

PART TWO The Course And Conservation

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About This Series

Welcome to the second year of "Water Wise," our special series sponsored by Rain Bird and Aquatrols. As it was last year, our goal in this three-part series is to examine the world water crisis while educating golf course superintendents and other industry personnel on several aspects of irrigation.

Part two of the series examines the future of golf course design and renovation as it relates to water management. It also features a story written by golf course superintendent Christopher S. Gray Sr., who offers his peers the 10 things they can do *now* to conserve water on their golf courses.

Part three will examine the water situations in four U.S. regions. It will also feature results of a survey we've conducted with superintendents across the country on water issues.

Part one, titled "Irrigation Abroad," reported on golf course irrigation in other world regions, specifically Australia, the world's driest inhabited continent.

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Using Water **Intelligently** on the Course

Today, more people around the world are aware of the urgent need to use water wisely. It's true that we still have a long road ahead of us, but the efforts of many businesses, organizations and individuals have significantly heightened our society's overall level of consciousness about the importance of water conservation.

Each of us can make our own individual efforts to use less water — turning off the faucet while we brush our teeth, using more efficient appliances or installing a low-flow shower head, just to name a few. These types of choices are typically personal in nature; we may be the only ones who know we're making them. But for the people who manage the day-to-day operations of a golf course, their choices are very public ones, out there for all to see.

In the worldwide quest to conserve water, the lush, emerald-green fairways of golf courses are often easy targets for criticism. The truth of the matter is that many golf course superintendents and managers are leading the charge toward developing water-use strategies that keep courses in beautiful condition with less water than ever before. In fact, an author contributing to this installment of *Golfdom's* Water Wise Series is a prime example of a superintendent who's truly taken the challenge of using water wisely to heart — Christopher S. Gray Sr.

Gray, golf course superintendent and general manager of



Marvel Golf Club in Benton, Ky., was the recipient of Rain Bird's 2008 Intelligent Use of Water Award. Gray's efforts to find innovative ways to keep his course in top condition while using as little fresh water as possible are truly setting a new standard for other golf course managers and superintendents worldwide.

Under Gray's direction, Marvel Golf Club collects wastewater from houses in a nearby subdivision and uses it to water the golf course. The club also harvests rainwater during storm events and collects it for use in the irrigation system as well. In addition to saving water, Gray's course saves countless dollars in energy costs by not having to pump water from its ponds for irrigation purposes.

Gray has said that above all else, he considers himself a steward of the environment. He doesn't use water wisely just for the purposes of his golf course, but because he believes it's the right thing to do

— for his children's future and for the future of his community. Gray is providing an example for others to follow, and superintendents from courses across America have contacted him for suggestions on how to make their courses more water-efficient.

Gray has shown those of us who work in the golf industry how some hard work and dedication can make a huge difference. And that's what The Intelligent Use of Water is all about — each of us making choices at home, at school or at work that can have a cumulative, positive impact on our environment. As a provider of irrigation systems around the world, Rain Bird applauds Gray and others like him who have taken on this challenge, providing an inspiration for others to do the same. ■

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The Future – Ours to Influence

BY DEMIE MOORE

The future. What it will look like is impossible to tell because it depends so much on what happens between now and then, including what we do as individuals and as groups. The good news in this is while there are some things about the future that won't change and many factors affecting it that we can't control, we can still influence the future by our actions here in the present.

This applies as much to water and golf as it does to anything – and can be seen as both sobering and inspiring. There are some things that are not likely to change, at least in our futures.

For example, more people and improved standards of living will mean increased demand for limited supplies of fresh water and more policies regulating water use. Another example is continued rising costs for water, energy, labor and other materials.

There are many factors we can't control – the weather being one, how others use water being another, people's perceptions and the aforementioned policies being yet other examples.

However, there are quite a few things that we as an industry – and as individual members of the industry – can influence and even control by our actions now. Here, examples also include people's



perceptions and policies, which we can influence by our actions; and how much water we need and use, which is actually something we can control to a certain degree.

