

Right On Line

Sometimes green speed and consistency
are easier to *feel* than measure

BY DAVID FRABOTTA, SENIOR EDITOR

THEY MIGHT NOT NEED TO BE FAST, BUT THEY HAD BETTER BE CONSISTENT.
WHETHER YOU MANAGE A PAR-3, DAILY-FEE TRACK OR A POSSIBLE U.S. OPEN
VENUE, GOLFERS EXPECT GREENS TO BE IN HARMONY WITH EACH OTHER.

Of course, you'll hear gripes about speed, but they pale in comparison to the complaints you'll get if greens play differently around the golf course on any given day.

Cultural practices help create uniform conditions by replicating maintenance and fertility processes. That's the science part of it. But managing microclimates, weather and the lay of the land often render some greens on a golf course different from the others, requiring a bit of art to keep them in line.

Some superintendents Stimp. Others rely on their own sleight of hand.

"I don't play a lot of golf, but I putt my greens every day," says Chad Mark, superintendent of the Kirtland Country Club near Cleveland. "For me, it's a better gauge of consistency because I don't have a lot of areas to get accurate Stimpometer readings. It's to the point where I know where they are, and I can go from green to green and putt and know that I was getting a consistent speed."

Many of Kirtland's 1921 push-up greens, compliments of C.S. Alison, are "severely sloping" back to front, which makes Stimping a difficult proposition, especially when Mark keeps them running pretty slick to meet member expectations. On the few spots flat enough to get an accurate reading, they run about 11 feet, and he pushes 13 for tournaments.

Mark does more than just putt around his greens to see how they feel. The practice is a crucial routine that helps him make agronomic decisions depending on how they roll.

He's not alone. Many superintendents can be found putting around on their greens to make sure they are consistent from day to day and from green to green.

Russ Myers, certified superintendent of Southern Hills Country Club in Tulsa, Okla., putts every green every day. His 11 handicap is nothing to sneeze at, but you don't need to be able to break 80 to acquire useful data from putting your greens. He says his daily routine

allows him to gauge more than speed; it tells him how the ball rolls on the undulating Perry Maxwell greens.

"The same height of cut every day doesn't play the same every day," Myers says. "I can get a feel for how smooth they're rolling when I putt. But most importantly, my putter is in my hands to tell me how little mechanical stress I can get away with."

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The putting routine was imperative for Myers last summer, when the 35-year-old hosted his first Major tournament, the PGA Championship. Unfortunately for Myers, he had to walk a very fine line between mechanical stress and disease because of an unusually wet summer.

Southern Hills was so wet that the rough was too soft and fragile for even the lightest of commercial mowers, forcing Myers to buy 20 rotary push mowers from Home Depot so his crew (and a bunch of guys from the caddy shack) could get through the long stuff.

He reduced mowing on the greens to a few times a week — which wasn't too unpopular because few members braved the elements to play golf. Putting his greens every day allowed him to keep the mowers in the shop more often.

"They might seem fast, regardless of what the speed actually is, so that might be one less mow that I put on them," Myers says. "It's not about a number here. It's about feel, especially on greens that have a lot of undulations like ours do."

Other days, Myers says putting his greens tells him absolutely nothing. "It's not my Zen," he says. It's just one method to gauge how maintenance regimens are affecting ball roll and green-speed consistency. Stimping

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Right On Line

Kirtland Country Club's native greens (C.S. Alison, 1921) require a rigorous solid-tine aerification program on the *Poa annua*/bentgrass surface, says superintendent Chad Mark.



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and dropping balls from a waist-high position might be others.

At Butler National Golf Club in Oak Brook, Ill., superintendent Michael Sauls putts about half of his greens every day to get information about ball roll and green speed, and his assistant superintendent Stimps every day as well. Putting helps him judge ball roll, and Stimping allows him to keep greens around 11 feet to meet member expectations.

"Monitoring is the key," Sauls says. "My assistant does the Stimp meter reading for me, and I'm on the golf course with a putter in my hand every day. It's really just a matter of taking that information between myself being out there and the actual data from my assistant in order to make a decision about what you are going to do the next day."

The data Sauls compiles tells him whether to double-cut greens or roll on a given day, both of which he does about twice a week when he needs a little more speed to keep members happy.

Cultural practice makes perfect

Of course, measuring green speed and consistency, regardless of the method, is just a way to measure the efficacy of cultural practices that propagate healthy turfgrass and a smooth putting surface.

One of the most important programs is fertility and growth regulation. While fertility products vary from slow-release

granules to foliar-feeding liquids, the result is the same: steady, controlled growth.

