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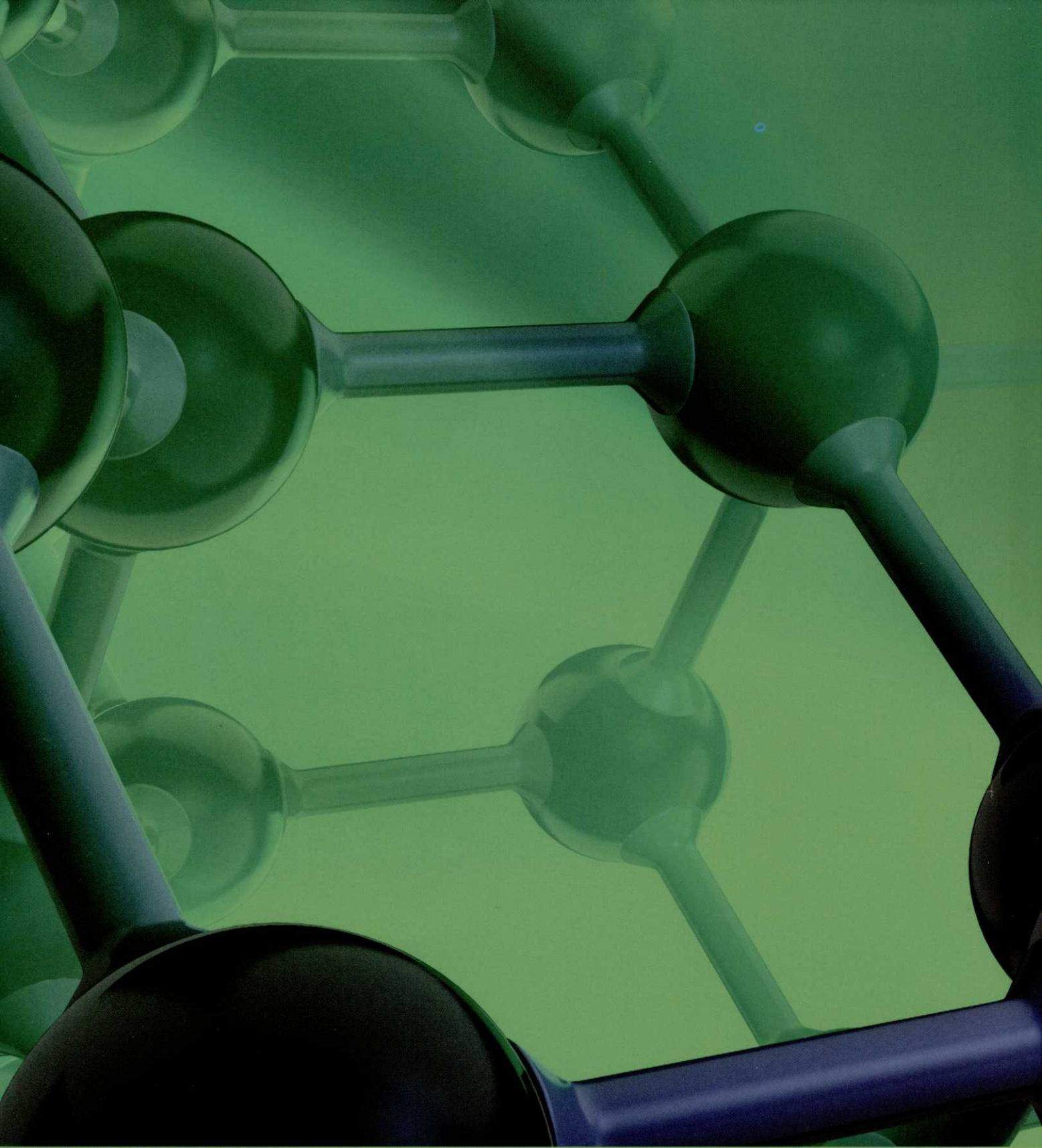
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TM



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SPOOKY

I used to hate Halloween. It always seemed to be a well-intentioned kiddie holiday that had devolved into an excuse for moronic behavior by grownups who believe it's acceptable to drink until they puke on their shoes as long as they have a lame costume on.

In my days as a serious professional drinker, I considered Halloween (and it's equally idiotic cousin, New Years Eve) to be amateur hour. I shunned those holidays in much the same way I avoid air travel during the summer when the entire Clark Griswold clan is almost certain to be in front of me in the TSA line at the airport or clogging the overhead storage bins with lacrosse sticks and skateboards on their way to a Wally World vacation.

(Grumpy Business Traveler Side Note: For the love of god, if you don't travel a lot, try not to be an idiot in the security screening. Your little joke about having a bomb hidden up someplace where the sun don't shine will screw up both of our schedules. Seriously...)

But, I've mellowed a bit with age (and nearly two years of sobriety, thank you very much) and I see Halloween in a new light. I now see it as a warm, wonderful event where

I get to pollute other people's kids with candy, ogle the occasional Naughty Space Girl... and find the premise for a column just as my deadline approaches.

So, here's my Halloween-inspired column idea: Let's look at the spooky season that just concluded and I'll hand out an assortment of tricks, treats and lumps of coal to mark the occasion.

Trick: Mother Nature tricked us into thinking that the Northeast might have a decent golf year when the snow melted early and we had about a day and a half of nice weather in March. That changed pretty dramatically and spring was washed out. The real trick will be for superintendents whose facilities were underwater during some prime playing weeks to avoid budget cuts due to cash-flow shortfalls caused by the weather.

Treat: A giant-sized chocolate bar goes to the United States Golf Association Green Section for continuing to step forward and educate golfers about the realities of weather,

disease and other unavoidable consequences of their demands for fast, firm and perfect conditions. As disappointed as I was to see the old Green Section Record go out of print, the new newsletter version is a fabulous way to distribute ammunition to supers who need a credible, third-party explanation of why the course isn't up to standards. When the folks in the Blue Blazers step up and defend the maintenance staff, it matters.

Lump of Coal: A serious lump of coal goes into the bag of a supplier who would file a questionable defamation lawsuit against a fantastic superintendent and outstanding human being who had just hosted a very successful major championship. Enough said.

Treat: Yay! It stopped raining in the Northeast and we finally got some rounds in and helped the cash flow situation a bit.

Trick: It never rained in Texas.

Lump of Coal: Earthquakes, hurricanes and cicadas in the same week. It was truly biblical.

Treat: Watching China emerge as the global hot spot for golf.

Lump of Coal: To those unscrupulous few involved in the China golf development business who make it a habit of not paying for services provided by the designers, builders and agronomic consultants they have hired. Doing business in the "new China" shouldn't be that scary.

Treat: Basic chemical manufacturers continuing to invest in R&D to prove plant health benefits beyond just pest control (see our cover story).

Trick: Archaic patent laws that only allow original manufacturers a few years to recoup those enormous R&D costs before others can bring similar products to market.

Lump of Coal: Activist groups that will use any tactic – including wheeling children with cancer into public hearings – to cast doubt on the safety of those products.

Trick: Using a weak premise like this to get a column done.

Treat: I worked in a "National Lampoon's Vacation" reference for you. GCI



Pat Jones

Editorial director and publisher

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Correction

In September's "Precision and strategy" the images from another of Frontier Golf's 2011 Builder Awards submissions were erroneously used. GCI regrets this error.

The following are images from Frontier Golf's Legacy Award winning project at Army Navy Country Club, Arlington, Va.



More turf wives

My name is Beth McDonald and I wanted to invite you to visit my Facebook page and blog, Turf Wives, which originated prior to Wives of Turf.

Turfwives Facebook page can be located by following this link (<http://www.facebook.com/?ref=home#!/pages/Turf-Wives/157816847625604>) and Turfwives blog can be located through this link: (<http://turfwives.blogspot.com/2011/08/girls-nights.html>).

In my first blog I discussed what lead to my idea and creation of Turf Wives – to give wives in the turf industry a safe place to share stories, support, advice and love with all the fellow turf wives – and girlfriends and fiancées of course. My page and blog are for all the ladies whose spouses, partners and even boyfriends work in the turf industry: consultants, R&D, developers, pro's, superintendents, assistants, sales reps, etc.

My husband, Steven McDonald, is an independent turfgrass consultant who also has a strong focus on research as well as education. Since I've had the pleasure of meeting such a great deal of his clients, friends and supporters over the past 10 years, I've also had the great honor of meeting most of their wives which brought me to the realization that we're all faced with many of the similar circumstances. My relationship with my husband is very strong and my hope is to encourage my followers to do a few small things during the difficult and challenging times to have similar success as my husband and I have.

Beth McDonald
Spring City, Pa.

To read "Desperate Turfwives" enter <http://tinyurl.com/3bqg6zb> into your Web browser.

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Golfin' on *sunshine*



It looks like the course owners are just trying to provide shade for golfers, but they're really out to catch some rays. The giant panels covering much of the south portion of the parking lot are one of two solar arrays designed to turn sunlight into free energy for Stevinson Ranch in Stevinson, Calif.

"People don't even realize what it is," says George Kelly, course owner. "They think it's just there for shade. But it really has been win-win."

The course started using solar power earlier this year, with a huge investment in the arrays that will eventually pay for themselves in saved energy costs. The setup in the parking lot provides energy to the clubhouse and electric cart storage, while the second installation near the 17th green powers the course's irrigation pump station.

"The key for us was the ability to finance this," says Kelly.

The whole project from installation to transition cost \$960,000. And while a federal grant will rebate about 30 percent of that back to the course, the cost for responsible energy use seems steep.

But Kelly's taking a long view of the cost and the results of a solar-powered golf course.

"This time of year, we saved just in this month about \$12,000 on our energy because of the solar panels, and our payment on them is about \$10,000," he says. "That'll flip when we go into winter for now, but there's a high degree of probability that rates will go up over time. In seven years, when it's paid off, we'll be in a good position."

Though the array is contributing to the course's bottom line, Kelly says its impact is more about showing their commitment to making golf operate greener.

"It really makes a statement for people who drive in here and haven't seen this kind of setup before," says Kelly. "The fact that we've made a major commitment says something about what we're trying to do."

My other car is a golf cart

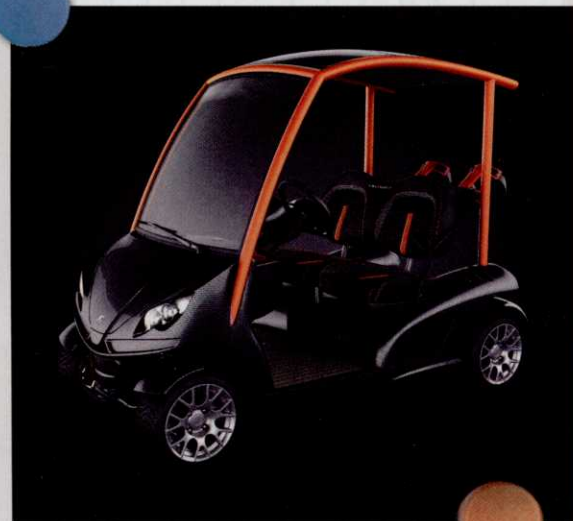
If you're serious about your luxury golf carts, you may want to check out the newly-unveiled Garia Mansory edition, which premiered at the international motor show in Frankfurt this month.

The body of the high-end cart features carbon fiber – usually used in the motor sports and aircraft industries, and teakwood lines the cabin floor. Specially designed headlights, an air scoop and fender gills complete the design.

"When creating the Garia, we set out to build the best golf car in the world, teaming up with the most renowned suppliers in the automobile industry, and with the Garia Mansory Edition our connection to the automobile world is further strengthened," says Anders Lynge, designer of the Garia.

The car comes as a collaboration between Garia and Mansory, which customizes supercars such as the Rolls-Royce, Aston Martin and Bentley, and is available as both street legal and non-street legal.

We at the GCI Intergalactic HQ don't have all that far to travel between offices, but if someone felt like donating, it would make the trip that much nicer.



ROLL CALL

The Everglades Golf Course Superintendents Association (EGCSA) announce that **Wayne Kappauf**, CGCS, Island Country Club, Marco Island, Fla., has received the Florida Golf Course Superintendents Association (FGCSA) Presidents Award for Lifetime Service.

Florida Turfgrass Association Past President **Darren J. Davis** received the group's coveted Wreath of Grass award at the 59th annual FTGA Conference & Show.

PGA Village in Port St. Lucie, Fla., announced the addition of **David Downing** as director of grounds and golf course maintenance, and David Diver, as lead superintendent.

Scott Main has been named superintendent of Kaluhyat and Shendoah Golf Clubs at Turning Stone Resort Casino, Verona, N.Y.

Target Specialty Products announces **Nick Inberg** as its newest account representative serving the professional golf market in Texas.

Trojan Battery Co. appointed **Mat Segal** to senior vice president of global business development.

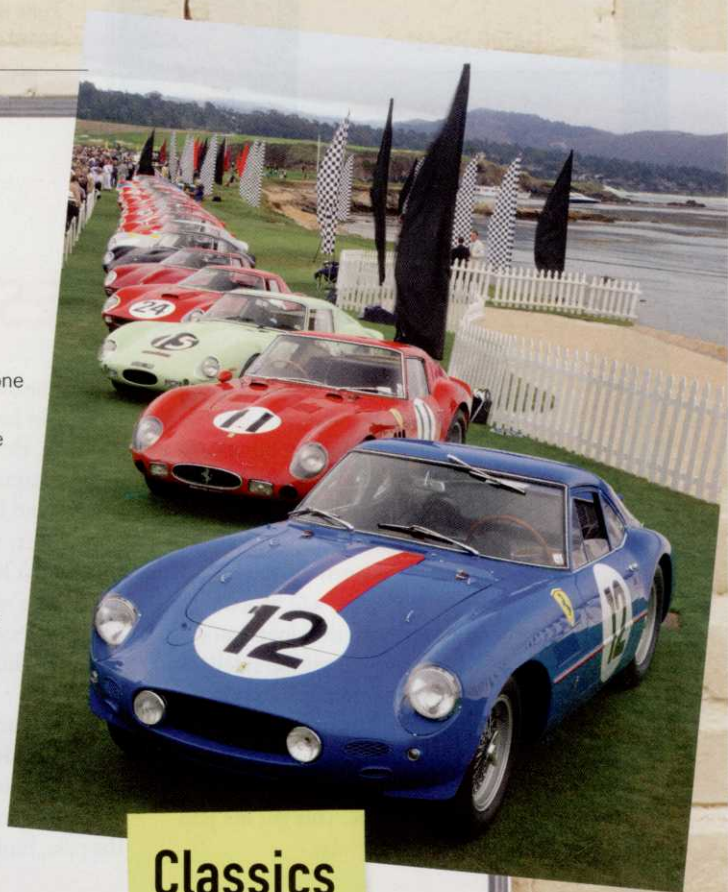
PrimeraTurf elected **Jonathan Annas**, a principal of Green Resource, to a three-year term on its board of directors.

There was plenty of driving going on at Pebble Beach one weekend in August, but it had nothing to do with a tee. More than 200 Duesenbergs, Ferraris, Bentleys and Mercedes came to show off at the annual Concours d'Elegance.

Classic cars and concept vehicles filled several areas of the course, including the 18th fairway and practice putting green. The turf is strictly monitored by Chris Dalhamer and crew to make sure it isn't damaged by an errant tire and play can resume right away.

"In the weeks leading to the Concours, we try to make the fairway as healthy as possible. We then dry down the course to harden the turf so the tires won't sink or damage the grass and create an uneven surface," says Dalhamer. "Once you break the turf layer with a car tire, then there's a problem, so we keep a sturdy grass mat to support vehicles."

Once the turf is handled, the event kicks off to bring in crowds from around the world, including classic car aficionado Jay Leno. Charitable donations raised by the Concours d'Elegance now total more than \$14 million.



