, 'That's great for a private course. But there's no way that something that costs \$70,000 is for me,'" he says.

A year later, Kuehner is an advocate of GPS spraying. 7 Springs purchased a GPS-guided sprayer through a five-year financing plan in April 2013. "If we could save \$15,000 per year, it would be great," Kuehner says. "If we could save \$25,000 per year, it was a no-brainer."

7 Springs saved \$27,000 in chemical costs last year, according to Kuehner. "We laugh at it now," he says. "It's like a license to print money."

SPRAYING LESS, SAVING MORE

Before using GPS technology,

Kuehner says 7 Springs calculated it had four acres of greens. Precise readings trimmed the area that needed sprayed to three acres. Similar reductions were made in the volume of pesticides applied to the course's fairways and tees. "It makes sense, especially if you are spraying pesticides," Kuehner says. "You don't want to be overspraying. What we're doing now is environmentally friendly and cutting back on the acreage you're spraying, which cuts the waste on fairways, greens and tees."

Courses with substantial maintenance budgets are also exploring the practice.

Adam Mis, the superintendent at Brookfield Country Club in Clarence, N.Y., maintains turf at what he calls a "high-end private club." His search for a new sprayer started at the 2014 Golf Industry Show in Orlando, where he encountered Marcus Thigpen, owner of NuTec Soil. Thigpen directed Mis to a sales manager offering a Toro demo retrofitted with NuTec's GPS-guided technology mounted to it. NuTec's system can be mount-



ed to existing equipment. Brookfield's 2014 maintenance budget allotted money for a new sprayer to replace a 13-year-old unit. But the GPS-guided unit Mis saw in Orlando cost \$30,000 more than the club budgeted for a sprayer. Mis explained the benefits of GPS-guided spraying in an email to the club's board of directors, greens chairman and general manager. Brookfield's decision-makers granted Mis permission to purchase the unit, which also features the Toro Clean Rinse System.

The first time Mis used the

unit, he filled a 300-gallon with 280 gallons of spray designed to distribute 80 gallons per acre. "I think I had 50 gallons left," he says. "I'm like, 'Holy cow. I have to readjust everything. There's no overlap.' Add that up over time, and this thing will pay for itself. If you had a \$100,000 fungicide budget, you have to be knocking off \$30,000 out of that easy because you are not spraying as much. That's what I sold the membership on."

The systems at Oglebay and Brookfield use Real Time Kinematic (RTK) satellite navi-

The systems at Oglebay and Brookfield use Real Time Kinematic (RTK) satellite navi-

gation and are accurate to within an inch, according to Janovich and Mis. RTK navigation requires circling the course once before the initial application to determine the areas needing sprayed. The data is then stored into a computer, making it available for each subsequent use. Some non-RTK systems require circling the course before each application to determine boundaries.

Superintendents and spray technicians receive access to software that provides video replay of applications and accumulates data. Creating repeatable data is one of the many advantages to GPS spraying using RTK navigation, Thigpen says.

"It's going to go out and spray what you tell it to spray, it will spray where you tell it to spray and it will record everything, and then they can play it back on the software a week later or six months later," Thigpen says. "It does all your chemical reports for you. It does all your application reports for you. It does everything by the computer. It's totally self-sufficient.

The only issues with GPS spraying, according to Thigpen, arise when products are not agitated properly and tips become clogged. "That's human error," Thigpen says. "Once they figure that out, they will not have an issue."

FUTURE OF SPRAYING

Smithco is the lone vehicle supplier with its own GPS product on the market. Smithco's Star Command system debuted in 2012 and the company projects a \$15,000 annual savings on a \$50,000 chemical budget.

Toro is in the process of working on a GPS system, but marketing manager Steve Peterson says details won't be revealed until the 2015 Golf Industry Show in San Antonio. John Deere also has explored the possibility of producing a GPS-guided sprayer, but the company is keeping its timeline confidential, according to product manager Brooks Hastings.

John Deere introduced a GPS-controlled system to the agriculture market in 2006, and lessons learned from the agriculture industry are aid-

“We laugh at it now. It’s like a license to print money.”

— Mark Kuehner, superintendent,
7 Springs Golf Course, Elizabeth, Pa.

It drives itself, turns itself on and off. The only thing you have to do is fill it up and get it to the field or get it out on the hole.”

ing the company's approach to the golf industry. Benefits being reaped in agriculture through GPS spraying also apply to golf course management, Hastings says.

“Many of the same effi-

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“If you had a \$100,000 fungicide budget, you have to be knocking off \$30,000 out of that easy because you are not spraying as much. That’s what I sold the membership on.”

—Adam Mis, superintendent, Brookfield Country Club, Clarence, N.Y.



ciencies our agriculture products provide can also be attained in the golf environment,” Hastings says. “High performance, increased operator uptime and lower cost of operation through the use of GPS precision spraying are just a few of those benefits. The ability to keep accurate records and using less chemicals, labor and fuel lends itself to being an environmentally friendly and efficient solution also.”

Superintendents in areas with high humidity such as the East Coast, Great Lakes and Florida will likely see the biggest savings from using a GPS-guided sprayer, Peterson says.

“We are testing to make sure that what we offer will have a truly accurate savings of what we say it will,” he says. “That’s one of the reasons why we haven’t brought a unit out. We are flat-out doing our homework.”

Peterson, like many others in the industry, envisions GPS spraying becoming increasingly popular. “It will absolutely become the future of turf spraying, just like it has in the ag industry,” he says. “From what I understand in talking to some of the major ag sprayers, 70 to 80 percent of their sprayers go out the door with a GPS sprayer on it.”

A search to replace a 12-year-old sprayer sparked Clark Weld’s interest in GPS-guided units. Weld, the superintendent at Hidden Creek Golf Club in Egg Harbor Township, N.J., leaned on friends in the agriculture industry, which in most cases adopts new technologies before the golf industry, for input on GPS technology.

“Farmers are pretty freakin’ smart,” Weld says.

Weld purchased two 300-gallon GPS-guided units, which he started using in 2013. The crew at Hidden Creek maintains 55 acres of bentgrass turf and dollar spot represents a major problem from

May until November. Learning how to maximize a new piece of equipment and spending \$12,000 to purchase a tower because New Jersey isn’t as GPS friendly as some other states presented initial challenges. But Hidden Creek trimmed its chemical spending from \$124,000 to \$92,000 in 2013.