"If you keep the rates light and adjust frequency based on growth, then you're going to have the most consistency day to day and throughout the season," Myers says. "In theory, if you could spray every day and adjust the rates based on the growth you got every day, then it would be just like adjusting the thermostat in your house."

While everyday feeding might be extreme from a labor perspective, managing growth flushes is imperative to consistency, which is one of the reasons plant growth regulators (PGR) have been adopted so widely at many clubs.

Mark uses PGRs on Kirtland's *Poa annua*/bentgrass greens every week from April through October.

"When plants come out of regulation, we have surges and goofy metabolic processes that can cause you to lose control of nutrition," Mark says. "I think it helps with consistency, and it helps heal faster after aerification."

Subsurface airflow is another crucial component to keeping healthy turfgrass, Mark says. In addition to two five-eighths-inch core aerifications every spring and fall, the crew uses a needle tine or star tine every month to get some gas exchange in the rootzone, keeping the classic course's greens healthy through August.

"An aerification program has to be

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Counter Culture: Raise the Height of Cut by Rolling

The United States Golf Association has spent \$27 million on grants for turfgrass research since 1983. As a major partner with academic researchers, the association is a pre-eminent force in helping to identify emerging maintenance trends and how they influence plant health.

In addition to academic data, the association's Green Section agronomists and its Turf Advisory Services are the most widely consulted third-party advisers to superintendents in the country. That means they see more golf courses collectively and can identify more trends than any bunch of turfgrass guys around.

Naturally, they spend most of their time talking about maintaining golf greens for playability and plant health. Surprisingly, the primary advice USGA gives superintendents is to raise their height of cut.

"Most of us as a staff today are trying to get clubs, even modestly budgeted clubs, to take advantage of the speed roller because

we're finding that guys are able to raise their cutting heights slightly, which makes for better turf health on a year-round basis, and yet not sacrifice speed to meet players' demands," says Bud White, director of the USGA Green Section Mid-continent Region.

Superintendents have been pushing the green-speed envelope for so long that many have insufficient fertility, rendering too much stress on their bentgrass, White says. Low fertility and extremely low mowing heights translates into more disease, inconsistent growth and unhealthy turfgrass that teeters on the brink of failure. Raising the height of cut and increasing rolling can create the same conditions without the added stress.

"Research shows that you can roll a reasonably built green three times a week without damage to the turf or soil compaction, so when it's done at the right times, there has been good success," White says. "Another thing that superintendents are doing a lot is going to a solid front roller

on the greens more in the summertime on bentgrass instead of the groomed roller because there is a lot less stress with that smooth, solid front roller."

At Crystal Downs Country Club in Frankford, Mich., certified superintendent Michael Morris has developed a system that not only raises height of cut, but he actually maintains expected green speeds by rolling his greens in lieu of mowing some days, which creates less mechanical stress, saves equipment wear and frees up valuable labor.

"It's a paradigm shift from the way you've normally done things," he told attendees at a Golf Industry Show session. "Rolling every day and skipping mowing (every other day) gave us the same result."

Incidentally, Morris Stimps his greens every day to ensure his cultural regimen is in line with member expectations. Every person in the maintenance department uses the number to determine his or her duties. ■

— David Frabotta

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built to develop a root system that's going to take the beating that we give these grasses today by pushing green speeds in the 11 to 12 range all the time," he says.