Classics on the course

Turf Diseases gets refreshed

Facebook isn't the only superintendent-frequented website that got a recent redesign. Turf Diseases picked up a sleek new look for a blog of sharp insights into current trends in turf research.

The blog's turf pathologist authors have a lot to brag about, with U.S. regions from all over and even international turf issues represented regularly, compiling knowledge and resources for superintendents everywhere.

If you haven't seen Turf Diseases' new look, head to <http://www.turfdiseases.org> and see what's going on with turf all over the world – maybe you'll pick up some new ideas on how to protect your own.





Henry DeLozier, a principal in the Global Golf Advisors consultancy. DeLozier joined Global Golf Advisors in 2008 after nine years as the vice president of golf of 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.

READY FOR THE RESTART

Warren Buffet likes to say the way to become rich is to "Be fearful when others are greedy and greedy when others are fearful." The golf industry hasn't done a very good job of heeding the Oracle of Omaha, but we can do better next time. And there will be a next time. Beaten-down developers and architects will come off the sidelines to build new golf communities and design courses. And prospective club members will again reach for their wallets to join. That's what business cycles are all about. This got me pondering a few questions.

What will it take to dislodge the logjam in course development? Until a large percentage of home buyers can qualify for a mortgage, nothing is going to happen in the housing sector, which means nothing much is going to happen in golf. But whether it's with federal assistance or other programs, mortgage funding will become available, and that's when we'll see things take off again.

Which builders will be first to jump back into community and course development? The big homebuilders. They have access to capital through public equity markets. Plus, that's their core business and they must get back in the game. Companies like Pulte, Lennar, D.R. Horton and Toll Brothers will come back first because they have the most experience building large-scale communities and their business models historically have relied, at least to some extent, on golf.

Are those firms getting ready to build again, even if they don't know when they might get started? Every one of those companies is getting their plans in order. While people are wringing their hands because

they've heard "experts" predict there will never be another home built in America, the shrewd builders are quietly assembling land because they understand business cycles and know opportunity when they see it. They really don't have a choice. If they wait until there is confirmable evidence of a recovery, they'll be eight to 14 months behind the market cycle.

What important lessons did the economic downturn teach developers? For starters, there's no room for ambiguity and design-on-the-fly. In the past, builders could dismiss creep-

standpoints. Courses will start to look more traditional with routing following the site's natural terrain. As a consequence, there will be less bulk grading – a source of major construction costs. Designs will be refined to reduce on-going operational expenses such as irrigation and drainage costs. The number and contours of bunkers will be reevaluated, which will impact strategy. Overall, designs will emphasize time efficiency and enjoyment.

Does that mean we won't see any new 7,600-yard courses? I don't know how long the courses of the

Be prepared for the market to restart. Many savvy investor groups **have begun acquiring land** for the next development cycle.

ing development costs in large-club projects simply by increasing the cost of the lot by \$1,200 or so. Now an increase of \$1,200 is the difference between whether someone can afford that lot and the house scheduled to go on it. There was so much elasticity in the recent market cycle that planners and developers could indulge in a certain amount of inefficiency. That elasticity is gone, which puts the priority on cost-containment. If the prevailing attitude was once to err on the side of throwing money at a problem, now the default will be the most cost-effective solution.

How will course design change going forward? Golf will not be the driving amenity in all communities, as it has been for so long. We'll see sports and fitness and golf membership being equally desirable to many homeowners. The courses built will be more affordable from a construction and ongoing maintenance

future will be, but women will apply a fresh dose of long-needed reason to the design process. Developers are beginning to understand that women make buying decisions. Developers need to ascertain what women want from a community and club experience. They may want to be part of a golf community because it's important to their husbands. But golf is not as important to her as her family's well-being, safety, schools, health and fitness. Those things trump a great golf course in her book most every time.

What do we do next? Be prepared for the market to restart. Savvy investor groups have begun acquiring land for the next development cycle. Align your project planning to proven and measurable markets; measure the location and proportion of your target market segments. Maximize efficiencies by calling on experienced golf community and course experts; place substance ahead of marketing pizzazz. **GCI**



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By Kyle Brown
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SUPER SOLUTIONS

New **“plant health”**
benefits are popping up
on more product labels

GCI finds the
**NEW
FORMULA**
behind the
trend



Fungicides with additional plant health benefits promise to not only help handle invading fungi, but promote an environment that encourages more resilient plants and better root growth.



Jim Myers has been waging a hard-fought war on anthracnose.

As superintendent of The Plateau Club in Seattle, Myers says

anthracnose is the most persistent and serious summer pathogens many courses in the Pacific Northwest face in a season.

"We see anthracnose all season long, that and pink [snow mold]... and we're over 60 inches of rain so far for the season, so you can imagine the disease pressure," he says. "We spend well over \$50,000 on fungicides annually. True, that's not as bad as the Midwest guys fighting pythium, but it's a pretty good chunk of change for us guys in the Northwest."

This past season, though, Myers had a new weapon in his arsenal; a super serum, so to speak, that treated the anthracnose and boosted turf health. Early on, Syngenta asked Myers to do some protocol work at The Plateau Club on its recently released Daconil Action fungicide product. In addition to the fungicide chlorothalonil, the chemistry contains acibenzolar, a purported plant health booster. Myers split a fairway and a green and treated half with the Daconil Action. After six applications every 14 days the turf on the treated side was noticeably more disease-resistant.

"There certainly was a notable difference," he says. "The turf on the treated side seemed healthier."

Many new fungicide products and formulation have entered the turf market recently that claim secondary "plant health benefits." While most suppliers define these benefits differently, in a broad sense these products have an added punch that treats the problem and boosts

the turf's well being.

Are these products all they claim to be? GCI looks at the secret identities of a few of these super serums so you can come to your own conclusions.

STRESS BUSTER. Syngenta isn't the only supplier with a new plant health booster in the fungicide market. BASF's Intrinsic fungicide turf products – Insignia and Honor – contains the strobilurin pyraclostrobin. BASF research has found secondary plant health benefits to turf – a sort of stress buster – in addition to its primary use as a pathogen control, which the company has begun to market this season.

"We position Intrinsic as a disease-control product first and we don't stray from that," says Kyle Miller, BASF senior technical specialist, turf and ornamental products. "However, we do see an ability to protect against stress – cold and hot, wet or dry and mechanical – which can really help the turf."

In addition to fighting disease pressure, Miller explains BASF's research has seen pyraclostrobin contribute to improved turf root systems during times of stress. "If the turf is in perfect health, we don't see a significant difference between our turf and someone else's turf that was treated with another product," he says. "What we are seeing is that when stress is imposed on the turf, this benefit kicks in."

Miller equates that benefit to receiving a vaccination. "Everyone's healthy until the flu hits," he says. "I've got the vaccination and you don't, therefore I'm protected. That's a little bit of what's going on here."

As a result, BASF has positioned the plant health benefits of the Intrinsic

products for the times when superintendents know their turf is going to be under extreme stress. For example, around the Fourth of July when Mother Nature historically turns up the heat in the Midwest, or in preparation for tournament play.

"Our positioning is, here are the times when, traditionally, your turf is under the most stress," Miller says. "Why don't you slot it into your rotation during those periods of time – like before a big tournament when you've lowered your mowing height and you know your greens are going to get extra play. Your turf is going to get stressed... there's no two ways about it. Therefore, you want to time your applications around this."

Miller warns, though, there is a danger overuse could lead to a resistance effect, and it's an issue they address with superintendents when they talk about the product's benefits. "Our stance is no more than two applications back to back," he says. "That comes from the Fungicide Action Committee (FAC) guidelines for the use of strobilurins. We've had one of our university colleagues jump up and say that by using this product for plant health people will begin to use it more and even may overuse it. Our position on how we want people to use it hasn't changed."

"When you look at the economics of these products, they're on the high end because they're broad-spectrum products," Miller adds. "Unless you have a blank check, you can't afford to overuse these products."

PROTEIN POWER. While they both promote plant health as a secondary benefit, both BASF and Syngenta go about it in two very different ways. BASF's Intrinsic products'

added turf health benefits are based solely on those provided by the fungicide, pyraclostrobin.

Syngenta's fungicide, Daconil, doesn't provide any benefits to the turf beyond its properties as a contact fungicide. It's the addition of acibenzolar that kick-starts protein production inside turf. "The plant basically produces the proteins that build up resistance to multiple diseases responsible for defense mechanisms," says Bob Goglia, Syngenta brand manager. "The acibenzolar builds up these proteins without the plant having

to be sick or stressed to do it. Then you have a healthy plant that has never been injured that is able to ward off diseases and stress."

Overuse and resistance effects are not issues with Daconil Action, Goglia says, because acibenzolar services as the plant health booster. Goglia stresses that Syngenta's product isn't a one-application silver bullet. Rather, it's a preventative approach that takes time to realize the plant health benefits.

Myer can attest to this fact. During his fairway test at The

Plateau Club, Myer witnessed outbreaks of necrotic ring spot develop on both the treated and untreated sides. "On the right side – the untreated side – the necrotic ring spot was worse than it was on the left side, which was treated," he says. "Necrotic ring spot was not listed on the Dac Action label. So I was able to see some definite improvements with the necrotic ring spot on the left side compared to the right side, which I can attribute to the protein boosters that help the turf get some control against

the necrotic ring spot."

CONTINUED GROWTH. Of course, mixing fungicides with plant health products is not an entirely new trend. Several Bayer CropScience fungicides, like Triton and Reserve, have carried the company's StressGard Formulation Technology since it was introduced in 1994.

"It was the discovery that we had with our first product that we brought to the market which was Signature, which was used for the prevention of pythium," says Jimmy Johnson, Bayer's fungicide business manager, market manager for golf. "We discovered that probably the larger benefit the plant was getting was from the standpoint for summer stress. We had an effect on anthracnose, but the active ingredient itself doesn't actually control for anthracnose.

"From there, we started taking this formulation technology and screening other active ingredients to see if we got similar results. Not necessarily doing the same thing, but affecting the plant as it relates to turf density, quality and being able to handle different stresses."

The products have the most benefit when summer stress is already coming up. A fungicide like Reserve, with DMI and chlorothalonil, can sound like a bit of a long shot in the heat of the summer since the mixed chemicals could have a PGR and thinning effect on turfgrasses. However, the addition of StressGard helps protect against those effects, says Johnson, where similarly formulated products can leave turf dazed while the fungicide combats disease.

"We look at it as going beyond traditional and classical plant protection," says Johnson. "We're evaluating it from the plant physiology structure and

PLANT HEALTH BENEFITS WORTH IT FOR TURF?

Though mixing fungicides and added plant health benefits is a growing trend for suppliers, not every

supplier is getting behind it. Adding to overall plant health is a bonus, says Mike Riffle, manager of research and development at Valent, but if the turf is well-cared-for, it's already going to be healthy.

"If you're out there controlling the diseases in your turf, the turf quality is high already without considering any kinds of turf health benefits," says Riffle. "If you have a really good fungicide program, you've got good turf quality. If you don't control the diseases, you're not going to mask that with any other additives. You don't even have a job if you can't control the diseases."

But it's not that the additives are acting as a mask at all for the fungicides. It's more about being able to say with certainty what the additive is doing, and what the plant can handle on its own, says Jim Goodrich, product sales specialist for professional turf and ornamental products for PBI/Gordon.

"I think more needs to be put into it scientifically as to university research to determine what's being done that the plant's not already doing itself," he says. "I think it's a really positive benefit for supers if in fact through replicated studies we can find out what the ingredients are doing."

University studies are helpful, says Riffle, but not the final word when it comes to proving the real usefulness of these products.

"The turf health goes hand-in-hand with controlling the pests and diseases in that crop," he says. "If they're controlling the diseases in the plot they're testing, the turf quality is going to be excellent and anything else you add in there is going to be really difficult to determine exactly what

it's doing."

Not only should the benefit be consistent, it should be a clear, visible difference in the turf, says Riffle.

"You have to be able to go out to the research plots and be able to say, 'That plot clearly has the advantage over the one next to it,'" says Riffle. "At least the way I see these technologies right now, it's what I'll call a marginal increase in turf quality. I'm not being disparaging at all in what they're trying to do. I just don't know that the technology is advanced enough that we can see a clear difference in turf quality."

Superintendents are looking for more visible results and effects they can see clearly in action on the course, says Goodrich.

"The thing about the industry of golf course superintendents is that everyone is well-educated," he says. "These guys rely on companies to give them valid information they can use themselves. We're seeing more and more of the superintendent saying 'Show what this has done,' for these products."

As budgets tighten, the superintendent is pickier about taking chances with a product, says Riffle.

"It depends on what it costs and if they see a clear benefit to their turf," he says. "The superintendent is not going to read some flyer and say this may help your turf. They'll try it, look and evaluate. They have to be able to see the value of what they're spending their dollar on. If they find something that's striking, the industry will take notice."

Superintendents
should test
fungicides to find a
program that suits
the course.



processes and how different inputs and materials affect those plant structures, not just the control of a disease.”

As opposed to just using fungicides to make healthy plants, using the combination fungicides and plant health products can help build the ability of the plant to fight off disease in the first place, he says. As restrictions and budgets get tougher, they could help supers do more protection with less product.

“It’s going beyond just your standard controlling dollar spot, brown patch, things that we already expect the fungicides to do,” says Johnson. “If you minimize the stresses, that in itself is going to have a reduction of disease pressure. We’re taking a really in-depth look at managing water, plant nutrients, the fungicides and insecticides themselves, as regulations are having more impact in some areas in the tools that they can use. It’s one thing to take these products and just ‘add this too’ and spend more. What we’re talking about is spending less or changing your input and relying on other technology to actually make up for that or even do more and better.”

Though the mixed fungicides themselves could cause resistance over time, the inclusion of the StressGard technology in several products is meant to help supers keep turf protected throughout the season, he says.

“These are fungicide-based products and we are definitely

a proponent of rotating fungicides,” says Johnson. “This allows the super to choose the products they need to take care of the disease

aspect and rotate those products to make sure they don’t have resistance concerns and at the same time continue to protect the plant from heat and cold stress and things like that.”

A GREEN FUTURE. And not all added plant health benefits come by means of a chemical additive – SipcamAdvan is pushing for a bio-heavy approach with products like Echo Ultimate ETQ, which includes a pigment meant to protect turf from the effects of UV sunlight. It shades the turf like sunblock, which helps below the surface, says George Furrer, the company’s director of specialty business.

“We have a product that’s got fungicide plus some pigment technology that reduces the effect of UV sunlight,” says Furrer. “When you look at university trials side by side, the whole difference there is plant health. Disease control is the same from one to the next, but the overall turf health is much greater in the product with the plant health benefits. They’re finding out that plant health and root health have an awful lot to do with what you’re seeing on top at the putting surface.”

But the pigment isn’t a change to the fungicide itself, just an addition to products that already work, as suppliers try to make life easier through each new mixture, says Furrer.

“We have our fungicide with chlorothalonil that’s about 50

years old that is basically the fungicide used today,” he says. “I think it’s absolutely a defining strategy for companies like us. There aren’t any more home runs to be discovered or developed in terms of straight fungicides. What this has done is forced everyone to look for ways to make that standard control better or unique.”

But while the price for products with plant health benefits is usually higher, it could make turf care cost less overall while providing more solid coverage, especially as suppliers find more ways to focus their fungicides.

“We’re at the point now

where the paradigm for suppliers or developers of products has changed,” says Furrer. “Every super, I don’t care whether he’s at a top course, has to find a way to do more with less. Application costs are all greater than usual, and budgets to manage that same amount of turf is flat or down from three or four years ago.

“They’ll be able to eliminate some of those things they’re using today just for plant health benefits. And with the added benefits, you can maybe use less. If you can condense for applications into three, that’s huge for a golf course super.” GCI

THE SCIENCE OF BOOSTING PLANT HEALTH

Dr. Tom Hsiang, turfgrass pathologist and professor of environmental sciences at the University of Guelph

What are fungicides with plant health benefits supposed to do for turf? They enhance the natural resistances of the plant to respond to attacks. In some cases, they may work in the sense of fending off the attacker. It means there’s a chemical that causes the plant to produce resistance compounds that are going to make the plant better able to handle an attack. We might use the term, “resistance activators.”