The software Weld uses provides data on more than 40 different elements, including spray pressure, type of application and elevation. “I’m at the tip of the iceberg,” Weld says. “It’s just amazing what you can do.” Mis, whose courses rests in the Buffalo suburbs, says he can input “as little or as much information” into his software program as he wants and his expanded chemical file provides comprehensive data to present to state or federal regulators.

Hidden Creek resides in a section of New Jersey densely populated with golf courses. No other course in the immediate area uses a GPS-guided sprayer. If a neighboring course purchases a unit, Hidden Creek could share the tower costs with another facility. So far, Weld is the only superintendent in his neighborhood implementing the practice.

“I understand that it’s going to take a long time for this to catch on,” Weld says. “If you don’t have a lot of acres, it doesn’t make a lot of sense. If I didn’t have 55 acres, if I was at 30 acres... I don’t know how quick you are going to recover the cost.”

For Janovich, GPS-guided spraying makes sense.

“Sometimes it’s hard to justify buying a greens mower or a fairway mower when you can spend a couple hundred dollars, throw some stuff at it and make it work,” he says. “Well, this is going above and beyond what we have and we can show that it was a great investment.” GCI

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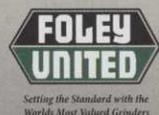


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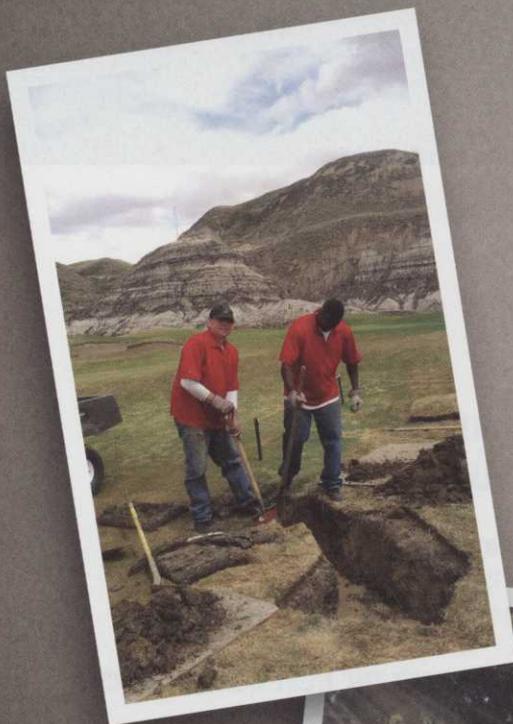
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BY RICK WOELFEL



Like most superintendents, Mitch Davidson's days at Dinosaur Trails Golf Club are full.

In his third season as superintendent at the semi-private facility in Drumheller, Alberta, about an hour northeast of Calgary, Davidson has some dedicated people working alongside him. In addition to his assistant, a mechanic and a full-time crew that numbers as many as eight, Davidson can count on the help of inmates from the nearby Drumheller Institution, a medium-security correctional facility.

Two Drumheller inmates work on the golf course while a third spends his workday as a porter in the clubhouse. As many as 10 additional

inmates are brought on board to assist with what Davidson calls "spring cleanup," or when the golf course is being aerated.

The club pays the inmates \$10 a day for their efforts.

"For us, it's a huge benefit," Davidson says, "because obviously we can save on our labor costs while still getting a lot of the little tasks done that sometimes can be missed because you don't have enough bodies to do them. They're doing a lot of the fine handwork. We have some gravel cart paths on the front nine so they're fixing potholes in cart paths.

"Some of them have worked in the logging industry so they're good with a chainsaw. So they'll be pruning trees or helping with irrigation breaks. They're really handy to have around for lots of projects and lots of day-to-day work."

The program is more than merely utilizing a cheap source

CHANGE

of labor. It's part of an effort by the Drumheller Institution and Correctional Service Canada to prepare inmates for life outside prison walls.

The inmate workers are transported to Dinosaur Trails by a prison guard and picked up at the end of the day. They provide their own work clothing such as boots and pack lunches.

The program was already in place when Davidson arrived at the club, but it's been expanded. The inmates also prepare plants for the club's flowerbeds.

"In January, I buy all the seed I need for growing flowers," Davidson says. "I bring them the seed and get them a bail of potting soil. They grow all the flowers for me and get them to the point where they're ready to be planted (generally in late May).

"I only pay for the seed and for a bit of potting soil. They do all the growing for me and bring

(the flowers) down here. Some years they have actually planted them for me."

Davidson actually visits the institution and interviews potential new hires himself. Most of the inmates involved in the program are serving time for non-violent offenses – but not all.

"A couple of these guys are murderers," he says. "They've been in jail for 25 to 30 years. But for the most part, it's drugs, theft, non-violent crimes."

The inmate workers face few restrictions when working at the club. They may not use a telephone and are barred Internet access. Davidson is required to check on them once per hour. But for the most part, the inmate workers are treated the same way as any other member of Davidson's crew.

"I have the exact same expectations for them that I do for the crew," Davidson says.

"They're treated no differently. They wear our uniforms, they sit and eat lunch with the crew. Each week or every other week, I'll take them into the clubhouse or the patio and I'll buy them lunch just to say, 'thank you,' because \$10 a day is not very much."

And the inmates need that \$10. Minimum-security inmates at Drumheller live in condominium-style accommodations. They cook for themselves and are responsible for buying their own food and personal items, which are purchased from a store located on institution grounds.

Security issues with the inmates have been virtually non-existent. In one instance a server in the clubhouse raised a concern; her husband was a corrections officer at Drumheller and did not want his wife working with any inmates. That request was accommodated.

But Davidson says the inmates have personal reasons for wanting to stay out of trouble.

"The guys that we utilize on our golf course are minimum-security guys," he says. "They're within usually six months of being released or going on parole. We haven't had any issues with any of them because they're so close to their release date that they don't want to do anything wrong.

"For the most part, it usually isn't an issue at all. Honestly, if



you see them on the crew, you wouldn't even know they were an inmate unless I told you. The members are aware of the program, but John Doe coming on the golf course probably wouldn't have any idea."