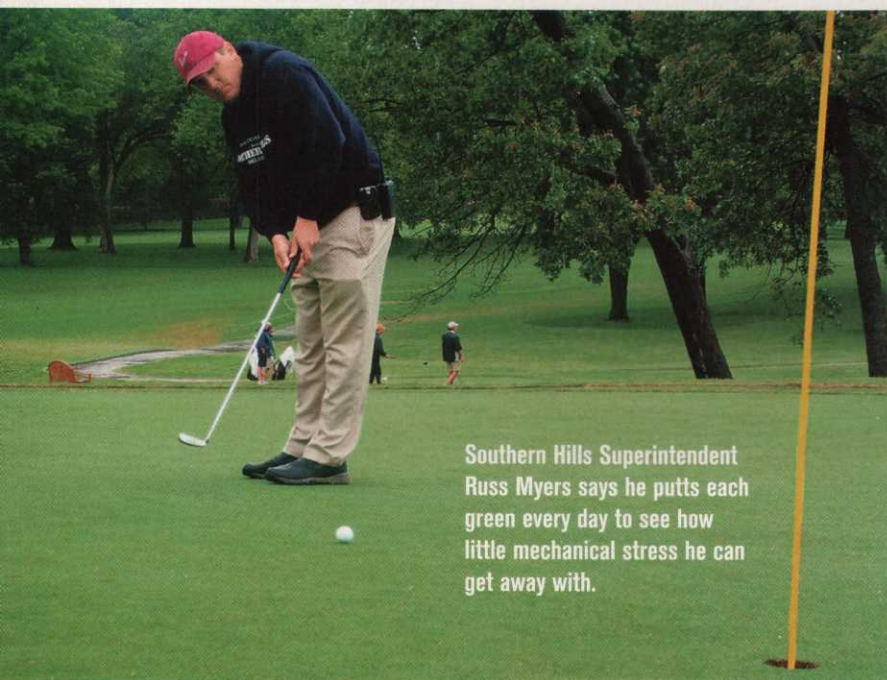
Of course, probably the No. 1 path to

consistency is mowing practices and uniformity. It's important that operators are trained to know how to spot mower mishaps or putting surface irregularities, and it's often the job of assistant superintendents to check each green to make sure mowers are operating properly.

Sauls says the operators on his greens routes have about 10 years experience. "A first or second-year guy is not going to get a greens route," Sauls says.

Mark concurs, and at times takes it one step further by taking it upon himself to cut the cleanup route if his premier operators have the day off. He also runs an 18-inch reel on a 22-inch mower to disperse mower weight and cut down on the likelihood of scalping or wearing out edges.

"We have our best mowers cutting the cleanups every day so that we keep a good edge," Mark says. "When that guy goes on vacation, then I'll do it myself, or my assistants can still check greens mowers and tag along with the trailer and cut cleanup as they're checking mowers. We take that job pretty seriously because it's an area that really gets beat to hell, and people notice it." ■



Southern Hills Superintendent Russ Myers says he putts each green every day to see how little mechanical stress he can get away with.

Give 'Em What They Want

Golfers desire perfect greens. So what do superintendents need from a fertilizer to fulfill their desires?

BY LARRY AYLWARD, EDITOR IN CHIEF

The putting greens are where a lot of green — as in mucho dinero — is invested in the golf course. The putting greens are also where golf course superintendents are often graded for their agronomic abilities.

“His greens play just perfect,” is what a superintendent *hopes* Joe Golfer says about this course’s putting surface.

Obviously, fertilizer applications play a major role in how putting greens play. So how does fertility influence a golfer’s perception of putting surfaces? We posed that question to Mike Bandy, marketing manager of turf products for The Andersons.

“Golfers are looking for great greens — measured by rich color, high density and optimal green speed,” Bandy says.

OK, now that we know that, what do superintendents want and need fertility-wise to give golfers those great greens?

“They want their nutrition programs to create and maintain turf that is healthy and consistent, despite high traffic and the limitations in irrigation, labor and other resources,” Bandy says. “They also want products that are predictable, cost-effective, labor-effective, easy to apply, environmentally friendly and invisible to the golfer.

“That’s a pretty long list,” Bandy adds.

But not too long that Gary Grigg, an agronomist for Grigg Brothers, can’t add a few more things to it. Superintendents also want fertilizer that improves soil structure, contains less salt, has controlled and long-lasting color response, and has no or low ash content. And Grigg says superintendents also desire products that won’t stink up the place.

Obviously, fertilizer manufacturers have their work cut out for them to help superintendents appease golfers’ demands for everything Bandy and Grigg have listed. Of course, that’s what makes their jobs challenging.

As superintendents know, there are two ways to get nutrients into the plant — one is through the roots and the other is through the foliage. Despite which method superintendents prefer, they must keep some key things in mind when fertilizing their greens in their aim to provide the best putting surfaces possible.

Don’t flush

It’s when golf course greens are on the fringe of their demise that they pose the most remarkable putting surface, says Carmen Magro, senior agronomist and director of education and training for Floratine Products Group.

“Anybody who has been a superintendent knows that the best putting performance conditions are when the grass is literally on the edge of failure,” says Magro, a certified superintendent.

Alas, golf course greens on the ropes must be revitalized eventually. And this is where fertility programs come in. But be careful; it can be a tricky process. Even if your greens appear in the most dire of straits, be careful not to overreact. For instance, the last thing you want to do is fertilize for a flush of growth, Magro says. The most important thing is to meet the needs of the turf according to demands, such as the turf’s transition from winter to spring.

“If you flush the foliage with growth, not only can’t you keep up with the mowing, but ball roll will be affected throughout the day,” Magro says. “You don’t want any spikes in growth — not during the day and not during the week. Every nutrient works in balance with others. When all are balanced and at optimum levels, [superintendents] can manage through the toughest conditions the environment and their demands impose.”