Is there any significance to when the fungicide is applied? Well, if the plant is already under stress or weakened because of normal use conditions, and you give it more of a chemical that causes it to produce more resistance compounds, you are redirecting some of its normal energy to resistance chemical production, which might make it less likely to survive. Let’s use this analogy: humans, we have drugs to stay healthy. But if somebody’s very sick and you start giving them very potent drugs, those things may make them even worse and may actually end up hastening their death.

I think it’s the timing issue. If something’s under a lot of stress, you don’t put it under more stress. Probably before that would be a good time to get their defenses built up. But it’s not like once they produce it, it lasts throughout the growing season. The product produces certain compounds that allow it to fight off infection more, chemicals that fight off other invaders like fungi.

Will more fungicides continue in this trend? I think it’s going to come that way. The societal trend is toward decreased fungicide use in the cities and much more restricted usage. This wave is not something that can be fended off or pushed back, regardless of the science behind it. I think they’ll continue to use them as they’re promoted as environmentally friendly.

The governments have accepted the data that they’re not considered hazardous to humans. I’m not distrustful of them at all, but companies always promote the benefits of things and may not mention all the downsides that have been observed in research.



Dennis Lyon, CGCS, is a GCSAA past president. He spent more than 35 years as the golf division manager in Aurora, Colo., and is the 2011 recipient of the USGA Green Section Award. Dennis can be reached at dlyon@gie.net.

THE BLACK SWANS HAVE LANDED

This article has nothing to do with the movie "Black Swan." It does, however, have everything to do with the highly improbable and how the business of golf has changed.

The black swan was considered a myth until they were discovered in Western Australia in the late 1700s. The black swan discovery is an example of how our reliance on experience and past observations can limit our ability to understand the present and accurately predict the future.

Lurking in the shadows of the past and the future is another kind of black swan – not a bird but an event. Nassim Taleb wrote the bestselling book "The Black Swan: The Impact of the Highly Improbable." Taleb's black swan has three distinct elements.

First, a black-swan event lies outside the realm of predictability; second, it carries an extreme impact; and finally, despite the fact the event is an outlier, human nature causes us to concoct explanations for its occurrence after the fact. Catastrophic events are examples of black-swan events. The stock market crash of 1929 and the invention of the Internet would also qualify as black-swan events.

At the end of the 20th century, golf was coming 30 years of unprecedented growth. Think back to the challenges the industry has experienced in the last decade, with its dramatic decrease in players and precipitous drop in revenue.

The pundits all said: There are too many courses. Golf costs too much. The game takes too much time. Golf is too hard. The rules are outdated. Baby Boomers can't afford golf. Two-income families don't have time for golf. Kids don't have an interest in the game. These are elements of the issue, but their sum does not add up to the dramatic change we experienced.

During the last decade – as rounds

and revenue either dropped or plummeted – everyone scrambled for solutions. Many thought discounting was the answer, except it wasn't. Internet tee times were the answer, except that scheme made money for someone else. Club initiation fees were too high; many were lowered with few takers, and so on. These are elements of the issue, but their sum does not add up to the dramatic change we experienced.

Two recent black swan events significantly impacted golf. The first is 9/11 – which had a profound effect on our society. The other is the 2008 financial collapse, which caused the "Great Recession" and placed 15 million Americans out of work.

Are you still hoping things will somehow get better by applying Band-Aids to an organizational hemorrhage?

Today's reality is, in many cases, there are simply not enough golfers and enough cash coming through the front gate to ensure the front door can, in the long term, remain unlocked.

Now step back from your cash register or your irrigation computer or your mahogany desk and take a hard look at your golf operation. Are you trying to mitigate the impacts of two black swan events without fully understanding them for what they were – unpredictable events, with extreme consequences beyond your control? Are you still hoping things will somehow get better by applying Band-Aids to an organizational hemorrhage?

As a golf operator, the causes and impacts of 9/11 and the 2008 financial crises were not your fault. There is no silver bullet to bring back the 1970s, 80s and 90s. There is no turning back

the clock. Blame the black swans, not yourself. The world of golf has changed, probably forever.

How then do we approach the future? Don't look only to the past to project the future. We are in a post-black-swan era. Here's my advice:

Strategic planning. Challenge your team to create and implement new and more-efficient ways of doing business. Educate and include all stakeholders in the strategic-planning process.

Revenue expectations. While it is necessary, noble and worthwhile to be creative in figuring out ways to increase revenue, in most cases the increases will not be significant. Face the fact, the cash coming in today

will not be returning to former levels anytime soon.

Evaluate expenses. Take a hard – and likely painful – look at your operation's expense side. If your facility can't solve the financial problems with revenue increases, cutting expenses is likely your only alternative. In my view, entrenched standard-operating procedures probably need to go. Re-evaluate your operation literally from the ground up. If financial issues are severe enough, make proactive budget reductions to include areas previously considered untouchable.

Golf must rise to the occasion and acknowledge the ways of yesterday are over. To survive and prosper in this new era we must be on the leading edge of change.

It really is a new day for our industry. Adapt now and don't let the black swans win. **GCI**



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**Without a doubt,
it's going to
happen someday.**

**GCI's Bruce
Williams tells you
how to prepare
for your last day
on the job.**



Pink slip blues

by Bruce R. Williams, CGCS

Like death and taxes, every golf course superintendent will ultimately face that inevitable last day on the job. Some may work 40 years for the same employer while others may be moving on for better opportunities. Sadly, some are either terminated or pushed out the door. Each situation, though, brings a specific set of circumstances. I'll share several universal items that will help anyone prepare for their last day on the job.

Have a plan

People spend a lot of time planning on how to get a job. We also spend a lot of time doing our job. Rarely, though, do we develop an exit plan. This plan may be for retirement or it may be for something that comes unexpected. Nonetheless, I encourage everyone in our industry to take some time to prepare for your last weeks and days on the job.

Passing the baton

Many years of blood, sweat and tears are put into golf courses under the management of golf course superintendents. Agronomic plans and long-range improvement plans are a part of a process that can take five to 10 years to complete. Typically, most of these plans are recorded and should be made available to the new superintendent coming on board. Be sure to make these records available and keep them in an organized fashion. After all, they are the plans you likely developed. While your time at the helm is over, it is time to pass them along to those on the next watch.

Any and all records may be copied by the out-going superintendent for his or her personal use. Fertility programs, integrated pest management programs, better management plans, photos and such should all be kept in duplicate. I always recommend doing that just in case computers crash, so it should not be a problem to keep that info on a personal hard drive that is the property of the golf course superintendent.

Communicating the message

Many businesses today have a specific protocol for departing

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employees. It is not uncommon to stop any use of the computer server and email service. It is a good idea to have a separate email account for personal use. Any items you might need later should be kept in that account even if they are duplicates. Once you lose access to company computers you'll also more than likely lose access to your MS Outlook database – or similar programs – that keep you in touch with your networks.

Imagine losing your cell phone in today's connected world. It creates a nightmare for anyone. I suggest having your phone contacts backed up and it never hurts to ask the employer if you can keep the phone and take over the billing.

Making a statement

When a superintendent retires there may be consideration for a continued relationship with the golf facility. This may range from an honorary membership, club usage with discretion or even consulting at the facility.

It is best for a golf facility to write a nice farewell message showing appreciation for a retiring superintendent. Whatever the agreement, it is best to share it with the golfers and/or members at the facility.

However, in some situations it may not be a welcome departure, but it can still be done with class. I suggest that golf facilities work with the departing superintendent to have a

mutually agreed upon statement that both parties can use jointly.

Getting around town

While the title to the car or truck they have been provided with is one of the nicest things a departing superintendent can receive at the conclusion of their tenure, this does not always happen. Recent Golf Course Superintendents Association of America (GCSAA) research shows that about 77 percent of its members receive a car allowance or vehicle as a part of their job. Being on call 24 hours a day, those vehicles are often used as the superintendent's main transportation.

Upon retirement or employment separation you will need to make arrangements for the future or negotiate an agreement with the employer to either be gifted the vehicle or to purchase it. Either way there will be tax liabilities that few consider because they don't have a plan in place for their exit strategy.

State of the state

Each state has a different set of laws regarding employment. Be familiar with your specific laws. Some states require that unused sick or vacation pay be paid out to departing employees. The same may be true for compensatory time for holidays worked and such.

Cardboard box rule

Most employment terminations result in a quick exit from your office and the property. This is just the standard business procedure today, and while it seems harsh, it is a reality. I often hear of people having 15 to 20 minutes to gather their personal belongings and place them in a cardboard box before leaving the property. Take a minute and think about what you might be able to fit in a cardboard box after working out of the same office for a decade.

Be sure you know what belongs to you and what belongs to the golf facility. Books purchased by the golf course during your tenure should stay with the golf course. The same is true with digital cameras that the course may have purchased for your use. Laptop computers fall under the same category.

COBRA

While human resource laws and policies vary by state and employer, many offer departing employees a COBRA option for their health insurance. Those retiring who are eligible for Medicare will have no problem. Many will need continued health and dental care



Conducting your own JOB SEARCH

For those that are unemployed it is now time to get busy in finding that next job if so desired. There are so many vehicles to assist with this today. I strongly suggest that people utilize the GCSAA Career Development department and look at the website. There are many good tools there that can help superintendents looking for a job.

If you haven't done it for your entire career then no better time to develop and strengthen your network. One person can only do so much in finding a job but with a strong network assisting you many hands make light work. Others can assist you in finding job opportunities that are out there. Use the GCSAA ERS, TurfNet, Indeed.com and other vehicles to see what is available. Have your resumé fine-tuned and ready to go. Develop a personal website or blog to showcase the many successes you have had during your career.

And since you never know when that last day might come it is best to have a resumé that is current.

You never know when you may have to move into the job-search mode. First thing that comes to mind is knowing what your employment options are. Be sure to develop a set of skills that not only required for golf course operations but also transferable to other employment opportunities. Many superintendents have found successful transitions to a variety of careers with the skills learned while managing people and resources in the golf course industry.

In some situations it may not be a welcome departure, but it can still be done with class.”

coverage as a bridge until they are on a new plan. Take the time to look at what those options are before you are under stress and have to make quick decisions. Most employers' human resources departments can provide you with this info, and it is good to evaluate your options every few years.

Know your legal rights

I cannot offer any legal advice, but I can make a few suggestions for readers to follow up on. Most separations are amicable and will not require any legal assistance. However, there are instances in which some employees believe they have been wrongfully terminated. If this is the case in your situation, then you will want to consult with a labor attorney who specializes in this area of law. Be sure to supply them with the facts and, most importantly, have documentation to back up your assertions.

A couple of items to keep current are your employee reviews and any other pertinent information that will help you negotiate a fair severance.

Finishing strong

When leaving a golf course you never want to rest on their many years of hard work. Golf courses require a lot of TLC, so do the best you can right up until your last day on the job. Some golf courses merely say they choose to go a different direction and may give an individual several months notice to provide them with ample time to find new employment. Finishing strong bodes well for you and often includes a great reference from facility ownership or management.

Transitioning

In some cases the departing superintendent will be asked to assist in selecting the person that will follow as superintendent. If this is the case work hard to develop a plan for the employer. Possibly the departing superintendent has prepared a potential candidate or two on the existing staff. I do believe we owe that to our employers.

Personal finances

When individuals find themselves on a fixed income it creates a lifestyle change. Again, whether through retirement, layoff, separation or termination, it is essential all superintendents do a gut check on finances throughout their career. Do you have enough money, in savings, to go without a paycheck for six months? Do you know how much Social Security you will receive? Do you know how money in your IRA could or would be distributed? All of these are very important questions that will need to be answered.

A wise investment is to retain a financial planner who can help you answer these questions and provide a “game plan” for managing your finances that will protect you and your family.

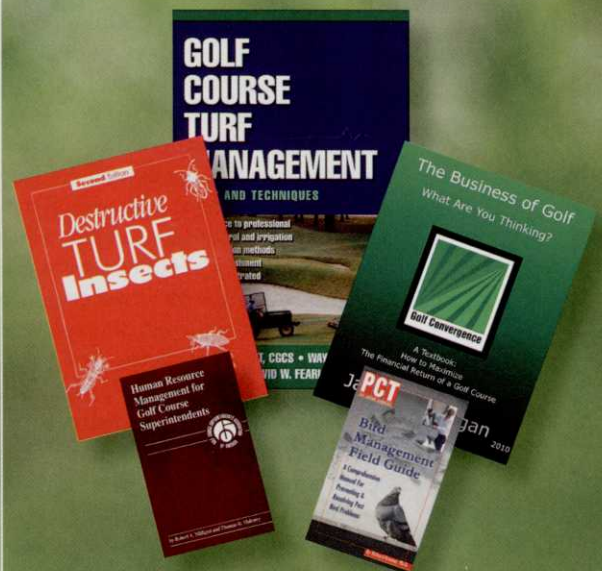
Overall, be prepared for that last day or week on the job.

It may be three to four years off for a scheduled retirement date, or it could be as close as a few weeks when new owners take over, a new green chairman wants to go a different direction or it's just a bad weather year.

Superintendents are great planners and an exit strategy should be no different than any other. It should be well thought out and done in advance while providing a variety of options for a departing golf course superintendent. GCI

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PHIL'S FODDER

Column deadline day and what to write? Wait, thank you Phil Mickelson for part two of your "Rees's Rants"; this time for changes at Chicago public golf icon, Cog Hill, made in hopes of landing the Second City their People's U.S. Open. The comments are also a proxy for complaints on modern architecture in general, which have some merit as we discussed last month.

A course designed to hold major tournaments is likely a wee bit tough on Joe Six Pack the other 519 weeks a decade. A few common design elements cause unnecessary difficulty for everyday players. While well known, some course designs use them, and problems ensue.

TEE SHOTS. A decade-old USGA study showed more than 20 percent of tee shots are dribbled, skunked, shanked or squibbed fewer than 100 yards. Keeping turf from the middle tees to fairway is essential to fast and fun golf. USGA studies also show fairways must be at least 40 yards wide for 66 percent of tee shots to find them. My research shows it takes a play corridor of at least 75 yards wide to provide "safe landings" for about 80 percent of tee shots. On a typical narrow tree-lined course, with native grasses in front of the tee, almost half of tee shots may be lost, or at least looked for.

Let's go back to mowing turf and cutting trees, and environmentalists be damned.

Phil mentioned, "Slashing out of the rough" being hard on average players. It should be kept just long enough to create visual difference between fairway and rough, but some tournament venues do keep rough high to give their players that PGA Tour or US Open experience.

APPROACH SHOTS. USGA research shows average golfers spray their approach shots in a width pattern of about 15 percent of the approach shot length. That's 24 yards wide for a 160-yard approach shot. If you let your greens shrink, widening them back out just three feet all the way around a 5,000-square-foot round green, you will pick up almost 800 square feet of green – a 15 percent gain and greater chance your golfers will "reach the dance floor."

THE FRONTAL APPROACH. Phil complained about this the most, even though his idea of a roll-up approach

is using the drive through at Krispy Kreme. While strategic design for good players would suggest an approach slightly narrower than green width, average golfers still bounce the ball well in front of the green, and need an open fairway approach in front that is nearly as wide as the green. The benefits to average players outweigh the strategic needs of good players by tenfold in this case.

AROUND THE GREEN. The USGA is mum on how wide an area is required for all golf shots, but I suspect it's embarrassingly comparable to the width of Kansas, especially in typical Kansas winds. But, my research shows that about 80 percent of golfers stay within 25 percent of the approach shot length (40 yards wide on that 160 yard approach) and 99 percent will stay within 40 percent (or 64 yards wide).