The program has produced some remarkable success stories. One of them is Ed (a pseudonym), a 55-year old who worked on Davidson's crew last year while serving time at Drumheller for bank robbery.

"He had two kids that were just getting into their teen years," Davidson says. "He was a great guy for us. He did a lot of pruning and always had a great attitude. He was well liked. He ended up getting out last fall.

"He's doing well. He's got a good job and is definitely getting back on his feet and is putting relationships back together with his kids. I really feel good for him."

Davidson takes pains not to judge the inmates.

"Everybody makes mistakes," he says. "A lot of them get put in circumstances and they make a bad decision. My thought is they're in prison and they're paying for their bad mistake. Everybody deserves to have that equal treatment until they show you otherwise." GCI

Rick Woelfel is a Willow Grove, Pa.-based writer and GCI contributor.



Jeffrey D. Brauer is a veteran golf course architect responsible for more than 50 new courses and more than 100 renovations. A member and past president of the American Society of Golf Course Architects, he is president of Jeffrey D. Brauer/GolfScapes in Arlington, Texas. Reach him at jeff@jeffreymbrauer.com.

WHILE WE'RE YOUNG!

Pace of play problems don't fall solely on golfers.

Golf has a pace of play problem. I can hear Jeff Foxworthy: "If a turtle passes you on the golf course... You might be playing too slow." The only problem is we all think it's the "other guy" and do nothing personally to play faster.

However, pace of play experts, like Steve Southard (www.paceandproduction.com) and Bill Yates (www.pacemanager.com) both say that, more often than not, the trials and tribulations of average golfers are NOT the main cause of slow play! Both note there is a difference between slow players and long playing times. And both conclude that management and design factors create bottleneck holes that slow play.

I know that is hard for most to believe, as even Yates cites one study where:

- Eighty-one percent of players missed the green of mid-length par 3 holes with their first shot (four shots).
- Of those, 37 percent missed the green again with their second shot (about three shots).
- And, of those, 14 percent missed it again with their third shot, reaching the green in four (about 0.23 shots).

That amounts to an average group using 8.04 shots to reach an easyish par 3 vs. the four shots required by par. The same ratio translates to 16/24 shots on a par 4 or 5, if not higher. But it's still not the problem.

The golf industry as a whole talks about slow play slowing growth and participation, and writes papers and convenes conferences where ideas are thrown around and initiatives

rolled out, all of which seem to die quickly. As with "big cups" and "shorter courses," golf seems pretty stuck in the mud most days.

The USGA has its catchy "While We're Young" slogan, which works better as a pick-up line at an old folk's home. Golf course architects sat on those USGA committees, but provided more generic advice than real solutions. And, because magazines tend to give awards for tough and photogenic courses, we usually design tough and photogenic courses when all the evidence points to golf having enough of those, and too

and Yates will be more than happy to share their research and knowledge, in book form or via consulting and site visits. Both have lots of worthwhile information – some of it downloadable for free.

I like to think of architects as the prime source of design information, but our educational pamphlets on the subject (even I penned an ASGCA "fast play" article years ago) tend to be based on "everyone knows..." theory. To give credit where credit is due, these experts base their recommendations on actual research. As I said last month,

“The golf industry as a whole talks about slow play slowing growth and participation, and writes papers and convenes conferences where ideas are thrown around and initiatives rolled out, all of which seem to die quickly.”

few designed for one of our biggest industry needs – faster play.

And maybe that is just the way things are. I have long figured that customized operational changes at individual courses are more effective than industry-wide campaigns. I was once partners in a public course with the Texas Legend "Buster" Creagh, who was famous for enforcing fast play, occasionally foregoing traditional Texas friendliness. His techniques included removing players from the course with a full refund if they promised not to come back.

According to Southard, if you want faster play at your course, you have to rely on ... you. No one else is coming to your rescue, although he

the best way to manage something is to measure it first, which they have done.

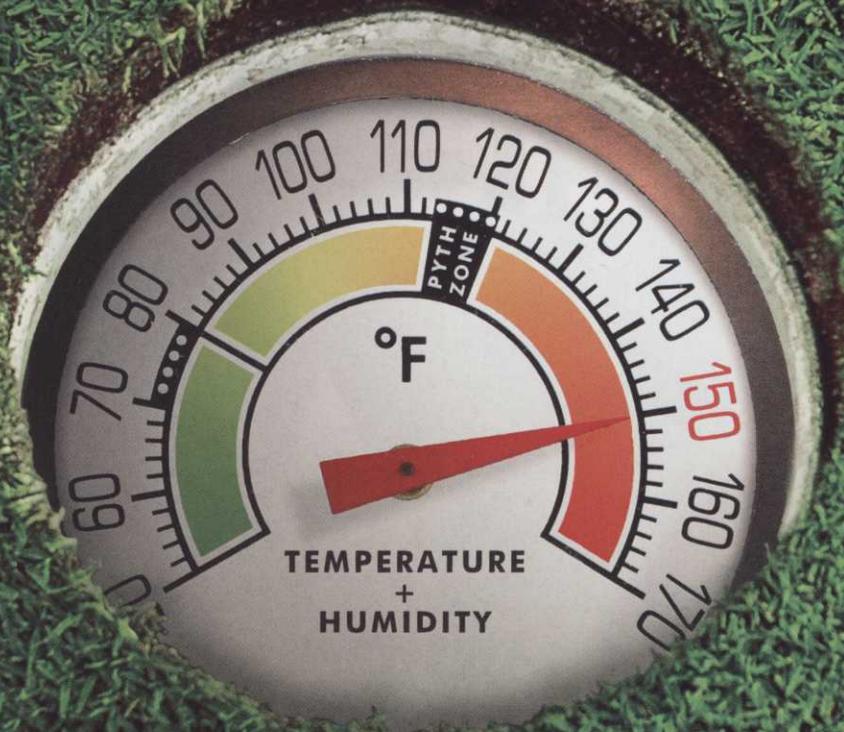
While this is a design column, most courses need to manage the problems their design has given them. A sampling of tips from Southard:

- Beverage carts can be a problem. He recommends either stationary refreshment stands at places where play already backs up to combine rather than add to waits and/or more staff training regarding stopping points that minimize backups.
- Restrooms located mid-fairway,

(BRAUER continues on page 55)

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Getting there first

Global Soil Survey for Sustainable Turf guides superintendents to reduce nutrient inputs.