The sobering facts are the golf industry will increasingly be challenged to use less water more efficiently for a variety of reasons. The inspiring aspect of this is opportunities exist to meet those challenges. And those opportunities have economic and agronomic as well as environmental value to them.

In this issue, you'll get to read about some examples of how these challenges can be met in golf course design and day-to-day golf course maintenance. What is also key for the golf industry in meeting these challenges and favorably influencing the future is collaboration among all golf-related parties around the topic of sustainable water use on golf courses.

All together, from owners and architects, to superintendents and suppliers, to researchers and educators, to golfers and the industry of the game of golf – we represent many millions of people, acres and dollars.

If we work together to find ways – through design, technologies, management practices and public engagement – to show policy makers the value of golf and how efficiently water is man-

aged, we'll be able to reduce golf's overall water use and significantly influence the future of not only water availability for golf, but golf as a whole.

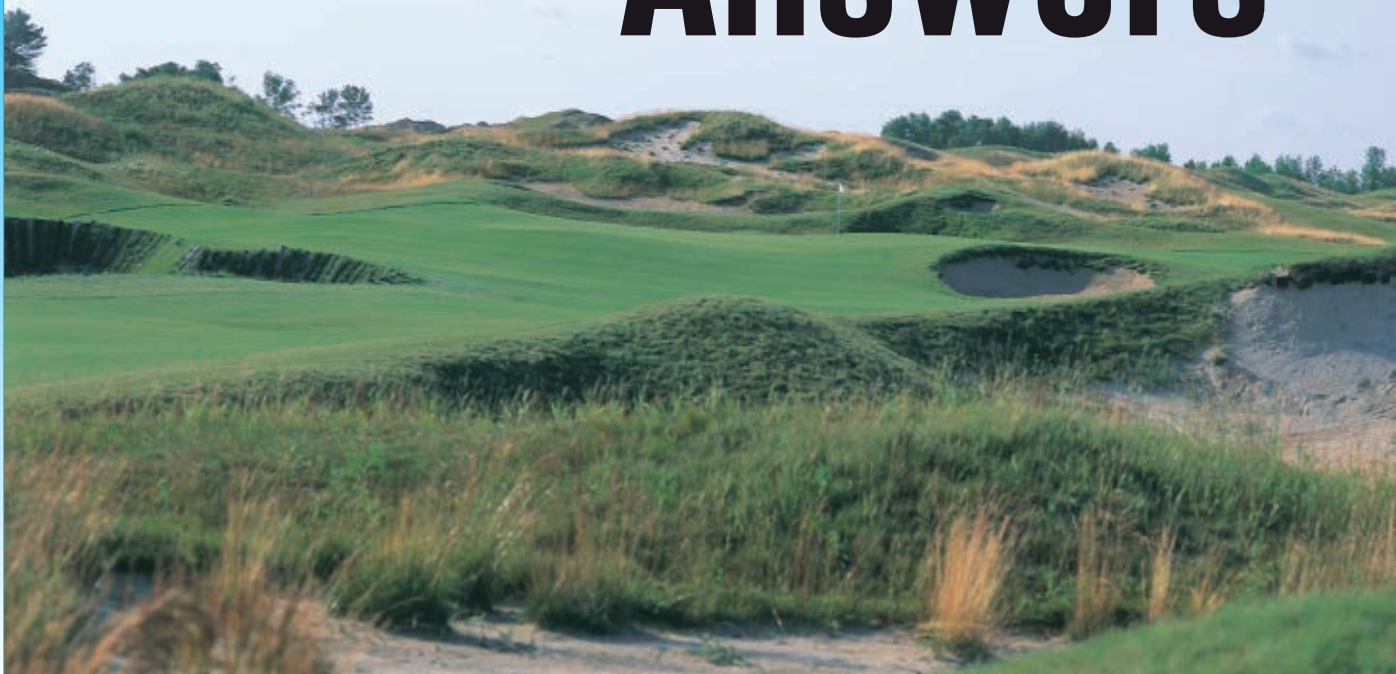
Aquatrols is proud to be part of this important process in a number of ways through research and product development on more efficient use of water in soils, and active involvement with initiatives of organizations like the Environmental Institute for Golf, Golf Environment Europe, the Irrigation Association and the Water Impact Alliance.