Removing trees, deep rough or native areas close to your greens in favor of expanding turf

Phil complained about this the most, even though his idea of a roll-up approach is using the drive through at **Krispy Kreme.**

areas as far as practical makes sense. Even adding by five more yards to your greens surrounds typically adds 50 percent to the turf area around the green and makes golf easier.

GREEN HAZARDS. Phil said greens are over-bunkered, and I agree. Sand is still a multiple stroke hazard for average players, while good players sometimes aim for bunkers because they are easy. Reducing sand in favor of any number of grass hazards – grass bunkers, chocolate drop mounds, fairway chipping areas – also makes sense. Sand hazards that extend well in front of the green create unnecessary difficulty by being in high miss zones and creating difficult, long bunker shots.

The artistic endeavor that is golf design often boils down to simple math problems of dimensions and percentages. Providing more turf in key high-use areas makes golf fun. More designers should play the percentages and design for average golfers, and not the best players who might show up. **GCI**

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SUPPLEMENT



How do turf colorants save money?

Awareness of the benefits of using turf colorants has been growing over the past several years. Many golf course superintendents have been successfully using the products for years, and more are integrating them into their programs with greater frequency. The practice that has been standard among superintendents is now popular in lawn care and professional sports turf management as well.

Why have turf colorants grown in popularity? Many golf course superintendents and other turf management professionals are finding new ways of using the products to meet the challenges that come with limited budgets. Growth in this trend is largely due to application efficiencies associated with turf colorants, especially when compared to the cost of overseeding programs.

HOW DO THEY COMPARE?

For years, many superintendents have invested in costly fall overseeding programs to keep their course green through the winter when warm season grasses are dormant.

The direct costs associated with annual overseeding programs include seed, fertilizer, water, pest control products and the hours of labor it takes to prepare and convert the course to winter play conditions. An indirect cost of the programs is revenue losses from decreased rounds-played and clubhouse purchases.

With just one application of most turf colorants, you get instant green color

without all of the additional inputs. That means less money spent on labor, fertilizers, pesticides and water costs.

Products like Becker Underwood's Green Lawnger turf colorant provide a solution for an attractive surface that is affordable and non-invasive, with little to no disruption of golf play.

EASING SPRING TRANSITION

Consistent turf color and an extended golf season are additional benefits exhibited by the application of turf colorants.

The elimination or reduction of seeding perennial winter turf grasses provides a clear agronomic benefit to the quality of warm season turf as it emerges from dormancy the following spring. Dark colored turf readily collects and holds solar heat, improving the transition out of cool-season dormancy. Warm-season grasses like Bermuda find spring emergence easier with less competition from cool season turf types.

Becker Underwood makes Transition, a dark turf colorant with UV heat-absorbing technology that helps elevate plant and soil surface temperatures. Higher temperatures can slow the onset of dormant turf as cold weather approaches and reduce damage to new growth during the temperature variations that come with the freeze-thaw cycles of spring.

SPOT TREATMENT

Using turf colorants for spot treatments can help disguise damaged, worn

or even diseased turf throughout the year. They can be especially useful in drought situations when water availability is limited.

Some turf colorant products improve accuracy and convenience of herbicide and fungicide applications. Using a colorant with these products can help achieve uniformity, while adding a long-lasting green color.

Unlike other spray colorant products that quickly fade in sunlight, Becker Underwood's Vision Pro application aid produces a natural-looking green color on turf that resists the adverse effects of prolonged UV light exposure.

TIPS FOR SUCCESS

Application rates vary by brand, so you may need to experiment to get the color and the consistency you want. Multiple applications will enhance the turf's appearance and color longevity.

Some brands of turf colorants eventually fade to an unattractive blue color. Becker Underwood's Green Lawnger brand colorant products with ColorLock technology produce a long-lasting, healthy-looking, rich green color that will not fade to blue.

When using turf colorants, avoid overspray on concrete, masonry, or other objects you do not want to color. Remove accidental overspray with a water rinse prior to drying. Rinse spray tanks, spray nozzles and screens thoroughly with water immediately following use of turf colorants.



GREENER LONGER

GREEN LAWNGER® TURF COLORANTS Natural Looking. Long Lasting. Cost Effective.

For a quick and easy solution for natural-looking, year-round green turf, add Green Lawnger® turf colorants to your management program. Green Lawnger turf colorant products can replace or significantly reduce overseeding programs. That means less money spent on labor, fertilizers, pesticides and water costs. Green Lawnger provides instant color — which you control when and where it goes — with minimal disruption of golf play. More green, more play, more profit.



*Made with Becker Underwood's
exclusive **ColorLock™** technology
for long-lasting, UV-resistant color
that won't fade to blue!*

**BECKER
UNDERWOOD**
Inventing the Future

To find out how Green Lawnger turf colorants can work for your turf,
contact your Becker Underwood representative or local distributor.

800-232-5907 beckerunderwood.com
801 Dayton Avenue, Ames, IA 50010

Green Lawnger® is a registered trademark and ColorLock™ is a trademark of Becker Underwood, Inc., Ames, IA.





With the Toolcat 5610, you won't have to slow down to start up another machine. You won't waste valuable space occupied by equipment that only gets used occasionally. And, you can eliminate the extra costs of maintaining multiple machines.

The Toolcat utility work machine can comfortably transport two people, haul all necessary tools around the golf course, and finish the job in one trip. The four-wheel independent suspension system and automotive-inspired cab features, including foot pedals, adjustable seat and adjustable tilt steering wheel, give the Toolcat 5610 the fit, finish and comfort of an automobile. At the same time, these rugged machines are built to Bobcat® equipment standards so they can power through tough jobs with ease.

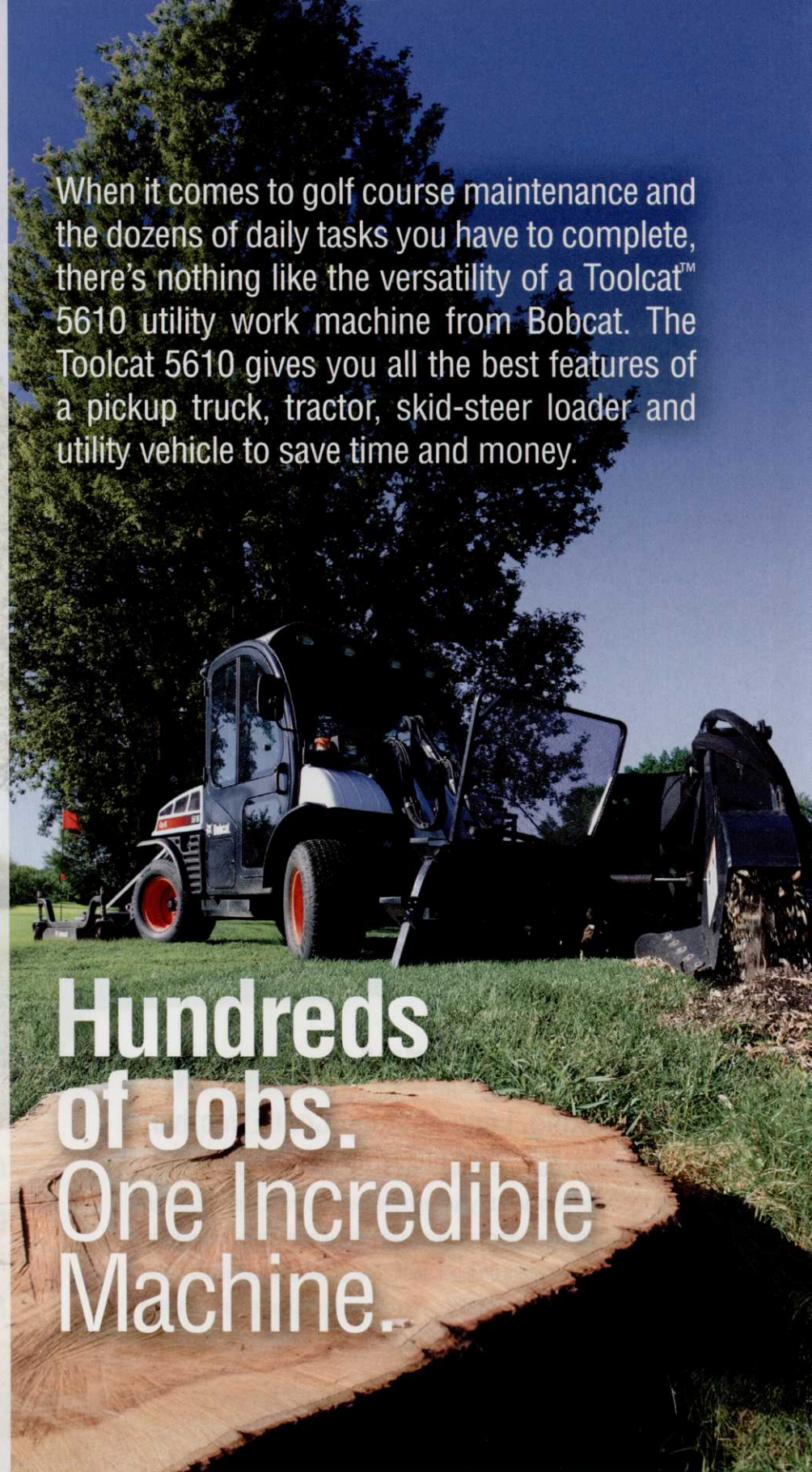
Bobcat's hydrostatic traction control (HTC) system provides superior traction on loose gravel or dirt, and the precise maneuverability of all-wheel steer lets you do more in tight spaces while minimizing turf disturbance.

With its 1,500-pound rated operating capacity (ROC), the Toolcat 5610 is capable of lifting heavy pallets of sod or hardscape materials and transporting them around the grounds. A 2,000-pound bed payload (more than most pickup trucks), hydraulic dump bed and a 4,000-pound towing capacity makes this machine capable of hauling all of the tools you'll need for a variety of tasks.

In addition, the Toolcat 5610 has a selection of more than 40 attachments that can be changed in less than a minute, making this machine a seriously versatile worker in your grounds maintenance fleet. Transform the way you work with the front and rear capabilities of the Toolcat 5610 that combine lifting, towing and attachments with options for 3-point hitch, rear PTO and rear remote hydraulics. Blow snow, then blade the tight corners. Sweep, then blow leaves or debris. Easily transition between jobs — or finish two tasks in one pass.

For more information on how you can make the Toolcat 5610 work for you, visit www.bobcat.com/GCI

When it comes to golf course maintenance and the dozens of daily tasks you have to complete, there's nothing like the versatility of a Toolcat™ 5610 utility work machine from Bobcat. The Toolcat 5610 gives you all the best features of a pickup truck, tractor, skid-steer loader and utility vehicle to save time and money.



Hundreds of Jobs. One Incredible Machine.



Bobcat®

One Tough Animal.

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THE RIGHT IRON

MAKES ALL THE DIFFERENCE.



The Toolcat™ 5610 is making history with attachment and implement capabilities so diverse, you might need a caddy. The Toolcat 5610 uses more than 40 Bob-Tach™-mounted attachments up front, and its optional 3-point hitch and PTO open up limitless combinations of complementary category 1, 3-point hitch implements in back. Get the job done faster, and keep your patrons on course.



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One Tough Animal™

Keep water moving through turf

Water... is there anything more important to sustainability on this planet? It has been the one constant that has made life on earth possible. Water is a compound we have been searching for in our universe to see if life exists on other planets. If water is so critical to life, would it not be the one variable that we must focus on to ensure viable healthy turf?

Think about some of the challenges you may have faced in your career. Black layer, sodium toxicity, pathogenic fungi, sulfate reduction, waterlogged soils, hard pan, thatch, color uniformity, fertilizer effectiveness and general turf health. They all can be affected by the management of water.

Effective moisture management has always been a critical part of any turfgrass maintenance professional's success. The desired result is always the same: even distribution of moisture throughout the root zone. Achieving this balanced state is an challenge and without the proper tools it is a practical impossibility.

SOILSURFACTANT.COM

SoilSurfactant.com was developed so that all who are interested in saving water in turf applications have the opportunity and means to do so. The price of a surfactant, wetting agent or

penetrant used in this pursuit should never preclude anyone from using them. Our customers have found that the cost per acre is far below the industry average, while obtaining remarkable results. The products pay for themselves by increasing soil health secondary creating sustainable aerobic soil ecologies and reducing the amounts of water needed. This in return saves tremendous amounts of money which can be reallocated.

SOME OF OUR PROFESSIONAL GRADE WATER SAVING PRODUCTS.

Penterra (Penterra.NET)

For aerobic soil conditioning, frost prevention, penetrating hydrophobic substrates, dew suppression.

Penterra is professional grade soil penetrant (*SoilPenetrant.com*) designed to move water off the surface and deep into the ground. Moving a fresh supply of water is important as it can carry with it a fresh supply of dissolved oxygen to aerobic microorganisms. If this process does not take place, carbon dioxide can build up quickly and lead to many differing challenges. Penterra decreases the surface tension between water, soil and plant to blast through hydrophobic soil conditions. Penterra's beneficial effects are noticed rapidly, in

many cases after a single application.

HydraHawk (HydraHawk.com)

For all-natural, aerobic soil conditioning, penetrating hydrophobic substrates, water retention.

HydraHawk is a powerful all-natural penetrant/wetting agent designed to manage and keep soil moisture levels optimum while remaining 100 percent biodegradable. HydraHawk is made from all natural materials being derived from fruits, vegetables and essential oils. Secondary to its formulation, HydraHawk offers penetration into challenged hydrophobic substrates, yet subtle enough to add some holding capacity within the root zone without disruption of aerobic balance. HydraHawk is a natural powerhouse in moisture management being that it keeps water penetrating into the soil while holding viable water in the root zone for sustainability.

Humawet (Humawet.com)

For water retention, developing soil profiles, new greens.

Humawet is a unique soil surfactant with incorporated high-grade humates designed to enhance water holding capacity. By prolonging the retention of moisture within the root zone, this formulation allows turfgrass managers to reduce irrigation volume and hand-watering when faced with hot, dry or excessively windy situations. Its beneficial effects when used to combat LDS are noticed rapidly, and when used as a preventative measure it can keep such unsightly issues from developing. Especially helpful when used on sandy soils or those low in organic content, Humawet is both easy to use and economical.

Visit SoilSurfactant.com for more information on these unique water saving products. Remember, it all starts with water.





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IF YOU WANT...

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- 3) Minimal labor costs in your workshop
- 4) Optimum performance and maximum life of your cutting equipment
- 5) To minimize potential for premature wear and tear on your cutting systems
- 6) Premium "Quality of Cut"
- 7) To maximize the effectiveness of chemical and water usage
- 8) To make a wise investment to achieve all these goals

THEN READ ON...

In today's economy where everyone is looking at maintenance cost and trying to be more frugal than ever, Foley United is pleased to provide options that will stretch your dollars and maximize your investments! How so you ask...

WORKSHOP PRODUCTIVITY

Foley United introduced the first completely enclosed "table-top" spin grinder in 1993 and with a patented hands free "auto-index" relief system, the time and effort for a complete grind has been cut by more than 75 percent!

Operators now have the ability to enter programs for specific reel makes and with the push of a button, they are 100 percent away from the machine while the machine does the work!

Many old style "spin only" users who've converted to Foley's newer technology still enjoy the quick touch-

up spin grinds, but it's the ease and automation of relief grinding that has them re-conditioning the reels to "like new" on a more regular basis.

With all the top-dressing being done today, making it easier to grind and doing so with automation reduces the labor cost in your shop on one of the most important preventive maintenance practices the technicians can do.

PERFORMANCE

Once the reel and bedknife lose their sharp edge and "shape," horsepower required to simply rotate the reels can increase from an approximate 0.8hp per cutting unit to as much as 2.5hp per unit! Your five-gang or triplex still cuts, it still works, and the equipment is designed to be able to function like this, but you can easily see that operating like this for extended time frames can negatively effect the overall life of the cutting equipment.