By Guy Cipriano

The routine of a superintendent in a scrutinized part of Massachusetts involves monitoring volatile political situations.

Environmental bills are passed. Measures are enacted. Somebody leaves office and debates involving new initiatives begin.

Matt Crowther, the superintendent at Mink Meadows Golf Club in Martha's Vineyard, understands the political momentum policy makers can generate by limiting the dispersal of nutrients found in products used on golf courses. Whether the initiatives have scientific legitimacy or not, they represent the conundrum of maintaining a golf course in a place where the President often visits.

"It's as much of a feel-good thing as it is the reality of changing anything," Crowther says.

The frequent bickering and enacting has further sparked Crowther's interest in altering cultural practices. Proactive tinkering guided Crowther to the Global Soil Survey for Sustainable Turf. The survey, developed by PACE Turf and Asian Turfgrass Center, is designed to establish reduced nutrient recommendations for golf course turf.

Google Hangout sessions led by Dr. John Kaminski of Penn State directed Crowther to Dr. Larry Stowell, one of PACE's co-founders. Stowell, who has interpreted data with PACE co-founder Dr. Wendy Gelertner and Dr. Micah Woods of the ATC, mentioned the Global Soil Survey during one of the sessions.

"It only made sense to have it done, be part of it, investigate it, try to be in it and be ready for the next phase of regulations

coming our way," Crowther says.

The survey requests three turfgrass samples from good performing areas of the course. Crowther submitted a green, fairway and tee sample. He calls his cultural approaches "fairly organic," but he has been forced to rewrite his annual programs multiple times because of proposed changes in local and state regulations. Crowther has his course's survey results for this year, and he says he will examine them before constructing his 2015 maintenance program.

Mink Meadows features 45 acres of irrigated turf. Only 3 1/2 acres of the golf course are being conventionally maintained with fertilizer and pesticides,

“I feel as a turf manager there is a purpose to all of my applications.”

—Akoni Ganir, Tokatee Golf Club

according to Crowther.

Fertilizer restrictions haven't reached the Oregon woods. But Akoni Ganir, superintendent at Tokatee Golf Club in Blue River, Ore., opted to participate in the survey because of his personal relationship with Woods and respect for PACE's work. "It's a very logical approach," he says.

Ganir has implemented Minimum Levels of Sustainable Nutrition (MLSN) recommendations into Tokatee's 2014 program. Stowell says participants who follow MLSN guidelines are trimming rates of nitrogen, potassium and phosphorus usage without reducing turf quality.

Because he's only in his second year at Tokatee, Ganir says it's difficult to quantify the benefits of reduced nutrient usage. But he's a proponent of the project's principles. "I feel like I'm not applying anything to the grass that's unnecessary," he says. "I feel as a turf manager there is a purpose to all of my applications. I'm not putting 'X' or 'Y' product out there because someone said, 'Try this because this is great.' I know why I am putting everything down and for what reason."

Tokatee, located between Eugene and Bend, experiences four distinct seasons. Ganir has applied MLSN guidelines on Tokatee's greens and some fairway and tee sections. Water usage represents the biggest po-

samples has been established. It costs \$250 to participate in the project, with superintendents receiving a report predicting nutrient volumes to maintain healthy turf.

Goals of the self-funded project include collecting as much data as possible in developing MLSN guidelines and to stimulate discussion about the guidelines and interest in fertilizer management. PACE Turf and ATC manage the project and samples are analyzed by Brookside Laboratories. "It's really a common sense approach," Stowell says. "We are just trying to develop some tools to make it easier for turfgrass managers to make the applications at the right rates they need to make."

Following the guidelines will also help superintendents facing political pressure to change their practices, Stowell says.

"One of the things that inspires innovation – and you see this in the chemical industry – is regulation," he says. "Regulations are starting to require that they make some of these changes. We would of course like to see all of these changes be adopted voluntarily, but it's pretty hard to make changes without some sort of motivation.

"There's always some risk involved when you make some change in your management practice no matter how simple that change may be. There's always a chance something could go wrong. A lot of inspiration for these type of programs and new type of guidelines that are lower allow turf managers to have confidence that if they make these changes, they will have good turf, and make regulatory gains and meet environmental requirements." GCI



Brian Vinchesi, the 2009 EPA WaterSense Irrigation Partner of the Year, is president of Irrigation Consulting Inc., a golf course irrigation design and consulting firm headquartered in Pepperell, Mass., that designs irrigation systems throughout the world. He can be reached at bvinchesi@irrigationconsulting.com or 978/433-8972.

IN HARM'S WAY

Following OSHA guidelines important when work leaves maintenance shop.

I plucked a picture out of my files for my May column to be a kind of fun image showing how crappy irrigation repair work can be and that it would be a better job for someone other than the superintendent or the assistant. The picture generated a comment from one of our GCI readers. Editor Mike Zawacki and publisher Pat Jones love to get comments on the magazine content, but let's face it, irrigation doesn't generate a lot of controversy or deep personal feelings.

Randy Rosenthal, general manager at Hunting Creek Country Club in Prospect, Ky., sent me an email commenting on the picture. Richard, the person in the picture, is not all that tall but it is still a substantial excavation to just change a sprinkler and a swing joint. Randy's comment involved how common it was for golf course maintenance personnel to do repair work like the type shown in the picture under such conditions and do not consider the safety of the hole. He mentioned that his club had in the past been in a similar situation. The maintenance staff was making a repair in a hole, one that was not as deep, but was located along the road. Unfortunately, an OSHA inspector happened to drive down the road, noticed the hole and paid them an unexpected visit. Along with the visit, came an unexpected and hefty fine to the club.

As Randy pointed out to me, heeding OSHA requirements in your

maintenance facility are likely part of you and your club's overall management regime and not an issue, but out on the golf course it is not likely

any, precautions taken.

Because we are talking about PVC, what about the cleaner, primer and solvent cement? When working with

“Because maintenance is not construction, we do not always consider the ramifications of some of the tasks we ask employees to perform.”

on you and your employees' minds. OSHA requirements for construction are not something the average private golf club — nor superintendent — is usually familiar with. For example, there are strict OSHA requirements for the shoring of excavations. These requirements are based on the excavation depth and size. They are in place to protect the safety of workers.