The future will be shaped by all of us. We look forward to working with more of you to have golf be, and be seen as, a good steward of water resources. ■

Moore is an Aquatrols Director, involved with Corporate Relations, Education and Training.



Architects Have Answers



**ENVIRONMENTALLY
MINDED GOLF COURSE
DESIGNERS KNOW HOW
TO CONSERVE WATER**

**BY ANTHONY PIOPPi,
CONTRIBUTING EDITOR**

WELL BEFORE AN IRRIGATION SYSTEM is powered up and the first head is close to popping up and turning, important decisions on how a golf course will maintain its turfgrass have been made. This dictum usually comes from the golf course's owner or members, but they don't reach the decision on their own.

Often times, it's the golf course architect who has the ear of the decision makers and is the one who can convince them that conserving water is the right road to follow, which does not diverge with the ability to create a great design.

"To me, it comes down to management expectations and that's an education process that begins early in the development process," says Michael Hurdzan of Hurdzan/Fry Environmental Golf Design in Columbus, Ohio, whose layouts include Erin Hills Golf Course in Erin, Wis., and Shelter Harbor Golf Club in Westerly, R.I.

PHOTO BY: MIKE KLEIMME



Whistling Straits (above) in Kohler, Wis., was designed by Pete Dye, regarded as the first environmentally conscious architect. Mike Hurdzan (right), taking a soil sample, says the trend is toward environmentally friendly golf courses.

PHOTO COURTESY: HURDZAN/FRY

It's then the architect can explain why grassing a layout with certain varieties is better for the environment and why irrigation heads from tree line to tree line are unnecessary.

"About every developer would like to build Augusta National Golf Club because it's the best-maintained golf course on the planet," says Hurdzan, who holds a doctorate degree in environmental plant physiology from the University of Vermont. "You can do that, but the trend is toward environmentally friendly golf courses."

Scottsdale, Ariz.-based architect John Fought has encountered the same sort of developers who equate lush and green with good.

"[It's] a little over the top," says Fought, whose designs include the Sand Hollow Golf Resort in St. George, Utah. "When I see a golf course that's perfectly manicured and green, I think, 'What's wrong?'"

The move to conserve water by irrigating smaller portions on a course

and maintaining conditions that are firm and fast is not new. Yet, developers and golfers still love green and soft, with water playing a big role in the process.

Hurdzan blames this in part on "celebrity golf pros with status," the ones who dabble in design at best but in reality merely attach their names to golf courses.

"They don't see the bigger issues," Hurdzan says, adding these golf professionals don't care or know how to push for ways to save water.

The celebrity designers are hired in an effort to have new designs noticed by the golf magazines that rank golf courses.

"They want to be rated in the top 100," Hurdzan says. "There are other ways to get in the top 100 other than the Augusta National look."

The drive to attain green and lush has sometimes reached ludicrous proportions.