A simple re-conditioning of the reels on a little more regular basis will not only minimize load on the engine and hydraulic systems, but it will ultimately save money on fuel and save money on premature wear of components.

Adjustments are easier, units stay on cut longer, and not having to backlap or grind as often will lower operating costs. These are only a few of the benefits that Foley United can provide with their wide range of grinders.

"QUALITY OF CUT"

In addition to excessive load on the cutting equipment, dull cutting units have adverse effects on the ability of

the grass to refract sunlight, directly effecting the aesthetic aftercut appearance. The torn and frayed grass tissue gets dried out by the sun, produces a brown hue across the turf surface, and 'die-back' occurs which slows the recovery growth rate of the grass by "X" percent.

Poor cut quality can weaken the root structure of the grass and make the grass more susceptible to disease. This can make chemical use less effective, and can effect water absorption rates to levels where you wind up spending more money for both.

Lower heights of cut, newer grass strains, and reel manufacturers looking for advantages with reel technology make re-conditioning and staying sharp more important for performance and optimum cut-quality than ever.

\$300,000-\$500,000 CUTTING EQUIPMENT INVESTMENT

When the average course owning between \$300-\$500k of cutting equipment looks at what does all the work and provides the "quality of cut," they soon realize they've spent a tremendous amount of money to make three to five cutting heads cut grass.

With this in mind, there is only one tool in your shop that you use to re-condition what does all the work, and that's GRINDERS.

Grinders are a 15- to 20-year long-term investment and is a minimal expense when looked at in the big scheme of achieving goals.



NO MATTER HOW YOU GRIND IT

Spin or relief, the choice is yours with Foley United for the best quality of cut.

For "spin only" operations, nothing beats a Foley for speed, accuracy and ease of use. Or choose the hands-free "auto index" relief system that lets you take on other tasks while the machine does the work. Either way, Foley keeps your reels performing like new.

Visit us at foleyunited.com.



**Setting the Standard with the
World's Most Valued Grinders**

Rain Bird Integrated Sensor System

While advanced central control systems make it possible to manage golf course irrigation throughout the course from one computer, these systems do not measure soil conditions where they matter most – in the root zone. That's why Rain Bird offers the Integrated Sensor System (ISS), a multi-component soil sensing system that provides accurate snapshots of soil conditions and the ability to automatically adjust irrigation system run times.

"The ISS takes irrigation system control technology to a new level, helping to ensure the most consistent playing conditions and improved course sustainability," said Bruno Quanquin, product manager for Rain Bird's Golf Division. "Because superintendents know exactly what's going on with their

turf, they can successfully manage irrigation while potentially reducing water, fertilizer, herbicide and pesticide costs for an improved bottom line."

The ISS is the only soil sensing system in the industry that delivers real-time full central control integration. Sensors transmit soil moisture, salinity and temperature data to the system's Soil Manager software, which in turn works with the course's central control system to make real-time decisions about when and how long to irrigate. Because of its full integration with Rain Bird central control software, the ISS can automatically set individual station run times based on changes in soil moisture. Because superintendents define all the parameters, they retain total, customized control of their irrigation systems at all times.

Located in important areas on the course, the system's Data Loggers

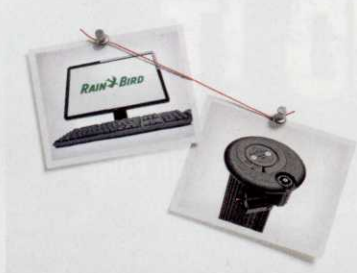
receive and store data from up to 18 sensors each, transmitting the information through a wireless mesh communication network to the Soil Manager Software. If transmission is impeded by long distances, undulating terrain or line-of-sight obstructions, information is routed through a Data Repeater on the course to the computer. The number of Data Repeaters installed on a course will vary depending on the number of sensors and course topography. Signal range and strength can be extended with additional Data Repeaters.

The Data Logger displays sensor data on a large LCD screen with an extensive menu. Superintendents can read the sensor information at the Data Logger and immediately evaluate soil conditions without having to return to their office computers. Data is backed up on the Data Logger's SD card, keeping it safe even in the event of a power outage. Data is also stored on the course's irrigation computer, eliminating the need to subscribe to expensive third-party Internet monitoring services.

Each system's Data Logger also provides power to the sensors, making it unnecessary to dig up the greens after a few years to replace sensor batteries as in competitive sensing systems. Plus, unlike those competitive technologies, Rain Bird sensors provide accurate readings immediately after installation with no need for calibration.

"Research has shown that some superintendents want the information provided by sensing systems, but they don't have the budget to purchase many sensors all at once," Quanquin says. "That's why we made the ISS easy to expand. Superintendents can start with one sensor and then add to their systems as demand and budgets permit."

For more information, watch the flash demo at www.rainbird.com/ISS, contact your local distributor or call 1-800-RAIN BIRD.



"Superintendents can start with one sensor and then add to their systems as demand and budgets permit," says Bruno Quanquin, product manager for Rain Bird's Golf Division.

Watch the demo and learn more
about the Rain Bird® IS System at
www.rainbird.com/ISS



Getting a better read
on your course.

That's intelligent.



Only the Rain Bird® Integrated Sensor System™ (ISS) delivers accurate soil sensor readings immediately following installation without calibration, and dynamic central control integration.

Through accurate, real-time measurements of moisture, salinity and temperature, the Rain Bird® ISS can help save time, water and other inputs, while maximizing turf health. The easy-to-install ISS can be used as a standalone system or can be seamlessly integrated with a Rain Bird central control. The ISS can even automate irrigation and adjust run times based on sensor feedback. Monitoring your course's hotspots without breaking into a sweat. That's The Intelligent Use of Water.™

RAIN  BIRD®

Get the most out of aerification

Each year, innovative products are rolled out to the amazement of many at the Golf Industry Show. From water-management systems to golf carts, superintendents, course owners and others are shown glimpses into the future of the business. At this year's show, one such product was The Carrier from Redexim Charterhouse.

So what sets The Carrier apart from others in its category? According to Paul Hollis, executive vice president of Redexim, everything.

"The Carrier is a unique piece that, when combined with the Verti-Drain 1513, makes an excellent greens and tees aerifier," he says. "Unlike other walking greens aerifiers, it will penetrate at depths up to six inches and has our patented parrellogram that provides a true forced-heave action that will lift and fracture the soil, relieving compaction like no other machine in the industry."

Concerned about the weight of The Carrier and the effects it will have on

greens? Don't be. Hollis points to its large turf tires that create a footprint of less than 7 psi - which is lighter than the average man - while providing better traction and stability than the competition.

With courses having to make each dollar stretch further than ever before, cost is always a factor. With a price tag in the mid \$20,000s, purchasers will need to justify the added expense.

"It saves money in the long term by being more than just a walk-behind aerator," Hollis says. "The Carrier is designed to be an all-purpose tool carrier and can be fitted with seeders, verti-cutters, and other implements. So the end user doesn't have to purchase multiple power units, but instead just adds more tools to his arsenal - freeing up budget funds to be used elsewhere."

That saves money over time, but what about today?

"It saves money in the short term by being faster and wider than other machines," Hollis says. "The productiv-

ity rates are higher than other machines and transport speed is quick as well. So there is less time aerating, which means less inconvenience for golfers and fewer headaches for superintendents."

As for the early feedback, it has all been positive, according to Hollis.

"The end-user seems to see the need for a niche product such as The Carrier," he says.

The future is bright for The Carrier, especially as more superintendents try the product and offer suggestions.

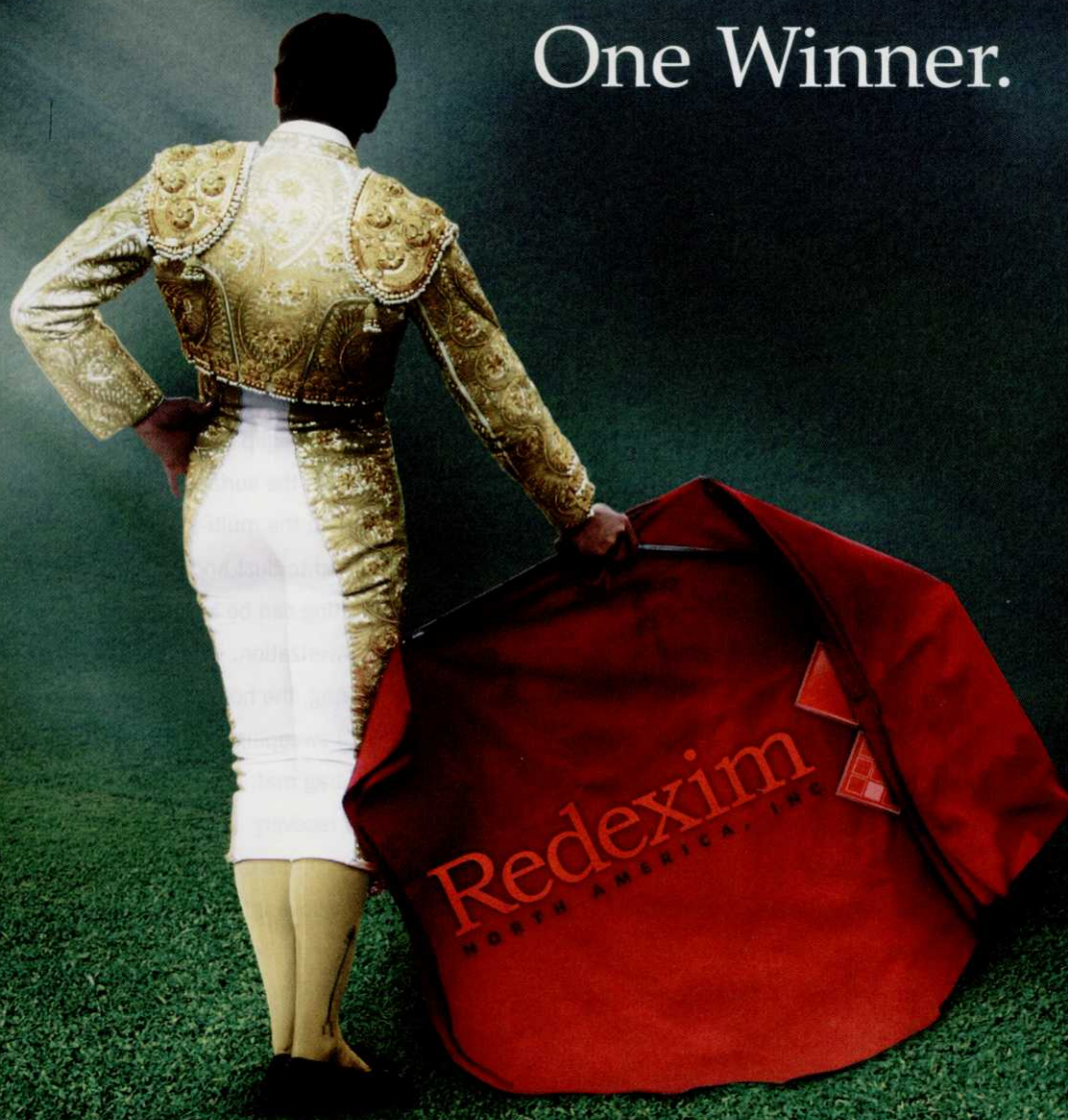
"We have had an overabundance of suggestions of different attachments to fit the machine to go along with the aerator such as, turbine blowers, snow blades, sod cutters, trenchers and lots more," says Hollis.

Not surprising, considering superintendents are notorious for creatively modifying existing equipment with everything from PVC piping to Duct Tape to meet their needs in the maintenance department.

"The Carrier is designed to be an all-purpose tool carrier and can be fitted with seeders, verti-cutters and other implements," says Paul Hollis, Redexim vice president.



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Redexim North America leads the way in turf management with products like the Verti-Drain, Verti-Seed, and the Sand-Master. We set trends, we don't follow them. So if you're looking for the most advanced turf-management tools on the market, with the best after-sale and service program in the industry, not to mention the most satisfied customers — take a look at the leader of the pack. **Redexim North America — We know our turf.**



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Super 500 Payback

The **Super 500** is a heavy-duty sweeper/verticutter/flail mower collection system that will pay for itself time and time again due to the many functions that can be performed with this one machine. The Super 500 can be configured as a low-cost solution to sweeping and collecting leaves, clippings, cores and other materials. The optional multi-purpose sweeper head allows for verticutting and flail mowing while collecting clippings into a 3.5 cubic yard hopper with a high dump reach up to 83". With the quick installation of the pulverizing kit, it can also be used to pulverize cores either during verticutting or without verticutting.

The **Super 500** does a superb job of **collecting** wet and dry leaves, sticks, pine cones, pine needles, grass clippings, etc. It also performs some mulching of material while sweeping and collecting. The airflow is so great that the multi-purpose sweeper head does not come in contact with the surface. Once collected, debris can then be deposited into a dump truck or a container with the high dump feature allowing dumping up to 83" off the ground.

The **Super 500** will **verticut** and collect the thatch in one pass. This allows for verticutting without making a mess.

Verticutting becomes a one-man, one tractor operation. Most golf courses are required to close while using a typical verticutter due to excessive mess and the necessity of using many resources for clean-up. With the **Super 500**, you can verticut during play with optional spacing of $\frac{3}{4}$ ", 1 $\frac{1}{2}$ ", or 2 $\frac{1}{4}$ ". In addition, the **Super 500** has a high dump hopper that will lift up to 83" high.

By replacing the verticutting blades with **flail blades** (no tools required), the **Super 500** becomes the ultimate tool for mowing native areas and collecting the clippings in one

pass. The robust design of the **Super 500** and the flotation axles of the unit allows for operation in these difficult areas. In addition, when equipped with **flail blades**, the **Super 500** is a great tool for scalping for overseeding prep or cool season grass removal in the Spring. Again, debris can be dumped in a container or dump truck by using the high lift feature of the **Super 500**.

The **Super 500** works extremely well as a **core pulverizer** by installing brackets on the rear door of the hopper, creating a 4" gap (see photo), which allows materials to fall back to the surface. Due to the verticutting blades and paddles on the multi-purpose head of the Super 500, cores are turned to dust and redistributed back onto the surface. Verticutting can be accomplished at the same time as the core pulverization, if so desired. After verticutting and/or pulverizing, the hopper brackets can be easily uninstalled for the final sweeping of the surface after it has been dragged with a drag mat. At this point the fairway is ready for watering and recovery.

In 2010, the deflector shield of the Super 500 was extended, allowing dust particles to be blown into the ground versus out of the back of the machine (see photo #4). This **enviro-friendly dust minimizer** has become very popular in many parts of the country where dust emissions are regulated.

For more information, please contact Wiedenmann North America, LLC at www.wiedenmannusa.com or www.terraspikes.com

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Verticutting and Core Pulverizing



Debris Clean-up



High Dump Feature



Scalping for Overseeding Prep.



Flail Mowing in Native Areas



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Fall is the perfect time to tweak maintenance practices and tweak your turf before winter sets in.

You can feel it in the air and under your feet. The days are shorter, the nights longer. Summer's brutal temperatures have moderated. There are fewer golfers on the course. Superintendents don't have to be weathermen to know when autumn is nigh.

Fall is an ideal time to not only restore the vigor of turfgrass, but also get it prepared for the next full growing season. A superintendent's management practices during the autumn months can have significant positive effects on the quality of grass, especially cool-season varieties, the following season. Density and growth rebound in turfgrass during the fall and fertilization is a vital factor that aids in the process.

Mike Luccini, greens superintendent at Franklin Country Club in Franklin, Mass., begins his winter preparation of turf shortly after Labor Day weekend.

"Most of what we attempt to do is derived from plant physiology 101. We try to increase the solid matter in the plant and minimize the liquid levels. Minimizing the liquid obviously involves trimming



A solid fall fertilization program can mean the difference for a quick green up next spring.