Based on Randy's email, I thought of a number of golf course irrigation issues that come under the OSHA regulations/guidelines that you may or may not have considered. The obvious one is excavations. Another is transite pipe. Transite pipe, which was used in many golf course irrigation systems in the late 1950s and early 1960s, has an asbestos component to it. Exposure to asbestos can cause mesothelioma, a rare form of cancer caused by inhaling or ingesting asbestos fibers. In truth, because transite pipe is a hazardous material, it should only be removed by a licensed remediation contractor. On golf courses, we usually just repair transite like it was PVC with few, if

these solvents, gloves should be worn and there should be proper ventilation. In a deep hole the fumes have nowhere to go and build up.

Your pump station also requires caution. If you have a prefabricated pump station, there are most likely no safety issues as it should have been manufactured with required safety items installed at the factory. If you have an aging system that has had significant maintenance or a built-in place pump system, you want to make sure that rotating parts are covered and electrical equipment is properly grounded. Make sure the wet well is covered — I fell in one once and it is not a lot of fun — and that there is proper ventilation as well as adequate entrance and exit points.

Because maintenance is not construction, we do not always consider the ramifications of some of the tasks we ask employees to perform. Remember that water under pressure — especially high pressure — is a dangerous situation. Always use caution. **GCI**



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BY STEVE TRUSTY

Off to a good start

Aquatrols unveils its new seed enhancement technology that creates a microclimate that nurtures the establishment of each turf seed during its critical formative stage.



Aquatrols International Marketing Manager Tom Malehorn discusses surfactant seed coating with members of the United Kingdom's Sports Turf Research Institute.

The quest to increase the number of viable seedlings produced from each pound of seed sown has led to new technology from Aquatrols Corporation of America. It's being called "Aquatrols Seed Enhancement Technology," and while it has potential for anyone growing anything from seed, it should have a niche with superintendents facing water quality and quantity issues or less than ideal growing conditions.

Germination and emergence are the two most important stages in a plant's life cycle that determine the efficient use of nutrients and water. The first sign of germination is the absorption of lots of water, activating the metabolic functions required for germination and growth. After absorbing water, the embryo grows too large for the seed and bursts the outer shell; a small plant emerges. Several factors impact the availability

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of the right amount and quality of the moisture needed. For example, first and foremost, insufficient rainfall or inadequate irrigation. In addition, water restrictions may be in place, or the quality of the water may not conform to the needs of a particular seed. Likewise, the irrigation system may malfunction, or the soil may be hydrophobic – having a layer that repels water, restricts infiltration and increases runoff and erosion.

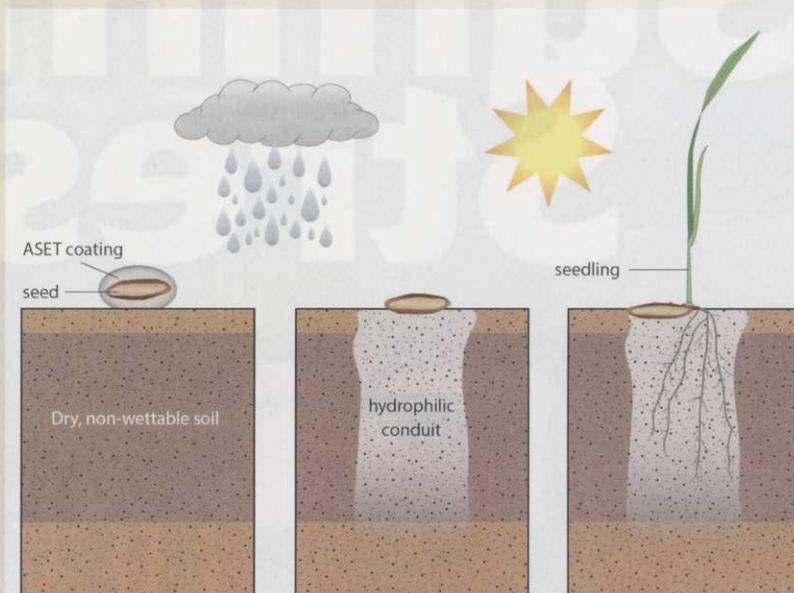
Wetting agents (surfactants) assist in making water more efficient. The seed enhancement technology developed by Aquatrols makes surfactants even more practical to enhancing seed germination and establishment.

THE TECHNOLOGY

It is process that makes the seed the actual carrier for the surfactant. A special coating containing the surfactant is applied over the seed. This allows the surfactant to be right where it is needed and eliminates the need for water to apply the surfactant. This technology enhances germination, emergence and establishment even under water-deficit conditions.

Water is still required to penetrate the coating and initiate the process, but once that water is applied – through rainfall or irrigation – it can be used most efficiently by the emerging seedling. The moisture releases the surfactant in the special coating. The surfactant then creates a protective hydrophilic conduit out and down from the seed. This conduit holds the moisture long enough for the seed to germinate and the seedling to establish. Think of a column down through the soil for the roots to grow into and the leaves to grow out of. Another way to look at it is that a microclimate is created around the seed to enhance germination and establishment.

The technology starts with Utah State University student Matthew Madsen who was focusing on soil science and was looking at the effects of soil water repellence on infiltration, runoff and erosion as related to woody evergreens.



Moisture releases the surfactant in the special coating. The surfactant then creates a protective hydrophilic conduit out and down from the seed. This conduit holds the moisture long enough for the seed to germinate and the seedling to establish.

Madsen went on to Brigham Young University to pursue his Ph.D. and was specifically looking at repellency on revegetation success after wildfires. The technical term is hydrophobic soil. The heat causes a crust to form and water does not effectively penetrate that crust. Federal agencies spend tens of millions of dollars annually on rangeland seeding, especially after fires, with only a 5 percent success rate.

Through his studies Madsen knew there had to be a way to increase that rate. “I was familiar with surfactants and postulated that they might provide an answer,” he says. “I had heard about Aquatrols’ work with surfactants on golf courses and other areas and contacted Dr. Stan Kostka, who is the director of technology and innovation at Aquatrols Corporation of America (ACA) in Paulsboro, N.J.”