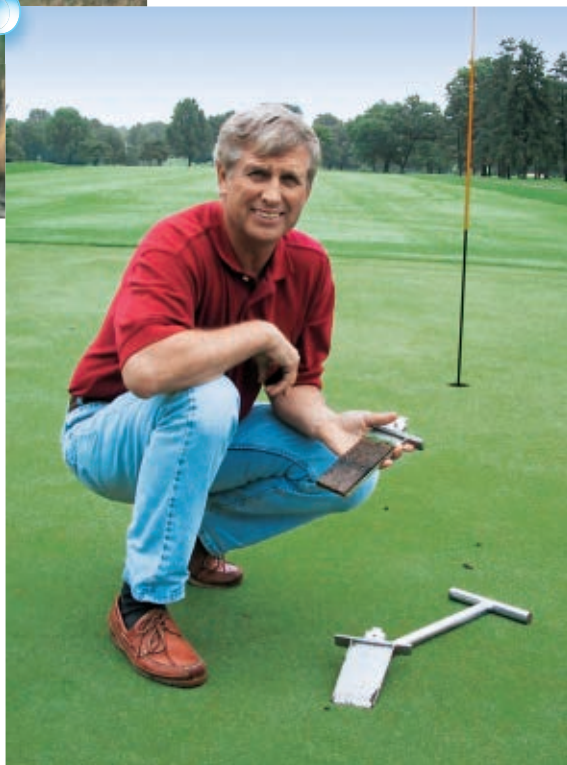
"I've had members take me into the deep rough and under a tree and ask me why the grass isn't perfect," says architect Brian Silva, whose designs include The Black Creek Club in Chattanooga, Tenn., and the Renaissance Golf Club in Haverhill, Mass.

As another example, Fought points to the trend of courses in the warmest areas of the country grassing their greens with cool-season varieties that require a ridiculous amount of water and maintenance to keep them alive. This is one opportunity for architects to enlighten clients.

"We want the owners to trust us, and we want to help educate them," Fought says. "Education is a beautiful thing."

That can mean explaining why not irrigating the entire golf course makes sense as does utilizing grasses that require less water to survive but might go slightly off color.

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Hurdzan says there can be trouble getting permits for a design requiring copious amounts of water because of water restrictions and shortages in many regions of the country. This creates a chance for an architect to enlighten a developer.

"[The architect] can manage the developer and manage his expectations," Hurdzan says.

At Naples National Golf Club, Hurdzan and partner Dana Fry produced a layout with only 50 acres of irrigated turf, implementing pine straw, native grasses and sandy waste areas. "You have to try and set obtainable goals," Hurdzan says.

Still, there are those who don't grasp the concept of firmer and faster and why turfgrass that isn't a deep emerald hue is a better playing surface.

"I get questioned on a daily basis, 'Why isn't this grass green? Why does my ball land on the green and bounce over?'" Silva says.

Fought says what's considered the "perfect" maintenance conditions are, in fact, just the opposite.

"We have to start to get people away from the idea that we have to have perfectly manicured greens all the time," says Fought, a former pro who was a two-time winner on the PGA Tour. "If it's 95 degrees every day and you don't have a little brown . . . my goodness."

Perhaps the first environmentally conscience architect is the legendary Pete Dye. Dye designed the Old Marsh Golf Club in Palm Beach Gardens, Fla., which opened in 1987, with a drainage and pump system that took all the runoff, including irrigation water, from the layout and directed it back to holding ponds.

Dye says he was not forced by regulators to recycle the water, but did it of his own volition to keep runoff out of the swamps that surround the layout.

"The Environmental Protection Agency thought it was the greatest thing since sliced bread," Dye says.

Dye continues

World-Traveling Architect Aims to Educate About Water Use

As director of design for IMG Golf Design in Cleveland, the majority of Brit Stenson's work takes place in the Far East, where water usage, quality and conservation are viewed in a much different light.

According to Stenson, because golf is so new to many of these regions, his goals are the most basic when it comes to irrigation.

"We try to do education, but more often we're solving a problem," he says. "How are we going to get it? How are we going to store it? How are we going to conserve it?"

"A lot of time, there's too much water," Stenson says. "In places like Singapore, drainage is the issue."

In other locations, there are extreme opposites. India, for example, has a well-defined, three-month monsoon season and nine months of drought. There, drainage, storage and conservation are all important facets of golf course irrigation.

In countries like the Philippines, Vietnam and Thailand, untreated water is often sent right back into streams, rivers and lakes. Stenson says golf courses could help with purification.

"One thing they should be doing is have developers build a package treatment plant," Stenson says. "The effluent water could then be used to irrigate the new courses, many that are capped with sand. It's a great way to be a final filter for treated effluent."