The best fertility program is one that allows the turf to have what it needs at all times, Magro points out. Having greens on the edge is no exception. Magro says science reveals that flushes of growth, which are really nutrient peaks and valleys, are bad for the turf’s health. He says superintendents should also avoid fertilizing greens for a spike in growth and then quickly mowing it back. It might sound like a good thing to do to prepare for an important tournament, such as the member-guest, but it should be avoided.

Mike Sisti, marketing manager of fertilizer for Lebanon Turf, says fertilizer manufacturers have developed high-end fertilizer with excellent dispersion capability to offset flush-of-growth problems. He notes that growth surges in turf cause unevenness, which can lead to stress.

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a flush of growth.
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Sisti stresses that a smart agronomic approach to fertilization dictates the type of analysis fertilizer applied and when it's applied. Then color and healthy turf will subsequently occur.

To avoid the peaks and valleys of growth, superintendents have been trying to perfect spoon-feeding on greens. Chris Derrick, Agrium Advanced Technologies' technical product specialist, says spoon-feeding continues to be popular to achieve frequent light applications.

"You want to put enough out to supplement the turf and keep it green, and have it have a little bit of growth ... but at the same time not overload the system and the plant," he says.

Proper fertility on greens is akin to proper nutrition for the human body, Magro says. "The best fertilizer program in the world is one where we can apply exactly what the plant needs for a 24-hour period," he adds.

Of course, that's not easy to do in the real world of golf.

"It is logistically difficult to go out and spray a green every day," Magro says. "That's almost impossible, even at some of the high-end courses. But we can get pretty close to this nutrient-release pattern through scientific advances."

Other factors

Sisti says superintendents also desire fertilizer that is predictable and consistent. That's why he says Lebanon has invested a lot of time and research in its composite technology, which the company says produces a fertilizer that disperses quickly and cuts down on mower pickup, not to mention golfer complaints "that a granule of fertilizer stopped my ball from going in the hole."

Jaime Staufenbeil, an agronomist for Milorganite, echoes Sisti's statement that superintendents want to know they can rely on fertilizer to perform consistently.

"They want to know what's going to happen every time they put it down," she says, adding that a reliable performance and size are vital attributes of granular fertilizer.

Rick Geise, director of marketing and brand manager for Griffin Industries/Nature Safe Fertilizers, points out that consistency has everything to do with establishing a sound foundation for fertilization.

"Superintendents ask us to continue to deliver products that have the highest concentration of organic nutrition in the bag," Geise says. "In addition, we're asked to ensure that our products will deliver a predictable, consistent and complete release of nutrients. Ultimately, our customers want a nutrition foundation that will improve their overall IPM programs."

A big reason superintendents use soluble fertilizer is because it can't be seen once it is applied, says Derrick, the former assistant superintendent at FarmLinks Golf Club in Sylacauga, Ala. They also like tank mixing soluble fertilizer with pesticides. Also, nozzle technology has improved immensely for reliable applications.

That said, Derrick says dispersible granulars, which dissolve quickly to the point that they can't be seen, are growing in popularity with superintendents. Grigg says superinten-

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Give 'Em What They Want



Fertilizer manufacturers agree that color remains a big issue because golfers seldom tolerate a tan or brown putting surface.

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dents prefer granules with smaller SGN (size guide number) and a product that breaks down after one watering.

Milorganite's Staufenbeil, also a former assistant superintendent, says putting green color remains a big issue for superintendents because golfers want green — not tan or brown — greens.

"Golfers say, 'I don't care what the greens look like as long as they're fast,'" Staufenbeil says. "But I don't think that's true. ... Aesthetics still play a huge role in golf."

Sisti agrees and says managing color with fertilizer should not be underestimated. "Color is important, but you influence the color only so much based upon the variety genetics," he adds.

Sisti says another important factor is managing fertilization in regard to disease pressure. Disease can also affect color, he adds.

Fertility and the future

A teacher once told Magro, "The only way you can know where you're going is if you know where you've been." Magro believes the reflective statement applies to fertility programs.

"If we really want to maximize the benefit of foliar nutrition, we have to find the key component in every ingredient that is most beneficial to the plant," he

says. "And the key with that is to do more practical research and develop more products along those lines."

Magro knows "hormone" is a taboo word in the industry, but he believes more research is needed to discuss hormonal regulation in turfgrass.