They discussed Madsen’s ideas and Kostka forwarded some product to test the hypothesis. The lab trials looked promising. Water infiltrated better in the soils in pots treated with the surfactants. Those soils also held more water and yielded better plant establishment.

Practicality was the next question.

The way surfactants are typically applied requires water as a carrier to allow it to get into the soil. This turned out to not be practical on thousands of acres of rangeland that didn’t have anywhere near the economic value of say, a high-end golf course.

Madsen developed the idea of using the seeds as the carrier for the surfactant. Kostka concurred that the idea had potential and encouraged him to explore the feasibility.

Madsen had some familiarity with seed coating and figured precipitation would release the surfactant right where it was needed allowing it to act as a hydrophilic conduit. The microclimate surrounding the seed would provide greater moisture holding capacity. In one study, the grass cover was 7.5 times greater in the surfactant seed coating (SSC) seeded pot in comparison to the non-coated seed. After additional research to find the appropriate carrier(s), optimum amount of surfactant and other details; and seeing what worked in the greenhouse, they were ready to look at some field trials.

In the meantime, Madsen earned his Ph.D. and took a job as Research Ecolo-

gist at the USDA Agriculture Research Service (ARS) in Burns, Ore. This allowed him to continue his research, especially as it applies to rangeland. While Madsen is concentrating on rangeland, Kostka is developing potential applications for golf courses, sports fields, home lawns or even seeds of agriculturally important crops.

"There are limiting factors on testing this technology on rangeland," Madsen says. "With the rangeland, the usual planting time is the fall and seedlings come up in the spring. It takes a full year to get meaningful results.

"Turfgrass is much easier to research," he adds. "You can test results in as little as five to 10 days."

Seizing the advantage

Aquatrols is working with some of the leading seed companies and commercial availability of seed treated with Aquatrols Seed Enhancement Technology is expected in early 2015. Consider the possibilities for Aquatrols Seed Enhancement Technology in a typical golf course scenarios.

- Quicker, thicker greens establishment? What about fill-in from overseeding
- Spot seeding in trouble areas — along the edges and ends of cart paths, or heavy traffic spots
- Establishing slopes or bunker edges
- Fairway areas where irrigation is limited
- Seeding to establish and maintain grass cover areas in the landscape
- Seed establishment during water restrictions or when budget factors limit water use.
- Seeding hydrophobic soils or areas with high salt buildup, or high salinity in your water source.

This thinking led to a cooperative research and development agreement (CRADA) between USDA's ARS and Aquatrols.

FIELD RESEARCH

Another key individual in the development of this technology was Mica McMillan, Aquatrols' field development manager. She earned a Masters degree in agronomy and soils from Auburn University and is working on her Ph.D. with Dr. John Cisar at the University of Florida. Kostka gave her the green light to work with Madsen to start field trials on what was previously designated as the ASET project, now formally called "Aquatrols Seed Enhancement Technology."

"It was genius on Matt's part to put the surfactant on the seeds," McMillan says. "We usually say 'spray the surfactant on the soil' when we talk to people about seeding. He put the two ideas together."

Based in the Ft. Lauderdale area, McMillan has established both greenhouse and outdoor field trials to test SSC.

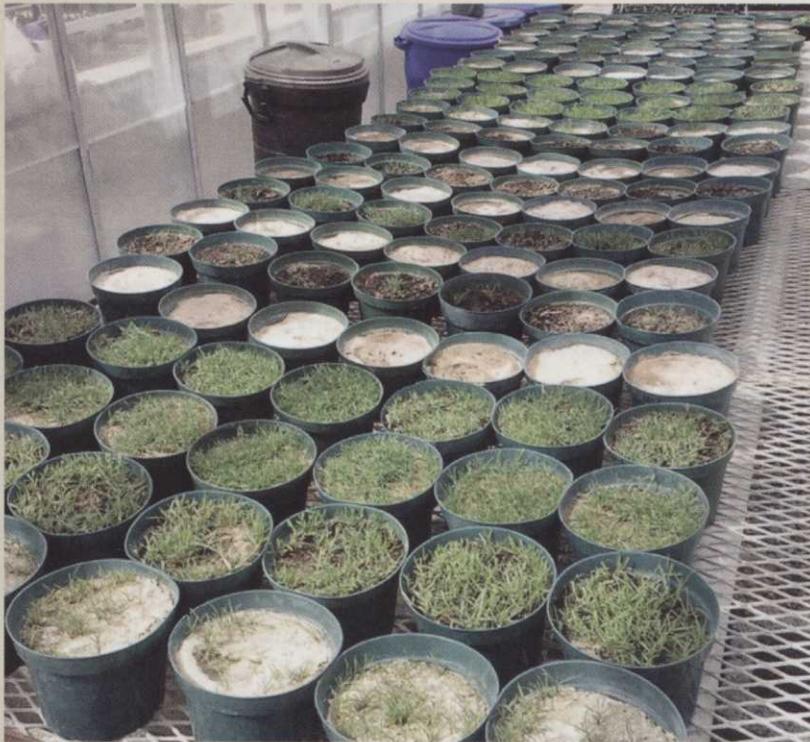
"In the greenhouses, the SSC produced a higher rate of survivability than the uncoated seed," she says. "We are seeing heat tolerance as well as drought tolerance. We are seeing a higher percentage of cover than uncoated seeds in water repellent soils and even in completely hydrophilic sand soils. And, there is better seedling germination, emergence and cover under stressful environmental conditions and no fertility."

McMillan is now exploring how the SSC does in outdoor research. "The field data we are getting from our New Mexico trials looks very promising," she says.

Field trials are also being conducted in



Turfseed featuring Aquatrols' new seed coating technology.



Clockwise from the top: Turfgrass trial cups featuring seashore paspalum. The difference in appearance in uncoated seed (left) and coated seed. Additional turfgrass trials for Aquatrols new seed coating technology.

other areas of the U.S. and in Europe and they will be ongoing. McMillan adds they are researching multiple possibilities to address other agronomic concerns.

KEY MARKETING DECISIONS

The next key person in the equation is Aquatrols Pacific Northwest Territory Manager Dan Macias.

After years working in the grass seed industry, Macias was excited to learn about the seed enhancement project. Likewise, Aquatrols was excited about his seed business experience. Today, Macias is responsible not only for all products in his territory, but also for marketing Aquatrols Seed Enhancement Technology to the world.