Stenson says he also regularly encounters owners and developers who want to landscape the courses with exotic veg-



Brit Stenson sees improved irrigation solutions overseas.

etation and an abundance of color that requires increased maintenance and lots of water, rather than having an environmentally friendly design. Stenson says he is seeing improvement in environmental endeavors, such as in northern China, where a massive reforestation project is under way. According to the United Nations Environment Program, South Korea and China lead the world's 20 largest economies in the percentage of economic stimulus money they invest in environmental projects.

Golf courses throughout the world need to look at alternate ways to acquire irrigation water, Stenson says. He points to the Ile-Aux-Cerfs Golf Course built on one of the smaller islands that make up the country of Mauritius off the southwest coast of Africa. For the Bernard Langer design, effluent water from a sugar cane plantation on another island is piped across the ocean floor to the course. "There's a lot of solutions besides putting a well in the ground and pumping it dry," Stenson says. ■

— Anthony Pioppi

to recycle water on courses he designs, including the Canyons Course at TPC San Antonio, scheduled to open in January.

Part of Dye's motivation in reusing and storing water is economic. As an example, he points to the fact that his design at the French Lick (Ind.) Resort didn't have to pump water up a steep hill into its holding pond this past season because the above-average rainfall and recycled irrigation water kept it at an adequate level. Other courses where he has incorporated reusing water to reduce irrigation output experienced the same economic benefit.

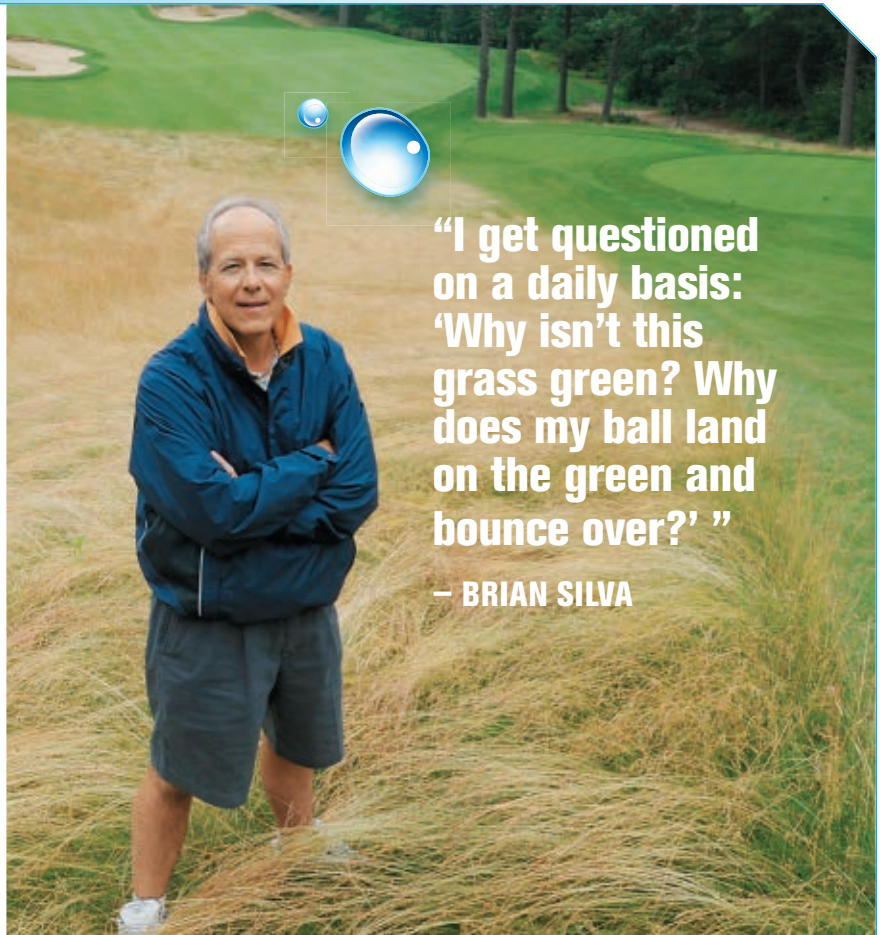
Dye is also proud of the Kampen Course at Purdue University in West Lafayette, Ind., where there was five years of constant monitoring of water coming into and leaving the property. Runoff from homes, gas stations and a nearby interstate that made its way onto the Kampen property had a water quality grade between two and four, depending on the time of year. After making its way through man-made marshes, holding ponds and the irrigation system on the course, it left the site rated with a grade much higher, between six and nine.