Cooling off for FALL

by John Torsiello



Total Golf Cart Power Solutions from Trojan

Working hand-in-hand with golf cart manufacturers and golf course management teams for over 85 years has given us a unique understanding of how golf cart power solutions add value to your bottom line. At Trojan Battery Company we devote our expertise to providing advanced deep cycle battery technologies and product accessories that lower your operating and maintenance costs.

T2 Technology™ Golf Batteries – Our lineup of 6-volt, 8-volt and 12-volt deep cycle golf batteries with T2 Technology is engineered for exceptional battery performance. With advancements in performance features, Trojan's golf batteries deliver maximum operating performance, longer battery life and increased total energy.

HydroLink™ Watering System – Proper maintenance and watering are important factors in maximizing the performance and life of your Trojan batteries. The HydroLink system removes the guess work out of maintaining your batteries. Saving you valuable time and money, HydroLink fills a complete set of batteries in just 30 seconds.

Experience the value of Trojan. Contact your local Trojan distributor today.



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“Most of what we attempt to do is derived from plant physiology 101. We try to increase the solid matter in the plant and minimize the liquid levels.”

—Mike Luccini, Franklin Country Club, Franklin, Mass.

the irrigation way back. We have dense tree lines, thus irrigation is rarely necessary after the third week in September, save for some spot watering.

“In terms of timing for late season nitrogen, we wait until after the first frost then apply roughly one pound of nitrogen to all of our greens, tees, and fairways. At this time of the season, there will be minimal top growth, and most of the nitrogen will be utilized to produce root growth. Late October, our first snow mold application goes down on our greens and tees. All told, we’re usually fully wrapped up just prior to Thanksgiving.”

Patrick Daly, superintendent at Framingham Country Club in Framingham, Mass., will typically fertilize fairways sometime in September with a granular and continue with any liquid applications when he sprays late into the fall.

“The goal for tees is to apply two half-pound nitrogen applications once mid-September comes with one application when we aerify tees. Greens will be fertilized with a granular product when we aerify/DryJect the last week in September. Depending on the summer and what we are seeing for late fall weather, we might try to sneak out two to three weeks after with another granular product but will continue supplement with our soluble program as needed into the fall.”

Bret Proctor, superintendent at Oak Tree National in Edmond, Okla., also begins his fall fertilization program in September. But fertilizer application is just one step he takes to help his turf recover from the rigors and vagaries of summer and heal before winter sets in.

“I apply potassium to all Bermuda grass areas. Mowing heights are raised and traffic control is regulated in the higher traffic areas, so winter damage is limited and the dormant turf provides a quality playing area until spring. We have three holes that we restrict cart traffic on because of the limited sunlight on these holes through the winter.”

Proctor says that restricting cart traffic to certain areas that receive minimal sunlight during the winter months is a must.

“The lower angle of the sun causes limited sunlight to reach the turf through the trees

in winter. This, combined with cooler soil temperatures, delays the break in dormancy compared to areas that are more open. These areas are typically two to three weeks behind the rest of the golf course and if cart traffic is not removed or limited in these areas it is early summer before there is a good stand of grass. Cart traffic through these areas in the winter months can create unnecessary damage.”

Chris Snyder, superintendent at Stonebridge Golf Club in Rome, Ga., applies fertilizer early enough to help prepare his Bermuda grass for dormancy. He believes a pre-emergent application must be applied before temperatures and rainfall amounts are conducive to annual bluegrass germination.

“Tees and green surrounds receive fertilizer and a pre-emergent application around the third week of September. The bentgrass greens are treated with Bensusmec after aerification in September with a follow-up application in October. November would be too late for our area since annual bluegrass has already begun germinating due to lower temperatures and rainfall amounts in October.”

Ron Frecking, superintendent at Devou Park Golf Course in Covington, Ky. says, with warm season grasses, they let them grow a little long before dormancy and put down potassium. With cool season grasses, they fertilize heavily in the fall to recover from the summer and grow roots.

“We mow one last time as late as possible, keep free of leaves and get down a good broad spectrum fungicide just before dormancy,” he says. “The last cut of the year should be the best cut of the year with sharp blades for a crisp, clean cut.”

Michael Daugherty, superintendent at Sunset Hills Country Club, Edwardsville Township, Ill., aerates his course’s cool season turf areas, including greens and rough.

“Our fairways and tees are zoysia, which is a warm season grass,” he says. “The only thing we do to them in the fall is apply a fungicide for the prevention of zoysia patch disease that comes around in the moist spring months. We also let the height of our warm season turf grow up before it goes dormant to allow the

turf a better chance of survival in the winter. All of the cool season turf areas receive fertilization in late September to early October to establish good growth going into the winter."

Brett Chapin, superintendent at Redding Country Club in Redding, Conn., has taken a different tack the last few years and altered his fall fertilization program based upon University of Wisconsin-Madison and Penn State research. Their research found that late and heavy nitrogen applications were likely wasteful and/or not as beneficial as has been taught.

Chapin supplies nitrogen through quick release forms, such as ammonium sulfate or urea.

"Forty to 60 percent of my yearly nitrogen totals are applied with these applications," he says. "All of my fertility programs are geared toward bentgrass management. I want to avoid providing nitrogen when *Poa annua* desires it the most. In my location, September is a very important month for *Poa annua*, as it begins to recover from the summer stresses. Adding nitrogen at this time will assist in the recovery efforts of the *Poa*, while causing an undesirable flush of growth from the bentgrass."

Dustin Riley, superintendent at Oconomowoc Golf Club in Oconomowoc, Wis., spoon feeds his greens with liquid fertilizer every seven days until Thanksgiving. He applies one pound of granular nitrogen mid-October following aeration. Tees and fairways are fed with one pound of granular nitrogen during mid-October following aeration. The goal is to increase root production, store carbohydrates and the treatment is timed to minimize plant growth. After November, lime is applied to tees and fairways to help correct pH. This results in a quicker green-up during the spring.

Daly pays close attention to weather conditions to determine when to fully implement his fall maintenance plan.

"The weather is the determining factor in all maintenance practices," he says. "I would rather wait or skip an application until the weather conditions are in my favor. We monitor predicted snowfall for our final snow mold application on greens, tees and fairways."

"Ideally, we like to have everything completed prior to the first snowfall," says Luccini. "In our part of the country it's possible to have permanent snow cover by Thanksgiving, thus we target the third week of November as a completion time for our winter prep."

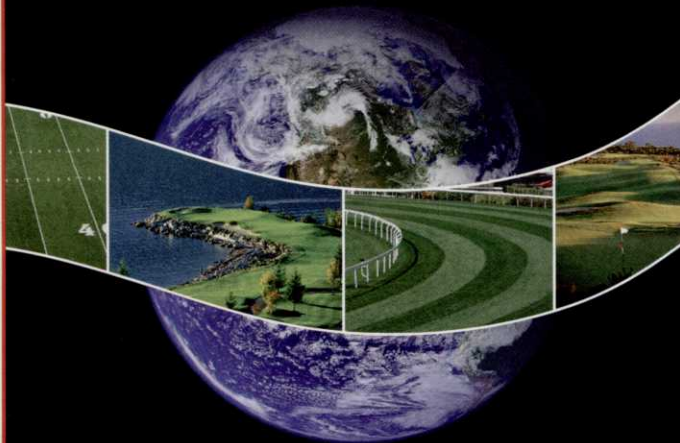
Snyder tries to apply fertilizer early enough to help prepare the Bermuda grass for dormancy. The pre-emergent application must be applied before temperatures and rainfall

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amounts are conducive to annual bluegrass germination.

Luccini says weather is the biggest factor. "I constantly monitor it throughout the season. We play the weather here and call a lot of audibles, so to speak."

Fall fertilization can vary from tee to green.

"We place the highest emphasis on our greens and tees, and lesser emphasis on fairways," says Luccini. "This translates into the number of plant protectant applications being higher on greens and tees and lower on fairways."

"Greens do not receive the same application as the Bermuda areas because they are bent grass," says Riley. "Spoon feeding greens with liquid fertilizer has increased root production during the fall months. Greens will be aerated twice, verticut heavily and receive a double drill and fill. It is very important we recover and maintain plant health."

"On fairways and tees," says Daly, "we have used an organic that is mixed with seed during aerification. It is applied after we mow but before we aerify. It is then dragged in with the plugs and allows us to better incorporate seed into the holes. We use this process with any approach and fairway expansions as well."

Frank Marra, superintendent at Pine Ridge Golf Club in Coram, N.Y., uses a combination organic and synthetic dormant feed with a goal of getting down one pound of potassium sulfate/M for winter hardiness on his greens.

"The nitrogen source won't release until

"Mowing heights are raised and traffic control is regulated in the higher traffic areas, so winter damage is limited and the dormant turf provides a quality playing area until spring." — Bret Proctor, Oak Tree National, Edmond, Okla.

soil temps begin to go up in the spring, which leads to a nice steady spring green up. The treatment is purely for the sand-based greens. This program would be too costly for the tees and fairways. Timing is critical. On the greens, we shoot for the turf to be entering dormancy, usually following two to three heavy frost events. Our traditional timing on fairways and tees is in early October, which is prime growing season."

Chapin also changes up his basic maintenance practices once autumn arrives.

"Once the weather cools and top growth slows, I'll increase mowing heights a little, approximately 15 to 20 percent on greens. I will substitute an extra roll or two each week to help maintain putting smoothness and speed. When possible, I'd prefer to have the bentgrass producing and storing energy, not repairing mowing damage."

Daly likes to aerify whenever possible in the fall and continues to apply light rates of sand topdressing depending on weather and the growth rate on the greens.

"I aim to apply sand topdressing on greens and tees prior to covering," he says. "We'll

aerify and topdress our practice tee once it closes in the fall and prior to covering, which helps it come out of the winter ready for early spring practice. Cutting heights are raised and smooth front rollers are used once we perform our aerification on greens in the fall. We slowly allow our fairways, tees, and approaches to grow a little, reducing mowing frequency depending on weather and wear issues due to low light and surface moisture."

Marra typically adjusts cutting heights up slightly going into the late fall due to reduced sunlight and colder temps.

"Our goal with aerification is to go into winter with no open holes. We want a nice tight turf canopy to minimize invasion of unwanted species in the spring and protect against winter desiccation."

Fall maintenance sometimes includes trial and error.

"We cover greens each winter, and a late winter application, if necessary, revolves around the ability to have the granular product break down without the aid of irrigation since we blow out our irrigation around Thanksgiving," says Daly. "The worst thing I could do is apply a granular application and then drag it around when installing our greens covers. I am planning to play around with higher rates of solubles in late fall to determine if that is a tool I have been underutilizing."

Luccini attempted late core aeration and topdressing back in 2003 and paid a price.

"With the course practically dormant around Nov. 1, we core aerated, top dressed, and filled the holes with sand. Little did I realize we would incur one of the most severe and damaging winters ever. I feel the dragging we did to incorporate the sand bruised everything and exacerbated the winter kill problems we had next spring.

"We had a lot of sand on the greens the next spring and no turf growth, thus it took weeks to get the sand entirely incorporated into the turf. In the meantime, our mowers were dulled from the sand, which just added to the challenges. Our equipment tech was re-sharpening reels daily until all the sand was dissipated." GCI



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MY THOUGHTS ON TEE IT FORWARD

Earlier this summer, a USGA and PGA of America unveiled a program called "Tee It Forward." In case you missed it, here is what I consider the most relevant part of the press release:

"To help golfers have more fun on the course and enhance their overall experience by playing from a set of tees best suited to their abilities, The PGA of America and the United States Golf Association have partnered to support 'Tee It Forward,' a new national initiative. Tee It Forward encourages all golfers to play the course at a length that is aligned with their average driving distance (see accompanying chart for guidelines). Golfers can speed up play by utilizing tees that provide the greatest playability and enjoyment."

Tee It Forward was greeted as if it were the second coming of Bobby Jones. Players, officials and the golf media latched onto it like a life preserver promising to float the golf industry to economic success. Barney Adams, the founder of Adams Golf and the individual widely credited with pushing the Tee It Forward concept, became the darling of the golf world for his revolutionary idea.

To which all I can say is, "Huh?" Isn't teeing it forward for fun and lower scores obvious?

Playing from the proper tee – proper for you, that is – should be one of golf's bedrock principles. However, golfers do what they want to do. If they want to take a cart, they will. If they want to fix a ballmark or rake a bunker, they will. If they want to walk on your line, they will.

So if they want to play from a tee better suited to their games, they will. But they don't, or at least very few of them do. They pay the big bucks to play Pebble Beach or Bethpage Black and they want "the whole experience," so they move a tee or two back from where they should be hitting and spend the entire day looking for balls in the rough and hitting fairway woods into greens on par fours. They do the same thing at their home courses, too.

Can they honestly call that fun? I call it foolish. And while these same guys – and, rarely, gals – might try teeing it forward once or twice, my gut tells me they'll soon be creeping back, convincing themselves only the championship tees show them the "real" golf course and provide a better

test of their games.

When I was a kid learning to play golf, my father wouldn't let me play from anywhere but the forward tees. He wanted me to learn the fundamentals of the game, specifically why you do certain things as a player or a caddie. He made me want to go to the golf course by holding me back until I was ready. He wanted me to learn about tradition, sportsmanship and the other principles at the game's core.

My early experiences also taught me the fun and usefulness of playing from different tees. To this day, I like to choose my tees, moving around day to day. It allows me to practice my game, use different clubs, and see new areas of the course. I'll even occasionally tee it up with my wife from the forward tees to experience a drivable par four. Now that's fun.

Players, officials, and the golf media latched onto it like a life preserver promising to float the golf industry to economic success.

Years ago, I remember reading in a golf magazine an instruction tip that suggested starting the new golf season by playing a few rounds from the forward tees as a way of getting used to the idea of shooting lower scores. That always struck me as a pretty smart idea.

Something that doesn't strike me as smart – or all that relevant – is the concept put forward by golf's governing bodies that by teeing it forward amateurs have the chance to play a course at the same relative distance as the tour pros. I think they are saying if you're hitting your 7 iron into the green from 150 yards and the pro is hitting his 7 iron in from 180 yards, you're getting the same experience. I don't buy it. But more importantly, it doesn't matter. This isn't about the pros at all.

What I absolutely do agree with is that if more golfers were hitting approach shots with 6 and 7 irons, rather than fairway woods, hybrids and long irons, their chances for enjoyment increase. Also, playing from forward tees should result in

(continued on page 65)

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TREES BRING GREEN...

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To find a balance between trees and turf on a golf course and maintain sustainability and budgetary goals, superintendents need to think like urban foresters.

By Nicole Wisniewski

When the American elm that towered over Winged Foot Golf Club's No. 10 East green in Mamaroneck, N.Y. succumbed to Dutch elm disease in 1993, members were devastated.

Despite the fact that this tree confounded their approach shots for decades, they gave the tree a proper send-off, standing in silent salute as it was taken down and calling it the "greatest tree in golf." Even the New York Times' Dave Anderson eulogized the tree, and Bob Alonzi, Winged Foot's superintendent, said: "This tree was like a person to us."



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A tree sets the stage as a recognizable part of the course, and be a point of pride for players.

While trees can give a course its signature edge and draw attention and pride from players, unmaintained they can become a bane to golf course superintendents, causing pruning and shade challenges that can impact playability and budget.

"Superintendents are turf experts; they are always looking down at the green, and trees become an obstacle in their quest to grow perfect, playable turf," explains Michael Bova, a project coordinator with the Davey Resource Group and an International Society of Arboriculture Certified Arborist

and Certified Tree Risk Assessor, based on the West Coast.

Because turf is king on the course, trees tend to take a backseat. "And when tree care is deferred for too long and it starts to show, members complain, pride of the course decreases and maintenance costs increase," Bova says. "It's a vicious circle."