The seed industry is always looking for different products to enhance germination, Macias says, and they have found some with limited effect, but this technology is different.

"When seedlings are just getting established, they are very tender and

susceptible to heat and lack of water," he says. "Any way that can help the access to water more quickly, helps substantially in establishment. The idea behind this technology started out looking for a way to enhance post-wildfire renovation. We are just starting to see so many more applications as we perfect the process and explore new things."

Obviously, this technology is going to help establish turfgrass in drought conditions and on hydrophobic soils. According to Macias, numerous other applications could be very beneficial. For example, one situation would be the need to seed a golf course or sports field in non-optimum seeding times. Even if conditions are ideal for seeding, what happens in the event it doesn't rain, or the irrigation system goes down just as the seed is germinating?

If the tender seedling doesn't receive moisture at that critical time, it will not thrive. The Aquatrols Seed Enhancement Technology could provide just what is needed to assure a good stand and quicker

establishment.

As water quality and quantity issues continue to become more of a factor, along with the need to keep dense grassed surfaces filled in, the need for this technology is going to increase.

Cost is always a consideration and there is a cost involved, but some of that is going to be offset with better establishment. And that in turn can cut down on the amount of seed you may need for a given area.

As far as water quality is concerned, Macias says Aquatrols is also researching a coating for seashore paspalum. Its popularity has grown because of its tolerance to high salts once well established. It takes potable, or non-salt water, to get it established.

"Our research indicates that you can establish the coated seed with high salt content water," Macias says. "That greatly expands the potential use of this grass in golf course applications. That research is ongoing." **GCI**

(BRAUER continued on page 44)

rather than after a hole cause backups.

- Circuitous cart and especially walking paths that add unnecessary travel time.
- Individual hole designs can slow play by rejecting golf balls away from greens.
- Most courses have several of these (and other) "slower downers" that add up in a big way.
- Fix the features on your worst bottleneck holes first and you will see results.

And from Bill Yates:

Each course has a pace of play "par rating" consisting of:

- Hole length (longer holes take longer to play).
- Travel length between holes (adds often unconsidered time to any round).
- Hazards/obstacle factor (surprisingly don't contribute as much to extra play-

ing time as you might figure).

Hole sequence matters:

- A par 3 (capacity of two groups) directly after a par 5 with (capacity of four groups) causes delays.
 - Reachable par 5 (and par 4) holes make players wait until the group ahead clears.
 - Lengthening holes ahead of easier holes can smooth flow.
- Course Management:
- Starters need to be pace managers (can't "squeeze in" groups).
 - "Encourage" golfers to play shorter tees, perhaps matching tee set to maximum forced carries.
 - On specific holes, set tees to avoid driving to ponds, through doglegs, etc.

Maintenance:

- Reduce rough height, especially 160 to

220 yards from tees and around greens.

- Reduce green speeds, within smoothness parameters and golfer expectations.
- Balance difficulty of pin locations. (oddly, sometimes easier pins take longer to play, as golfers consider options).
- Align tee markers to help golfers aim (not required by any rule, but good practice).
- Provide ample distance marking (sprinklers alone aren't enough).
- Provide clear way finding signage (you might be surprised on some layouts).

If pace of play is one of our biggest issues, then the design criteria for almost any new course or major renovation should be to design to speed up play. Next month, I will provide some more design tips you might incorporate into your course, either a few at a time, or in a major renovation, if and when that occurs. GCI

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(Photo courtesy of Terry Buchen)

Travels With Terry

Globetrotting consulting agronomist Terry Buchen visits many golf courses annually with his digital camera in hand. He shares helpful ideas relating to maintenance equipment from the golf course superintendents he visits – as well as a few ideas of his own – with timely photos and captions that explore the changing world of golf course management.

GATE VALVE KEY HOLDER

The 2-by-2-inch square-nut irrigation gate valve key used to bounce around in the back of the 2007 John Deere Turf TX Gator 2WD. The roof was removed and the two factory-mounted brackets that held the roof in place on the front hood were modified by adding a U-shaped bracket with holes drilled on either side for a lynch pin to hold it in place. The gate valve key is held firmly in place and it fits perfectly tight. The bracket was made from recycled parts from an old farm harrow/seedier. It took about one hour of labor to modify both brackets. Timothy Brown Cope, superintendent at the Penny Branch Club in Furman, S.C., conceived, designed and built this great idea.



HOMEMADE ROLLER

This homemade roller is used to roll the Bermudagrass greens after aerification so that they are smooth and that no scalping occurs when they are subsequently mowed. The roller was made using mostly recycled parts from discarded equipment. The red-colored 1994 Lely Model 1250 3 point hitch frame was used after the hopper, spin paddles and gear box was removed. The front-end frame from an old Massey Ferguson tractor was used for the horizontal framework. Two-and-half-by-2 1/2-inch square tubing was welded horizontally to the tractor frame and 1/4 inch thick steel plates were welded vertically to the square tubing to mount the roller. Homemade bearing brackets were made to mount the 1990s vintage Verti Drain Fairway Aerifier 6-inch diameter heavy steel roller. Portable tractor weights are added as needed for additional weights. The ratchet strap holds another type tractor weight in place horizontally, as they also can be added as required. The Snapper lawn mower seat was added as a joke because the 18 family owners of the golf course kidded the superintendent that they could sit on the back for extra weight. The roller is mounted to a Massey Ferguson Model 1250 Tractor. It can also be mounted on a Cushman Turf Truckster with a hydraulic dump bed, where the hydraulic cylinder is used where the turnbuckle would normally go and extra pins were added to the roller frame to hookup to the dump bed pin locations. It cost about \$100 for the bearings and homemade bearing brackets and it took about two afternoons to build. Timothy Brown Cope, superintendent at the Penny Branch Club in Furman, S.C., conceived, designed and built this unique idea. GCI



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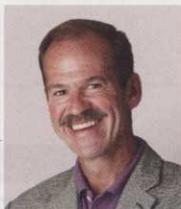
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UNPLUGGED

In the past five years, I got divorced, got sober, got married again, became publisher of *GCI* and *Lawn & Landscape*, wrote a hundred columns, attended 30 or so conferences and trade shows, gave 75 speeches, sent 4,200 tweets, racked up 400,000 air miles, spent 250-plus nights on the road, covered a dozen major championships, turned 50, quit smoking, and even moved a couple of times.