Where education and an appreciation of the environment don't work to convince owners and golfers to adjust their thinking, the current economic state might.

"It would be great in this difficult economic period if good things came from it," Silva says. "Maybe it will be that club members and golfers reconsider the levels of maintenance they expect."

A golf course that Silva renovated two years ago recently contacted him seeking his advice in its efforts to decrease water usage—and therefore expense—by 10 percent.

But Hurdzan says getting private facilities to change their maintenance regime in most cases is most always a



"I get questioned on a daily basis: 'Why isn't this grass green? Why does my ball land on the green and bounce over?'"

— BRIAN SILVA

battle. Other architects agree.

"When you go to an existing course or club, you have 300 people who know more about golf course architecture than you do," Hurdzan says.

Silva believes it's imperative for clubs and courses to develop a statement of purpose for course maintenance to guide future decision makers and give superintendents clear directions.

"I think it's been difficult for some clubs to follow up on the firmer and faster goals," Silva says. "The committee a superintendent works with one year is not the same committee three years later, and it's difficult to maintain continuity."

Silva puts the onus on the club to make sure superintendents know what conditions are sought and if the goal changes.

One way superintendents can help the cause is to convince their clubs to install soil sensors in greens, Silva

says, adding they provide a remarkably accurate measure of subsurface moisture and are an effective way to help reduce water usage. The science can be used to inform golfers that while the greens might not be as soft as they once were, the correct amount of water is being applied.

"Most people don't know how dry they can get their soil," Silva says.

The industry, with the assistance of architects and others, is improving the way it treats water. For instance, Silva says more clubs than ever have maintenance mission statements. "I never heard of that 10 years ago," he says.

Fought also sees an improvement in water conservation.


"Golf is doing a much better job," he says. "Change is afoot." ■

Pioppi is contributing editor to Golfdom. He can be reached at apioppi@earthlink.net.

Act Now

10 EASY THINGS YOU CAN DO TO
CONSERVE WATER ON YOUR GOLF COURSE
— *IMMEDIATELY*

BY CHRISTOPHER S. GRAY SR.,
CONTRIBUTING EDITOR



Gray is always thinking about conserving water.

WATER CONSERVATION seems to be getting a lot of attention. I, for one, say it's about bloody time! Perhaps the stark realization of the enormous obstacles our industry is facing when it comes to both the quantity and the quality of available water for golf courses is finally hitting home. With less water out there for consumption, reducing the amounts we need to sustain our golf courses is quickly becoming a top priority around the country.

The benefits of conserving water go well beyond just saving actual amounts of water. There are multiple trickle-down effects that go along with water-conservation programs, ranging from sharply reduced labor costs to significantly decreased energy use. And whether you're a superintendent at a high-end private course or a low-end public course, everyone uses water and will need to find ways to lower the amounts used on golf courses.

With that in mind, here are some simple and inexpensive things you can do now to help conserve water on your golf course.

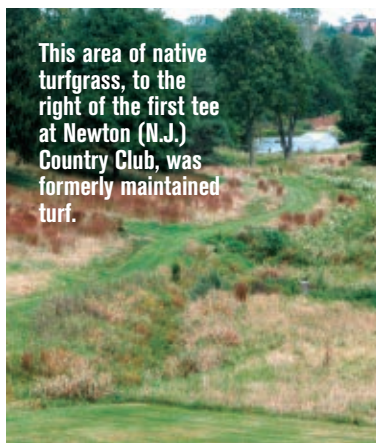


No. 1 Check Your Nozzles

Irrigation nozzles wear down over time, and most of us have likely not inspected them regularly . . . or ever. These nozzles are also the key to the distance the head ultimately throws the water, which probably hasn't been measured since its initial installation. In many situations, replacing worn nozzles and making sure the proper nozzles are being used will save massive amounts of water.