But in today's age of heightened sustainability concerns and economic challenges, properly caring for course trees in a proactive fashion means the difference in course aesthetics and maintaining a tight budget.

THINK LIKE AN URBAN FORESTER. Liability is a superintendent's biggest concern when maintaining large trees on a golf course. But reacting to major issues when they occur, such as lightning strikes or turfgrass performance issues – or what Thomas Schlick calls "knee-jerk reactions to tree care" – can be very expensive.

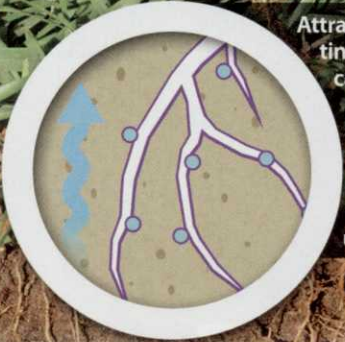
"You wouldn't plant a tree in the end zone of a football field or the back of a soccer pitch and then wait for problems to ensue, dipping into your emergency funds to deal with them, so why would you do this on a golf course?" says Schlick, Southern division manager of Davey Golf Course Maintenance and a certified golf course superintendent. "Even the best architects can't envision what trees are going to do 50 years after they are planted."

Conflicts arise when superintendents who are excellent at growing turf sometimes lack the knowledge necessary for maintaining a healthy forest. So what tends to happen is a violation of standard urban forestry practices, resulting in wasted resources, money and

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decreasing the benefits the course provides to members and the community.

To properly care for the trees on their courses, superintendents must think more like urban foresters, Bova advises. Being proactive vs. reactive can not only keep planning time and maintenance costs in check, but can also enhance the golf course's standing in the community. The course as a mini forest, maintained properly, provides essential benefits to the surrounding area, including boosted property values and energy savings, carbon sequestration, improved air quality, reduced stormwater runoff and enhanced cooling.

FOLLOW TREE CARE STANDARDS. Today, most dollars spent on trees in golf course maintenance are dedicated to those that are in the field of play. Trees on the fringe or property perimeter get less attention than others, Schlick says. As a result, liability increases and sustainability decreases because forest health and overall benefits decline.

A golf course tree maintenance program should focus on all course trees and should center around what Bova calls the three Ps – planting, placement and pruning.

Planting. When planting or transplanting trees, superintendents need to ensure they are the proper species for the course, which means they have minimal leaf litter, are low maintenance and provide the values they seek. Just because one species is removed doesn't necessarily mean it should be replaced with the same species, Bova says. A major problem with many courses across the country today is tree monoculture.

A mixed age class is also important for golf course trees. Ideally, 15 to 40 percent of an urban forest should be made up of young trees 12 inches or smaller in diameter, 25 to 30 percent of a forest should be made up of mature trees between 12 and 30 inches in diameter and the remaining 5 to 10 percent of a forest should comprise trees more than 30 inches in diameter, Bova says.

"A sustainable urban forest requires spe-

cies and age diversity," he says. A golf course should have no more than 10 percent of any one species and 20 percent of any one genus.

A balanced mix of tree species and age placed properly can better handle severe weather events, insects and diseases and be more naturally low maintenance, providing sustainability and budget goals. Creating a monoculture could be a huge liability issue if, for instance, an invasive pest or destructive disease enters the forest. This was unfortunately the case with the Winged Foot American elm, and those trees are now on a preventive, proactive program to ensure their safety and long life, says Mike Cook, an ISA Certified Arborist with The Care of Trees, who takes care of trees on more than 15 golf courses in the Northeast, including Winged Foot.

Placement. Strategic tree location in the long-term will provide room for growth that is consistent with the course strategy and play challenge.

"It's not just about filling a hole," Bova says.

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Not only does a tree's species factor into whether or not it will survive on a course, even its placement on the course comes into play. The Oaks Club, Osprey Fla.

"It's about putting the right species in the right location to grow to a mature size without impacting other trees or reducing the playability on the course."

Pruning. Proper pruning is the ultimate key to having course trees continue to provide positive playability challenges and aesthetic benefits, as well as reducing maintenance costs. Many times, superintendents thin trees annually to ensure turf receives adequate light, which can be around six to eight hours for bentgrass, Cook says. But overpruning forces the tree to push out growth and develop weak branch attachments, increasing pruning needs to continue to ensure turf receives light and, as a result, driving up maintenance costs. Trees placed in locations that match their health needs should be able to hold for three years between prunings. "Any more and the tree is basically telling you it's the wrong species for that location or planted in the wrong place," Bova says. "On top of that, excessive pruning is not a sustainable practice because it shortens trees' lifespans, decreases the benefits they provide and increases your costs."

Irrigation is another key factor concerning trees on golf courses. Because courses are being irrigated in most cases for turf, trees are not receiving proper hydration. They develop excess surface roots, which create additional conflict when roots damage mowing equip-

HIGH-TECH TREE TRACKING

An excellent way to manage trees on a course is by conducting a tree inventory with the help of global positioning system technology.

"This is incredibly beneficial as it helps you better manage your trees, providing you with species statistics, approximate age and a rough assessment of other characteristics you can start to track," Schlick says.

This level of planning can also help superintendents when handling difficult situations with members or greens committees – for instance, an uproar over a tree removal or a member's insistence on planting a memorial tree in a poor location on the course.

A golf course superintendent's ultimate goal should be to create a long-term tree plan and budget for annual tree care, keeping tree pruning on a three- to five-year rotation so each year a new set of trees is trimmed. "With a better plan, superintendents can better educate their members so when trees are removed they can show there are valid reasons," Bova says. "With a plan, superintendents can also express their desire to plant trees and maintain a healthy, sustainable forest that benefits them, their members and the community around them."

TOP LEFT: COURTESY OF THE OAKS CLUB, OSPREY FLA.
TOP RIGHT AND RIGHT: COURTESY OF DAVEY TREE

Tree root systems should run deep, so the tree can sustain itself on rainwater rather than irrigation. The Westchester Country Club in N.Y., a white oak at the left side of #11 south green.



ment and prevent optimum turf growth. Trees also don't benefit from fertilizer used for turf on a course.

Some trees, such as pines used on golf courses in the Southeast, do not thrive in these excess moisture environments. "So when they border a fairway where turf gets heavily irrigated, they tend to turn yellow or show other signs of stress and are more susceptible to borer infestation," Schlick says.

"What we're seeing now is more golf courses expanding tree rings and putting mulch down so they don't have as much of a tree-turf conflict and still have a somewhat playable surface," Bova says.

As golf courses are pressured to become more sustainable, they are also removing turf areas in exterior roughs and turning them into native habitats to reduce water use and maintenance costs. While creating these ecological areas is positive, it can be detrimental to trees. "While trees don't use a lot of water, they are typically accustomed to surface watering via turf and therefore have developed surface roots," Bova says. "To protect these trees, instead of just shutting down irrigation, provide trees with some drip irrigation so they can establish a deeper root system and then be weaned off so they can sustain themselves on rainwater. Trees aren't big water users but they have to be considered when reducing water use. Losing a 50-foot oak is a lot more costly than removing a few square feet of turf." **GCI**

Nicole Wisniewski is a senior project manager with The Davey Tree Expert Company, Kent, Ohio. She can be reached at nicole.wisniewski@davey.com.



A tree should only need pruning once every three years – more frequent pruning will make the tree push out new growth faster. Hole 11 at the Mesa Verde Country Club in Costa Mesa, Calif.



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.

A NIGHT OUT

It has been another tough year – too much rain, too little rain, hurricanes and scorching heat. You deserve a night out. But before you get too excited, I am suggesting you spend a night, all night to be exact, in your irrigation pump house. If you have never spent a night with your pump system, it can be an educational experience. Pack a cooler, bring a chair, take along a pad (paper or iPad) and you're ready.

So why spend a night in your pump house? To listen! To listen for how the pumps come on and go off. To listen to how the drive – if you have one – ramps up and down. To listen to how the pumps switch from one to two to three and how they go off. And if you hear something odd, to look at the pressure, the flow, the time and what pumps are operating.

There are more exciting things to do than sit in a pump house all night. And you could argue your monitoring software shows you everything going on and alerts you if there are issues. True, but you could be having issues that your flow meter, pressure transducer and monitoring software are not picking up because your pump system technology is not fast enough. Not convinced? Here are a few examples.

A New Jersey golf course with new irrigation and pump systems was having coverage issues. Dry spots were about five feet from the sprinklers and it was getting worse daily. The sprinkler manufacturer said they were having some nozzle issues so all of the nozzles were replaced. Two weeks later, there was no change in the coverage. When the system was operated, everything looked fine. Out of ideas and, frankly, excuses, the superintendent spent a night in the pump house. He quickly discovered the filter on his

pump system was backwashing many times an hour. Each time the pressure was dropping significantly. This was a definite cause of the poor coverage given the frequency of backwash. This was a surprise, as it did not show up on the monitoring software, nor was the system shutting down on the low-pressure shut off. Turns out the pressure transducer was incorrectly installed before the filter – not after, as it should have been. So the pump station control panel never saw the frequent low pressure. It never reacted or showed it on the monitoring software. Solution: move the transducer and change the filter screen mesh.

A New York golf course with two booster pump stations had an issue

half hour. On the last trip when everything shut off he heard something different: irrigation. However, it was not his irrigation; it was all the houses in the neighborhood. This was a high-end private course in and affluent neighborhood. All the houses had landscape irrigation systems and it seemed they were all scheduled to start at 2 a.m. The golf course was at the end of the road on the ocean. Basically, once the residential systems came on, the golf course was starved of water. The problem was found, but the solution was not easy or inexpensive to fix. Temporary fix: start and finish irrigation earlier.

A Las Vegas course purchased a new, larger pump station to operate its

If you have never spent a night with your pump system, it can be an **educational experience**.

with the stations shutting off on the low inlet pressure safety several nights a week. The problem never occurred during the day. So a night out was scheduled, but with the variety of going back and forth between two pump houses. Irrigation system start was 11 p.m. As well as listening, it was important to watch the flow and incoming pressures and document them. Things were fine until about 1:30 a.m. Then the city pressure started to drop from 50 psi to 30, then 20, then 15 psi. The system shut off at about 2:05 a.m. The superintendent had no idea why both pump systems shut down at almost exactly at the same time, even though on opposite ends of the course. Driving pump house to pump house required traversing some residential neighborhoods as the superintendent switched pump houses about every

existing irrigation system. Monitoring software picked up large changes in flow and pressure during the night. Conclusion: the new pump system is not reacting fast enough to changes in the irrigation system. So a night out is set to listen to the pump station. Schedule starts at 7 p.m. At 7:25 the pump station goes berserk. The course's irrigation tech informs the assembled masses the irrigation system shut off about half the sprinklers for about 10 seconds and then turned them on. This may not be a big deal for most courses, but in Las Vegas, half was about 60 sprinklers. No wonder the pump system had a fit. Turns out it is not a pump station issue but an irrigation issue. Their old pump station wasn't quick enough to pick up these demand fluctuations (paddle wheel vs. Mag meter) but the new one was. **GCI**



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BATTLING

To combat snow mold resistance, superintendent Bill Stein investigates alternatives to his course's traditional treatment.

By Bill Stein



Stein

As the golf course superintendent at Minocqua Country Club in Minocqua, Wis., for the past three years, I prepare my course for the cold, snowy winter weather every year. Snow mold control is always a top concern for me as well as many other Wisconsin and across the northern Midwest superintendents. My first year in this region, I underestimated how much higher snow mold pressure is here as compared to North and South Dakota where I had worked.

Fortunately, when I started at Minocqua in the fall of 2008, the prior superintendent had already planned and purchased products for a snow mold program that I was able to apply. If I had been in charge of the program, I likely would have selected a lighter application which would not have produced such great results under extreme snow mold pressure. These past three years have been a learning experience in controlling such extreme snow mold.

That same fall, we sprayed a fungicide on our greens, tees and fairways as our last chemical application of the year to combat snow mold. The following spring, I learned just how vital it is to have perfect chemical coverage from fall applications. As the snow melted and the turf started to grow, we noticed only half of the turf had been treated on one of our tees; the untreated area was completely dead. In other parts of the course, we noticed that even the slightest

miss with the sprayer showed up in the spring.

Knowing we needed to eliminate the chance of skips and operator error, we decided to try splitting our application. The next fall we sprayed half of the application and then waited to spray the remainder of the application as close to the first snowfall as possible. We figured this method would guarantee at least 50 percent coverage if there were equipment or operator errors. Even though this meant we had to spray twice, this technique makes sense and works effectively since snow mold control is so vital for my course.

For many years the course had successfully used one particular product to control snow mold. However, due to my overall philosophy in chemical management, I am investigating different products. I believe if you use the same chemicals repetitively and do not vary the active ingredient, the snow mold can become resistant to the active ingredient and the product won't be as effective.

My search began last summer for an alternative product. I studied the snow mold control trials from the University of Wisconsin's turf research department to gain insight into the market. I turned to their site not only because of their reputation, but also because our current program was based on data from their trials years earlier.

After all my research, I decided to run an on-site trial with Bayer's

Interface and Triton FLO. I liked the results I saw from the trial and after looking at several different products, I met with my Bayer sales representative to begin the trial in October 2010. It was 45 degrees when I applied Interface at 6 oz./thousand acres and Triton Flo at .85 oz./thousand acres to a bentgrass fairway and rough. To ensure proper application and full coverage, I used an air induction nozzle that sprayed 60 gallons/acre.

This combination of Interface and Triton FLO provided the competitive snow mold control I was looking for, with absolutely no snow mold breakthrough. The control lasted throughout the spring, even though we faced a rather cool spring that could have increased snow mold issues. In Wisconsin, where it remains cold long into the spring season, it's important that the sun's heat is drawn to the soil for quicker turf green-up to open our courses on time.

The Bayer trial demonstrated the treated areas were not only snow mold-free, but also had more vibrant color than I'd seen on my other fairways. The turf showed quicker green-up. At this time, my decision to switch to Bayer's snow mold program is driven by continued success of the product in the field as well as the cost-effective price in the present economy. **GCI**

The author is superintendent at Minocqua Country Club in Minocqua, Wis.

SNOW MOLD

BY JOHN C. STIER AND WAYNE R. KUSSOW

Buffer Strips, Runoff, and Leachate

Research compares nutrient loading in runoff and leachate when buffer strips are used alongside golf course fairways.

Federal mandates to decrease nutrient pollution of water supplies are resulting in various local and state regulations aimed at reducing phosphorus (P) movement into surface waters and nitrogen movement into groundwater. Some regulations aim to reduce nutrient and sediment loading into surface waters based on the idea that “native” or prairie vegetation should be used as buffer strips between mowed turf and natural areas or surface water.

Some research indicates that dense turf vegetation is more effective at reducing runoff and nutrient leaching than other strategies, including mulched landscaped beds. Data are just starting to be published that report on the effectiveness of prairie buffer strips to reduce nutrient loading in water runoff and leachate relative to turf. Also unknown is the size requirement of buffer strips relative to the area they are to be buffering.



Some research indicates that dense turf vegetation is more effective at reducing runoff than other strategies.

Turf is often used as a ground cover throughout inhabited areas including golf course roughs because it is relatively easy to establish and maintain, provides contiguous ground cover throughout the year under traffic and mowing, and the low mowing height facilitates hu-

man activity while discouraging vermin and insect pests. The turf species allow some type of turf to be established across a diversity of situations, including moist or dry soils, and moderately shaded to full-sun conditions.



Prairie planting takes less care, but can cost more to get started.

man activity while discouraging vermin and insect pests. The turf species allow some type of turf to be established across a diversity of situations, including moist or dry soils, and moderately shaded to full-sun conditions.