"People don't like to talk about hormones when it comes to turfgrass," Magro says. "But let's call a spade a spade. If we have a turf plant growing in the rough and nobody is putting stress on it, that plant is regulating its hormonal balance on a continuous basis. If there's an environmental stress, the plant will reduce its foliage, absorb some energy down in its crown and wait until environmental conditions are better. Then it will switch the hormonal balance to start making the leaves grow again. The plant has a natural hormonal reaction to stress, which is induced daily in our world of turfgrass management."

Magro's point is that regulating hormonal balance can help turfgrass grow deeper roots and do what "we need it to do to survive our stresses," especially when putting performance is at its peak. "In the next 10 years, more work will be done on hormonal science and management than anything else in turfgrass nutrition," he predicts.

Grigg also mentions hormones when asked about research. "We see foliar-ab-

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Give 'Em What They Want

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sorbed nutrient sales increasing with the addition of more elicitors and phyto-hormones to increase plant health," he says.

Grigg also predicts future fertilizers will contain less or no phosphate as states continue to legislate against it. "As to granular fertilizer, we see the need [for research] for longer-lasting controlled response," Grigg adds.

Sisti says more work needs to be done to improve slow-release fertilizer.

"The industry doesn't have anything that's perfect right now," he says, noting that some slow-release fertilizers are immediate and others are slow to react. "More research in soil moisture, soil temperature and microbial activity could provide more clues to improve the slow-release technology."

Sisti would also like to see more research on fertility as it relates to common turf diseases on greens.

"If you can crack those nuts, that will certainly save the golf course superintendent a considerable amount of time, money and energy in how to manage those diseases," he adds.

Derrick also believes more research is needed to improve slow-release fertilizers. "The dispersible granulars are as good as the polymer-coated products," he says. "But coating in relation to longevity can be improved.

"We have a polymer polyurethane-coated fertilizer," he add. "How can we make it better and more durable? There's room for improvement. I think we can learn more from the pharmaceutical industry as far as slow-release technology goes."

From an organic standpoint, future technology should involve improving the basic technologies applied to animal nutrition, Geise says.

"There is a lot more money invested in animal feed technology as compared to turf science that is very applicable to soil and plant nutrition," he adds. "We feel we can continue to leverage this expertise to further enhance and improve our ability

to feed and stimulate microbial activity to then maximize fertility efficiency."

Geise also says competitive exclusion, which results when increases in beneficial bacteria populations translate to reductions in disease-causing pathogen populations, will be studied in greater detail.

Bandy believes research is focusing on three areas — overall plant health, environmental risk management and improved delivery methods.

"Better overall plant health can improve so many things about turf, such as resistance to stress, disease, insects and less-than-optimal-irrigation levels," Bandy says. "Much of this work will focus on taking more effective care of the root zone."

Bandy says management of risk to the environment and the work force will stimulate interest to create products that are more efficient and easier to apply, precisely and efficiently. Improved delivery methods of nutrients to the plant will result in similar benefits, particularly for granular nutrient products, he adds.

How low can greens go as far as height of cut? Staufenbeil says fertilization research should apply to that realm. More research should also be devoted to fertilizer to see how it can benefit turf root structure, she adds.

And with an increase in the amount of effluent water that golf courses are using to irrigate greens, Staufenbeil says research is needed to find out what role fertilizers play in managing greens irrigated with effluent. Staufenbeil also expects continued research into fertilizers that are safer for the environment.

Finally, Derrick hopes future slow-release fertilizers will also contain slow-release pesticides.

"Why not a combined granular that has an extended-release fungicide?" he asks. "In the future I think you'll see products that are easily incorporated into the greens and have a multitude of different releases of different fertilizers and pesticides.

"I'm excited to see them, but they could be years down the road." ■

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Soil sensor manufacturers say their technology will help superintendents better understand what's going on below the ground.

Makes Sens-ors

New technology gives information to help superintendents make better water-management decisions

BY ANTHONY PIOPPPI, CONTRIBUTING EDITOR

Water is the big issue for many golf courses, what with the belief among superintendents that one day there might not be enough of it for irrigation. But not according to Robert Criste, vice president of sales for Golflinx, a manufacturer of soil sensors.

"It's not a water shortage issue; it's a water management issue," Criste says, echoing the words of the other two companies — Advanced Soil Technology and The

Toro Co. — that also produce soil sensors for the golf industry.

Criste insists there is enough water, no matter what part of the country, if the water is used correctly.

To that end, the three companies have entered the golf soil-sensor market in the last three years with devices they say will allow superintendents to better understand what's going on below ground and ultimately lead to a reduction in water usage and pesticides as plant health increases. Joining Golflinx, an Australian company

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and manufacturer of soil sensors for the agriculture industry, is Advanced Soil Technology based in King of Prussia, Pa., and Minneapolis-based Toro, which purchased Turf Guard wireless technology in December. Turf Guard will remain based in California.