No. 2 Reduce Your Turf Areas

Simple logic here — reduce your maintained turf and you also reduce the amount of water needed to maintain that area. Not exactly rocket science, but I think you get the point. Convert an out-of-normal play area to a naturalized area and there's no need to irrigate it beyond establishment. What constitutes an out-of-normal-play area may vary depending on which golfer you ask.



No. 4 Change Irrigation Risers

Quite often, full-circle risers are throwing water in areas that really don't need any. Heads that run near the golf course perimeters are particularly guilty of this. By investigating these areas, you can see if you're accidentally irrigating the parking lot or nearby pond. A quick change-out with a part-circle riser will correct this water waster.

No. 3 Maintain Your Irrigation System

We all get irrigation weepers at times. We all, however, don't always fix them right away. We should. Proper maintenance is absolutely critical to water conservation. The potential to waste large amounts of water is greatest from irrigation systems that aren't repaired and maintained. Put simply: If it's broke, fix it.

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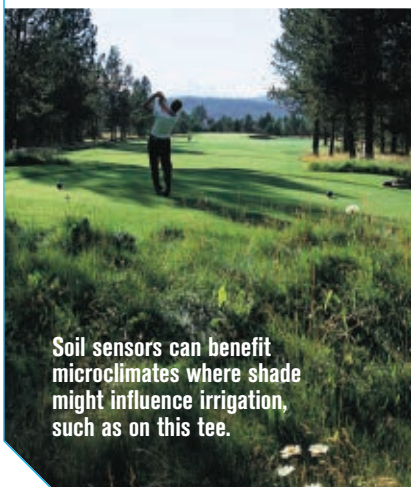
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No. 5 Use Wetting Agents

No brainer. Using wetting agents will better distribute the water in the soil profile, keeping it from going dry. The biggest benefit of utilizing them on the greens is helping eliminate the costly need for hand-watering. That alone makes them ultra-valuable in your water-conservation program.

No. 7 Install Moisture Sensors

Moisture sensors are awesome technology that are just scratching the surface of their potential for golf course management. By receiving readouts from the sensors in the soil profile, you can make irrigation adjustments based on what's actually going on down there. While still in its infancy, soil-sensor technology is the wave of the future for golf course water management. But until competitive pricing make it more readily available for the 85 percent of golf courses still suffering from our economic downturn, see No. 8..



Soil sensors can benefit microclimates where shade might influence irrigation, such as on this tee.



No. 6 Increase Your Height of Cut

Think back to Turf 101 class, and you'll recall that taller grasses use less water than shorter grasses. It's all about leaf tissue. Sometimes making a small adjustment in your height of cut can yield huge water savings in your irrigation programs. I'm not even talking about your green height, which would likely never happen anyway. Fairways and rough are the largest areas where you can easily save water by slightly increasing the height.

No. 8 Harvest Rain and Runoff Water

With water supplies drying up quicker than capital expenditure budgets, we need to capitalize on the water Mother Nature sometimes sends us. While this may sound overly ambitious to many of us, often times it's simply a matter of rerouting or installing a few pipes to redirect the water to make it go where we want it to go. The key to success in harvesting lies in making gravity work for us, not against us.

No. 9 Use Soil Probes

Admittedly much less technologically advanced than No. 7, these easy-to-use, yet helpful tools have been around for years, supplying superintendents with the art behind the science aspect of moisture analysis. Every superintendent's maintenance cart should include one of these.

No. 10 Educate Your Golfers

Communication is always good, and with water conservation, it's one of the best tools you have at your disposal. Keeping your golfers informed about your course's water situation can proactively help you with any potential problems that might arise. By including them in your conservation activities, you will likely be gaining an ally in your continued fight. ■