My life has been roaring along like a runaway train...and I absolutely love it. But the one thing I hadn't done in the past half-decade was to get away, and recharge my batteries. The opportunity just never presented itself.

Yes, I am aware that I have an amazing job that routinely sends me to beautiful, fascinating places for free and I've certainly had my share of long weekends, family outings and even an all-too-short honeymoon with the fabulous Mrs. Jones.

But, I never disconnected. My thoughts were never far from the next issue, budget, trip or the next damned 800 words I'd need to extract from my derriere to fill this space. And the loathsome but loved iPhone and iPad were never more than an arm's length away. I was always plugged in.

That changed last month when I headed to the Canadian wild to reconnect with a group of turfheads who love fishing, adventure and unplugging from the world for a week.

The group has changed over the past 20 years, but guys, including Dave Heegard of LebanonTurf, Carlos Stimson of JDL, Fred Anderson of Reinders, Rich Mulder of OHP chemical, Dave Hofacre of Grass Master and Dr. Tom Fermanian formerly of University of Illinois, were along for this year's trip.

The group changes but the destination always remains the same: North Caribou Camp on Cemetery Island, a tiny dot in the middle of the 80,000-square-acre North Caribou Lake. It is, quite simply, an unspoiled wilderness in the middle of nowhere in northern Ontario. It's all tribal land owned by the First Nations (Cree) indigenous people. Only a hardy few of them actually venture to the lake from any of the handful of tiny villages and outposts within a hundred miles. There are no roads, no houses, no power lines, and effectively no way to get to North Caribou other than a small float plane.

That's exactly how we arrived at the lake a few Saturdays ago. The tiny, ancient de Havilland Otter glided in for surprisingly smooth landing on the lake's choppy surface and delivered us at the camp – basically a few simple log cabins and a cookhouse with a dock and six boats – along with 70 pounds per person of food, clothing and fishing equipment. Within an hour, we were geared up and blasting across the big lake in 16-foot Lund boats. We proceeded to fish about 12 hours a day for the next week. It was beyond awesome.

The lake is so isolated it is virtually pristine. It looks largely the same as it did when the glaciers withdrew and the waters filled it in after the last Ice Age. Other than the occasional jet contrail in the sky, no hint that the modern world exists. No trash, no noise and no sign of humans other than a few pictograms left 300 years ago by an artistic native.

It's breathtaking...and it's an adventure. It's hard to get there and it's kind of physically demanding stuff for us old farts. It beats the crap out of you.

The mosquitoes and black flies were indescribably bad. The camp manager told us they were the worst he'd ever seen. It rained, the wind blew hard and we were in little boats on a large body of water with a zillion submerged rocks lurking inches under the water. If something bad happens, you are six hours from a real hospital.

But we didn't give a tinker's damn about that stuff.

I won't bore you with fishing stories other than to say a respected Canadian outdoors writer we met in Thunder Bay told us it's the best walleye and big pike fishery he's ever seen. As Carlos Stimson says: "You don't go to NCL to fish...you go there to catch."

We each caught hundreds of healthy walleye and quite a few big pike. I was lucky enough to get a 40-inch northern into the boat with me and happily release him a minute later. Honestly, it didn't matter how big or how many. It was just a joy to reel them in, give 'em a kiss and send them back home. (Note: Just "air kiss" them. Do not actually kiss a northern pike. You will bleed.)

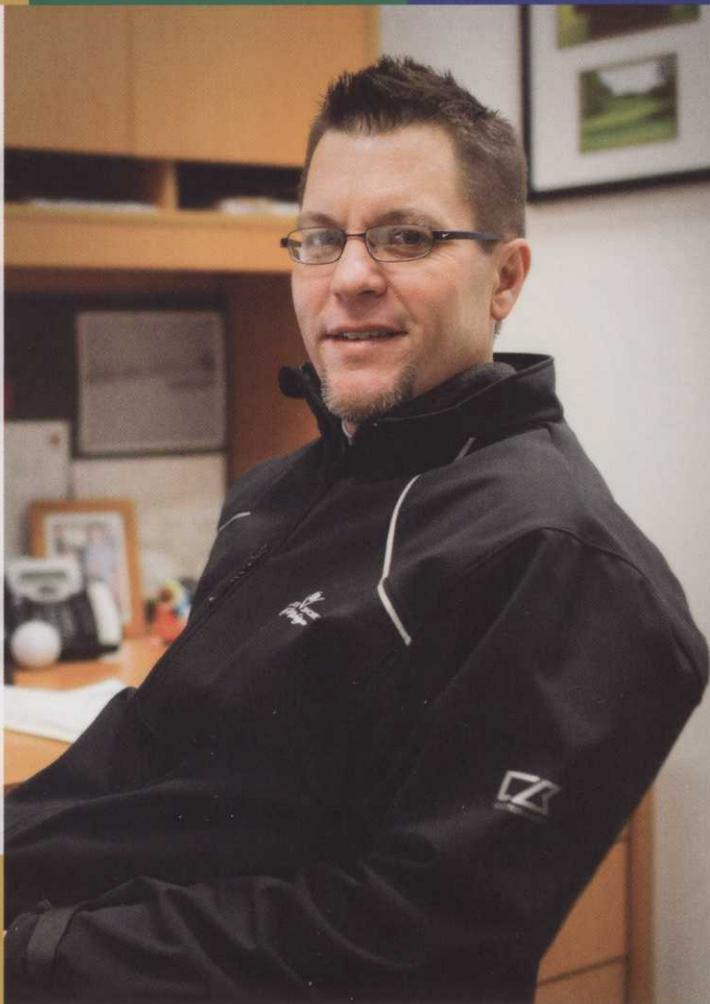
But, the amazing scenery and phenomenal fishing are just part of the story. The real joy of the trip is the sense of place and camaraderie. There is something spiritual about being completely isolated with old pals who share a love for this place. Heegard, my friend for a quarter century, summed it up: "Other people have no idea that a place like this could even exist...and here we are."

But, the greatest thing was feeling the stress ooze out of my body one cast at a time. I unplugged and I am better for it. I urge you to find your North Caribou Lake and do the same. **GCI**

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