While the industry might be small and in its infancy, it is not without acrimony — AST has sued Toro for theft of intellectual property and patent infringement, to which Toro responded by denying the accusations and countersuing.

The technology works this way: sensors, about 1-foot long, are placed somewhere between 2 inches to 4 inches underground on various areas of the golf course to measure soil

moisture, temperature and salinity at a variety of levels.

The information is relayed back to a base unit via repeaters mounted on irrigation control boxes, allowing the superintendent to monitor each unit and the three categories of information it is sending back.

Since each sensor has multiple nodes, there is a multitude of information. The AST and Toro models are wireless and battery-powered and, therefore, can be repositioned. The Golflix model is wired into an irrigation pedestal and AC-powered.

Perhaps fewer than 100 courses around the country use sensor technology, but the superintendents at those courses say the information they are

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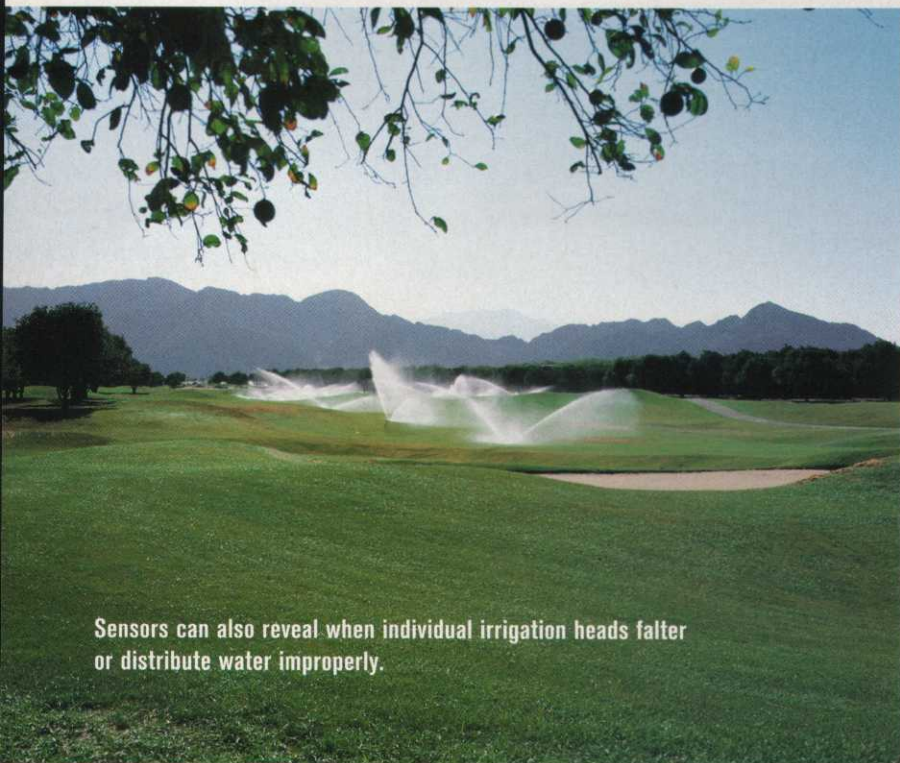
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Soil sensors can also be used on problem tees. As on greens, soil sensors can benefit microclimates where shade might influence irrigation.

Makes Sens-ors



Sensors can also reveal when individual irrigation heads falter or distribute water improperly.

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getting has led to substantial water savings and healthier turf.

David Major, the certified superintendent at Shady Canyon Golf Club in Irvine, Calif., has been using soil sensors for almost three years, acting as a test site for Turf Guard products (now Toro). The Tom Fazio-design, which sees more than 30,000 rounds a year, is built on poorly draining soil and is irrigated with effluent water.

"That's our biggest challenge in Southern California — reclaimed water and tight soil," Major says.

He has probes, 90 in all, placed in greens, tees and landing areas as well as a few unexpected locations. Major uses one probe to monitor the soil around a newly planted palm tree, and another floats in a holding pond to monitor water quality.

At the six-course Desert Mountain Golf Club near Scottsdale, Ariz., director

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Shawn Emerson, watching while Dr. James Beard examines a plug of turf, says sensors have enabled him to reduce water usage by up to 15 percent.

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of agronomy Shawn Emerson has AST sensors in place on his Geronimo Course. Since installing them, he says he has cut down on his water usage by 10 percent to 15 percent. Much of the savings has come from his reduction in water used for flushing of greens.