Prairie plantings are being increasingly promoted as a low-cost alternative to managed turf. They are also seen as “native,” while most cool-season turf species were introduced from Eurasia. Although management is usually much less intensive than turf, establishment of prairie vegetation is not necessarily less expensive than turf, as prairie seed may cost considerably more. Prairie establishment may take years, during which time weeds, especially noxious weeds, must be regularly controlled. Lastly,

the installation of prairie buffer strips can be costly, reduce valuable golf turf areas, and promote the assumption that turf has inherently negative environmental consequences.

Data from various projects suggest that annual nutrient loading from mowed turf may be similar to that from prairies, as most of the nutrient loss occurs when nutrients are leached from dead foliage. When we began the study in 2003, there were no data that directly compared the efficiency of turf to prairie vegetation for its ability to minimize runoff and leachate pollution, particularly during the establishment phase, which can last for two to three years.

The project goal was to compare the relative amount of nutrient loading in runoff and

leachate when prairie and fine fescues were used as buffer strips alongside golf course fairways. We also wanted to determine the effect of three different ratios of buffer strips relative to the fairway area draining into the buffer strips. The information will be useful for predicting effectiveness of different vegetation types and buffer strip sizes on golf courses.

GROWING BUFFER STRIPS AND INSTALLING WATER SAMPLERS.

Research plots were constructed in 2003 at the Wisconsin River Golf Club (WRGC) in Stevens Point, Wis. The golf course is adjacent to and drains into the Wisconsin River. Two large natural areas exist within the course and the course is surrounded primarily by forest with a small amount of agricultural land. The plots were developed in the roughs that drain fairways 4, 8, and 9. Fairways were approximately 85 feet wide and crowned in the middle with 1-2 percent slopes. Fairway turf was predominantly annual bluegrass (*Poa annua* L.).

Buffer strip plots were installed at the edge of the fairways and had slopes ranging from approximately 1 to 4 percent. Plots on fairway 9 were in full sun, plots on fairway 8 were in slight shade, while plots on fairway 4 were moderately shaded. Treatments included 2:1, 4:1, and 8:1 fairway-to-buffer-strip ratios, with one ratio each of prairie or fine fescue mixtures. A seventh treatment in each replicate was a no-buffer-strip plot.

Runoff collection flumes (1-meter width) were installed at the lower end of each buffer strip plot. Each collection flume had a cover to prevent debris from falling into the flume,

while a screen-covered slit at the soil surface allowed runoff water to enter. Leachate was collected in each buffer strip, using a low-tension lysimeter installed just upslope of the runoff collection weir.

Plots were dormant-seeded in October, as recommended for prairie plantings, and they were covered with a biodegradable wood fiber erosion control blanket. Prairie plots were planted with a commercial prairie seed mixture that included flowers and grasses. Fine fescue plots were seeded to a commercial seed mix containing Chewings, creeping red, blue and hard fescues.

None of the plots were irrigated, treated with pesticide, or fertilized during the study. Plots were mowed (clippings returned) at 30-inch height in early spring 2004 and 2005 to encourage new growth in accordance with recommendations for prairie establishment. Fairways received 108 to 216 lb. N acre⁻¹ annually in one or two applications (spring and fall), with approximately 5.5 to 11 lb. P acre⁻¹ each year. Fairways received little to no irrigation, so snow melt and rainfall provided the source of runoff water. The 9th fairway remained flooded from excessive rainfall throughout most of 2004 and part of 2005 and was dropped from the study.

ANALYZING WATER QUALITY AND VEGETATION.

The leachate water samples were analyzed for nitrate- and ammoniacal-N and soluble phosphorus. Runoff samples were analyzed for three P types: soluble P, biologically active phosphorus (BAP), and total phosphorus (TP), which were extracted from both sediment in the water as well as

the water itself. Sediment in runoff was collected and quantified. Turfgrass and prairie plant stands were analyzed two to three times each year by determining the percentage of desirable plants (turf or prairie), weeds and bare soil.

RESULTS AND DISCUSSION. Fine fescues covered nearly 40 percent of the ground by early May 2004, while weed seedlings were the only vegetation on the prairie plots. Fescue cover was excellent by August, while annual weeds covered 80 percent of the ground in prairie plantings. A few prairie plants were present, but they comprised less than 1 percent of the ground cover. By June 2005, fescue cover remained dense and prairie vegetation had increased to 18 percent, though weeds still covered more than three quarters of the plot area. Several of the prairie flower species were evident by summer 2005, though few bloomed that

during the sampling period in 2004 ran off fairway and buffer strip surfaces, while less than 1 percent of rainfall ran off during 2005. The minimal slopes of the fairways (1-2 percent) likely helped infiltration to occur by reducing speed of runoff despite periods of heavy rain. The nearly complete ground cover was likely just as, if not more, important for reducing runoff by slowing its rate and allowing it to infiltrate into the soil.

None of the buffer strips changed runoff or phosphorus loading compared to the fairway alone, indicating fertilizer was not an important source of phosphorus. Total phosphorus losses on a land area basis were similar, or less than, the annual 0.1 kg P ha⁻¹ loss reported for native prairie in Minnesota when rainfall-induced runoff averaged 6 mm per year, and similar, or less, than the 0.18 to 7.04 kg P ha⁻¹ in surface runoff from a variety of Oklahoma grazing lands.

pared to predominantly exposed soil. In exposed soil situations, sediment bound P is often the primary type of P. Vegetation greatly reduces total P runoff by reducing both runoff volume and sediment, though soluble P may increase as it leaches from vegetation and organic P-containing particles move in runoff. Prairie plants may be especially prone to P loss from vegetation, as they are predominantly C4 plants with foliage that dies in early autumn, while C3 turf foliage may survive the winter and has a steady but low turnover rate coupled with less abundant above-ground biomass than prairie vegetation.

In our study, about 25-50 percent of the total P in runoff was bio-available P (BAP). This is the type that stimulates algae blooms in ponds, lakes, and rivers. Values in our study were at least 20 times less than BAP in wheat field runoff and similar to BAP runoff from native grassland. Our data are important because they represent natural background levels of phosphorus. Consequently, regulations to limit phosphorus fertilization would in this case be ineffective at reducing phosphorus loading. Ultimately it is impossible to achieve zero P runoff.

Buffer strips did not affect phosphorus or nitrogen leaching below the soil surface. Nitrogen is the most important nutrient contaminant in leachate water because excessive levels in drinking water may have adverse human health effects, such as blue baby syndrome. The U.S. EPA sets the drinking water limit at 10 ppm nitrate-nitrogen. In our study, this level was exceeded in 2004 under the fine fescue plots, but the results were not statistically different from leachate under prairie plots or fairway alone. The higher concentrations in

2004 were likely due to soil disturbance effects from the establishment process and lack of vegetative cover until May 2004. In 2005, all nitrogen concentrations were below 10ppm and were likely lower than 2004 because more vegetation existed in the second year.

Phosphorus has generally been regarded as having little movement in soil and so most leaching studies do not measure phosphorus. However, increasing awareness of ties between ground and surface water may soon require additional knowledge of phosphorus leaching. Easton and Petrovic reported more than 50 percent of P applied to turf from swine compost leached below the surface, while synthetic fertilizer sources had significantly lower leachate losses. Our study indicates that an unfertilized prairie stand has similar levels of P leachate compared to unfertilized fine fescue turf and fertilized *P. annua* fairways. Phosphorus and nitrogen contamination of runoff and leachate water from golf course fairways was similar to natural background levels reported for nonfertilized native prairies and was not affected by buffer strip type or size. **GCI**

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Editor's note

A more complete version of this report can be found at USGA Turfgrass and Environmental Research Online: <http://usgatero.msu.edu/v05/n22.pdf>

year. None of the prairie grasses were ever observed, consistent with several of our other establishment projects using similar prairie seed mixtures. Prairie plots on fairway 4 had more weeds, especially *Poa annua*, than plots on fairway 8 that were less shaded. Regulations requiring native vegetation for buffer strips in situations where climatic conditions are not favorable are likely to result in unwanted vegetation and/or exposed soil that will not necessarily decrease nutrients in runoff or leachate.

In our study, less than 5 percent of the total rainfall

Phosphorus runoff in our study was more than 20 times less than that reported for wheat production, probably due to greater vegetative cover in the golf course system. Phosphorus sources in our study likely included natural sources such as vegetation, soil, and precipitation. We've found similar results when comparing Kentucky bluegrass (*Poa pratensis*) and prairie buffer strips for controlling urban runoff.

A growing body of evidence indicates that when ground is well covered by vegetation (e.g., 70 percent), total P losses may be much reduced com-

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Travels With Terry

Globetrotting consulting agronomist Terry Buchen visits many golf courses annually with his digital camera in hand. He will share 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.

COVERED SPRAY BOOM

This sprayer boom is used in the maintained rough – which is not winter overseeded – along the fairway edge to control drift when applying a post-emergent herbicide so the chemicals do not drift onto the winter-overseeded fairway. This under-mount covered sprayer boom has four spray nozzles and a rubber shroud bolted to the boom's metal top portion. It is the exact width of the rear tractor wheels on this 2004 John Deere 5205 tractor with turf tires. The 1996 100-gallon Broyhill sprayer was previously mounted on a utility vehicle. The original sprayer framework is welded to a three-point hitch forklift attachment. A PTO pump was acquired and attached to a homemade bracket so it will not turn when the PTO is operating. An additional homemade bracket to hold the manual-operating on/off valve, pressure gauge and pressure regulator is mounted on the ROPS bar for ease of operation by the spray technician. Backpack sprayers with two nozzles are used for the tie-ins. Superintendent Brian Sarvis and equipment technician Pablo Cortes at River Hills Golf & Country Club, Little River, S.C., conceived, designed and built this unique idea for about \$800. The sprayer boom was manufactured locally and the remaining work was done in-house and took about five hours to design and build.



DROP SPREADER/SEEDER CALCULATION

This Lesco drop spreader/seeder is used for winter overseeding the tie-ins around the bunkers. Jeff G. Greene, irrigation technician, at Arcadian Shores Golf Club, Myrtle Beach, S.C., designed and built this easy and effective way to calculate the application rate for grass seed. Previously, Greene used a 100-square-foot or 1,000-square-foot measurement marked on the concrete floor in the maintenance building where the seed was applied, then swept up with a broom and weighed. Greene came up with a better way. A 6-inch diameter PVC irrigation pipe, with the top portion removed and cardboard and duct tape installed on either end, was fitted to the bottom of the spreader/seeder to the exact width to catch the grass seed. A 100-square-foot or 1,000-square-foot area is measured-out on the turf and the amount of seed is caught in the PVC pipe, weighed and then adjustments are made to the seeding rate as necessary and appropriate. There is an L-shaped metal bracket – installed at the factory – on either side adjacent to the spreader/ seeder mechanism that opens and closes and helps hold the PVC pipe in place along with two bungee cords. The PVC pipe was in the club's inventory. It took about an hour to design and build. Eric Covelli is the golf course superintendent. **GCI**



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(MORAGHAN continued from page 48)

lower scores, shorter distances traveled on each hole and even fewer lost balls.

Let me share another perspective. A few months ago, I took a lesson from PGA Teaching Professional Marty Nowicki at Turning Stone Resort in upstate New York. He had his own ideas about getting golfers to play from the right tees, especially when they are starting out.

"Move up to the 100-yard mark and treat every hole like a par 5," Marty suggested. "Scoring 5 for a new golfer with some good basic advice is a good score. If you can't get down in 5, start from 50 yards or even 30 yards with the same objective. That is how people should learn this great game.


"If we applied this concept to other sports," Marty went on, "you would never start a new skier on a double Black Diamond trail, for example. You


would start her learning how to put on the equipment, how to walk in those heavy boots, how to put on the skis. Once she accomplished that, you would teach her how to walk in skis, and so on."

Which reminds me of the concept, taught by some golf pros and usually to kids, of beginning on the putting green with three-inch putts. Then moving further from the hole, then off the green, then back into the fairway, and so on.

I've seen studies that prove golfers who start this way – from the hole back – shoot lower scores faster than golfers who began on the driving range.

So we should all embrace whatever ideas get golfers playing better, faster, more intelligently and having more fun. Wherever you work, whatever you do, we should all have those goals in mind. **GCI**






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BONE DRY

My old buddy Joe Livingston summed up what it's been like trying to keep bentgrass greens alive in Texas this summer: "I was seriously hoping a bus would just run over me and end the grind of this thing."

The "thing" is a mean-spirited drought that has chomped down on Texas and the surrounding region like a pit bull on a mailman's ass. And, according to long-range NOAA projections, it may not let loose for another year or more. The famed *La Niña* may be settling in like an unwelcome relative in your back bedroom.

The view out the window on my flight into Dallas was sobering. From the air, places that should have been verdant greenspace looked more like the color of Kansas wheat at harvest time. It's brown and brutally hot.

Joe's facility, the fabled River Crest CC in Ft. Worth, is lucky to have both an adequate budget and ironclad, century-old rights to pull water out of the nearby river, so green isn't an issue.

Stress is, though: "We've had one inch of rain the last 100 days and it's been over 90 [degrees] since about June 15. Everything is right on the edge all the time." A check of the weather history proves his point: there were 70 days of 100-degree or higher temps in the DFW area, the hottest stretch since they started keeping records in 1895.

Joe's relying on a regimen that includes foliar, venting, raised cutting heights and great communication with members. He also has a veteran staff featuring a couple of guys who were there before Livingston was born. The place looked awesome against all odds.

Texas superintendents are no strangers to drought. It's the nature of the beast down there, just as it is periodically in many parts of the coun-

try. But the intensity and potential duration of this one combined with increasing scrutiny of "cosmetic" irrigation makes it a different breed of cat. Unrelenting, long-term drought.

While I was in Texas, I spoke to a group of golf/turf customers at the annual BWI Expo during their big event at the Gaylord Texan near DFW. All of them were singing the same sad song: This is bad and it's not likely to get better soon. "We're in survival mode," said one guy who was hiding in the back of the conference room. "I can't remember what rain feels like."

(Unnecessary side note about the venue for the BWI meeting: There will never be a drought at the Gaylord Texan. They have a damn-near full-scale replica of the Alamo, the San

feeling the brunt. More than 15,000 trees in Houston's Memorial Park are dead or dying and the removal cost alone will be an estimated \$5 million. God only knows how much it will cost to reforest the area or whether city fathers can justify it if another drought's right behind it.

At the risk of dredging up the whole Global Warming thing, suffice it to say that this issue is not going to go away in Texas or anyplace else for that matter. Trying to grow grass at a tenth of an inch in a blast furnace while relying on nearly 100 percent irrigation is just not sustainable.

The solutions aren't easy. Turf research – particularly seed breeding for things like drought-tolerant species – is hopelessly underfunded at the

"We're in survival mode," said one guy who was hiding in the back of the conference room. "I can't remember what rain feels like."

Antonio Riverwalk and an actual river inside this ginormous terrarium of a hotel. The place seemed like it was Texas under glass as imagined by Walt Disney on acid. But I digress...).

Houston is getting hammered too. A recent Wall Street Journal article quotes Charles Joachim, the superintendent at Champions GC: "It's like we've had a big 'H' (high-pressure system) parked over us all year and we've had to watch the rainy weather rotate counterclockwise around Texas, like the spokes on a bicycle wheel." Up the street at the Tour 18 "tribute" course, the replica of the 17th at TPC Sawgrass is perfect except for one thing: no water left around the island green. Oops.

And it's obviously not just golf that's

moment. A lot of top-tier courses have efficient irrigation systems that do use water more wisely, but most facilities don't. We have managed to gain some political traction in places like Georgia where a massive effort driven by Mark Esoda and a handful of leaders resulted in some recognition that golf uses water more wisely than others. Yet, in most regions, golf course water usage will continue to be restricted more randomly and more heavily because regulators, legislators and the public at large just don't see the benefits.

In bone-dry Texas, the short term looks like more of the same. The question is what the long term will hold in the Lone Star State... and in your home town. **GCI**

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