According to Emerson, because of the poor quality of his effluent, flushing greens to keep salts and other impurities from building up is vitally important for healthy turf.

Prior to the sensors, Emerson made sure to err on the side of too much water rather than too little when flushing his greens. The sensors, he says, not only allow him to monitor the accumulation of salt and let him know when to flush greens, but also let him know when the salt level has been reduced enough for him to stop the process.

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PHOTO BY: STUART BUCK

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"What I believe these things do is give you information that lets you make better decisions," Emerson says.

He has 24 sensors in use at Geronimo. The diameter of each sensor is smaller than a golf hole, so Emerson moves them around using a cup cutter.

The biggest surprise Emerson says he found once the sensors were in place is how much the soil conditions of his greens evolved depending on the season.

"What I believe these things do is give you information that lets you make better decisions. ... They don't replace observation, but they give me a heads up to look for things."

SHAWN EMERSON,
DIRECTOR OF AGRONOMY,
DESERT MOUNTAIN GOLF CLUB

"It changed dramatically during the year as the sun angles and shade angles changed," Emerson says.

Walt Norley, president and CEO of AST, said this is a prime example of what sensors do — provide superintendents with knowledge they would not otherwise have.

"It's information technology," he says.

Norley points out that most courses with poor-quality effluent water flush on planned cycles without knowing how much of the impurities have built up. Because water quality vacillates, sensors let the superintendent know

when it is time or, just as important, not time to flush greens.

The technology is not just for arid areas. Manufacturers say sensors can detect if pesticides and soil surfactants are present. And in areas of the country where rain is plentiful, soil sensors can prevent superintendents from irrigating when turf contains the correct amount of moisture.

"It gives me really good information on infiltration rates and leeching," Major says.

Because the sensors do not shut off, they will also reveal when individual irrigation heads are working improperly, putting out too much or not enough water.

David Angier, marketing manager of golf irrigation for Toro, says many courses start with a three-hole package of sensors, which is recommended by all three manufacturers as a good place to begin. Once superintendents become familiar with the technology and as their maintenance budgets permit, they can add more sensors in different areas.

The majority of the courses that have purchased the sensors are high-end and have bought three- or six-hole packages. A three-hole package, including installation, costs between \$15,000 and \$20,000 depending on the manufacturer.

Sensors are most commonly used in problem greens, tees and, for layouts that host tournaments, landing areas. The manufacturers say their sensors are compatible with any irrigation system.

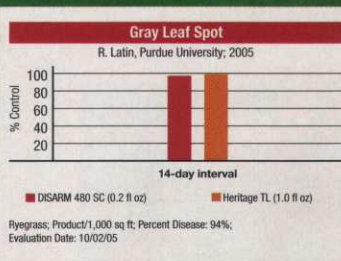
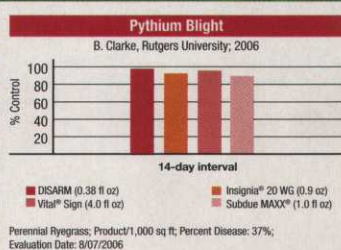
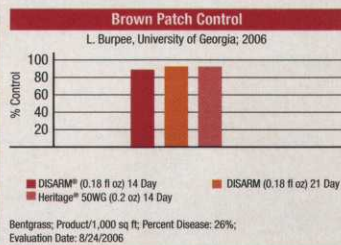
Manufacturers do warn that the sensors must be protected from aeration spikes, which would destroy the units upon contact.

As Emerson sees it, sensors are another weapon in his turf-maintenance program.

"They don't replace observation," he says, "but they give me a heads up to look for things." ■

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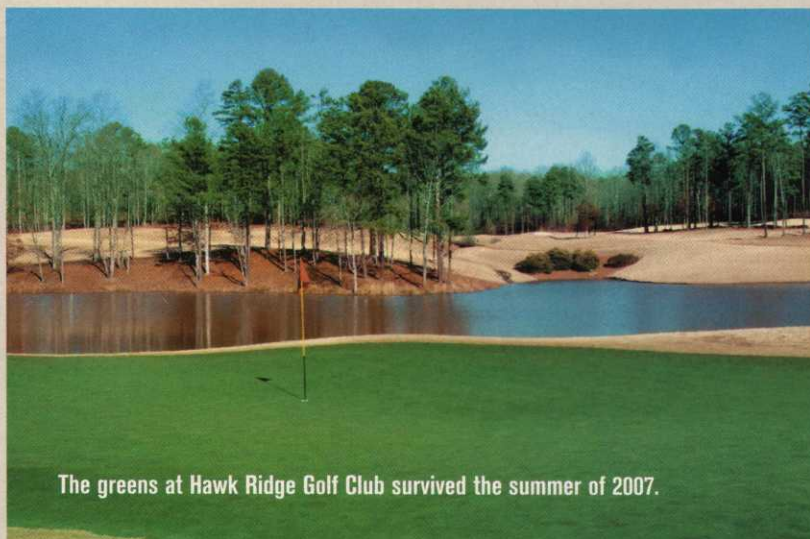


Arysta LifeScience

Harmony In Growth

One-Two Punch

Fungicide fights disease *and* energizes greens **BY LARRY AYLWARD**



The greens at Hawk Ridge Golf Club survived the summer of 2007.

While the fungicide Macdonald used halted the pythium, it was an added ingredient in the product that caused the turf to appear so vigorous. Macdonald was using Tartan, a relatively new fungicide from Bayer Environmental Science. Tartan contains a formulation technology called StressGard, which positively affects plant physiology and helps turf manage the stresses of golf course conditions more effectively, according to Bayer. Turf treated with StressGard develops greater root mass and top growth under heat stress, the company says.

Macdonald had heard about StressGard before from his distributor, who told him about turf trials involving Tartan. He told Macdonald the turf treated without Tartan — and the StressGard — didn't have nearly the same color and texture as turf treated with it.

Macdonald says he began using Tartan in 2006 when turf disease pressure was high

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Problem

In two words: heat and dry. Kyle Macdonald was worried how the Hawks Ridge Golf Club's bentgrass greens would hold up during a long, hot summer that saw very little rain.

Solution

A fungicide. A fungicide? Yes, but this fungicide contains a formulation technology that helps turf manage stress.

It was late August near Atlanta and as dry as the Sahara Desert. It was also feverishly hot, as it usually is that time of year in the South.

Hence, it was expected that the bentgrass greens at Hawks Ridge Golf Club in Ball Ground, Ga., would look a little toasty. But to Kyle Macdonald's surprise, the greens looked the same vibrant green in the dead of summer that they did in April.

"The color difference in the turf was amazing," says Macdonald, the club's senior assistant superintendent.

Macdonald couldn't believe that a fungicide he sprayed to control pythium could cause his course's greens to look *that* good at *that* time of the year. Incidentally, Georgia was going through one of its worst droughts ever at that time. Last year was Atlanta's second-driest year on record. The city received only 31.85 inches of rainfall. It receives 50 inches normally.



Kyle Macdonald says the greens at Hawk Ridge Golf Club looked the same vibrant green in August as they did in April.

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Real-Life Solutions



Macdonald (left) and his crew sprayed the greens enough that they received a healthy of StressGard. The day after the sprayings, Macdonald says the greens looked like they had been fertilized.

Continued from page 62

because of hot temperatures combined with heavy rain. He used Tartan alone and with Signature, another Bayer fungicide that also contains StressGard. Macdonald says he began using both fungicides in the same tank mix — 1.5 ounces of Tartan and 4 ounces of Signature — and spraying the greens every two weeks. Between two of those applications, he sprayed Tartan alone. Needless to say the turf was getting a healthy dose of StressGard.

Three days after the sprayings, Macdonald says the greens looked like they had been fertilized. He believes StressGard helped the turf offset heat stress.

"The past two summers, besides a stretch where we had 100-degree heat every day, were probably two of the best years we've had with bentgrass," Macdonald says of the club, a Bob Cupp design that opened in 2000. "The grass really responded well to what we were doing."

Bill Smith, superintendent of Panther Creek Country Club in Springfield, Ill., also uses Tartan and Signature and attests that it keeps turf healthy when weather conditions are rife for harming turf.

"We first used Tartan in the middle of August in 2006, soon after it came out," Smith says, noting he applied the fungicide to battle dollar spot and brown patch. "That time of year, the weather around here can be tough — 95 degrees during the day and in the 70s at night with high humidity. We face some intense disease pressure."

Smith says Tartan fought back the disease pressure, and the StressGard added more color to the greens, which were already in decent shape. Smith says he has combined Tartan with Signature for preventive control of pythium.

Panther Creek hosted an LPGA tournament last year, and Smith says he banked on Tartan to help him get his greens ready for the tournament. "We applied it to the greens one week before the tournament," he says. "I like the green color that [StressGard] provides. It's a great thing to have in a fungicide."

Macdonald agrees.

"We were just using it for disease control, but we really liked what the StressGard was doing," he says. "I'm not going to say it's a wonder drug, but it really did some neat things for us." ■