

While the irrigation lake at Rim Golf Club is full in this photo, it can drop quickly, says the course's certified superintendent Justin Ruiz.

PART THREE

Is There Enough to Go Around?

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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 three of the series examines the water situations in four U.S. regions. It also features results of a survey we conducted with nearly superintendents across the country on water issues.

Part two of the series, which ran in November, examined the future of golf course design as it relates to water management. It also featured a story written by golf course superintendent Christopher S. Gray Sr., who advised his peers on how they can conserve water *now* on their courses.

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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Think Globally, Act Locally*

BY DEMIE MOORE

The headline of this column is one of my favorite lines — and certainly pertinent to the focus of the Water Wise series. For all of the big world and life topics, at some point it boils down to questions like: How does this affect me?; what can I do about it?; and, what will I do about it? I like the “think globally, act locally” guidelines in this regard.

Regarding wise-water use on golf courses — the first and third of the above questions can only be answered by us individually. However, answers to the middle question — What can I do about it? — abound for every and anyone who touches the golf course industry. Some of the answers have already appeared in the previous two issues of this series, and more will appear in this issue.

The challenge to each of us, as golf course superintendent, owner, manager, supplier, adviser and/or golfer, is to match the first question — How does this affect me? — with the second question — What I can do about it? — and then select some of the options and put them into practice (“act”) locally.

While I'm looking forward to reading about the issues faced by superintendents around the country, and the results from the survey (Thanks to all who replied!) — I'm also going to take this opportunity to mention something that many *Golfdom* readers can do (and some have done) that's fundamental to maximizing



irrigation efficiency on golf courses. That something is to take the Golf Irrigation Auditor course from the Irrigation Association (IA). Regardless of whether you take the exam and fulfill other requirements to become certified, just taking the course will provide you with information and skills that you can use to assess and help improve irrigation efficiency on any golf course.

While the course reviews principles of irrigation, which is useful even if you already know a lot of it, the real value is in learning how to conduct the audit to find out if the irrigation system is operating as intended. This is no judgment of designers, installers or irrigation managers — it's simply a good idea to check actual performance from time to time, and make adjustments to improve where possible. The water and energy savings that can be realized by increasing the efficiency of irrigation delivery can be astounding. Taking the IA Golf Irrigation Auditor course will further equip you to have those answers.

The (Certified) Golf Irrigation Auditor course will be offered again as a 1.5-day seminar at the Golf Course Superintendents Association of America's Education Conference (Feb 8, 9 — seminar 289-01) during the Golf Industry Show. In addition, a golf course association chapter, industry supplier or both can host the 1.5-day seminar (two full days if people also want to take the exam) through the IA, which

is very happy to work with you to make that happen. Those of us at Aquatrols who have taken this and other IA courses have found them very valuable for reinforcing and expanding our understanding of irrigation, and how to assess and manage efficiency. While our focus is primarily on water efficiency in the soil — this goes hand in hand, and is influenced by, irrigation system performance. We encourage you to find or host a Golf Course Irrigation Auditor course in your area(s).

Water is vital to life on earth and to golf; golf is great for life on earth and can be good for water, too. Being part of helping golf use water as efficiently as possible — from irrigation system design, performance and management to managing soil wettability — is providing a great service to a wide community.

At Aquatrols, we're pleased to be part of the total solution in many localities worldwide. We invite you to look at what you presently and/or in the future can do to contribute to golf being a role model for wise water use. Think globally, act locally. ■

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

* Attributed by some to Scot town planner Patrick Geddes in the early 1900s. Also claimed as original by various others in the 1960s and 1970s and is now popular as a bumper sticker.

 **Aquatrols**

 **WATER IMPACT ALLIANCE**

Giving Credit Where It's Due to Intelligent Users

All regions of the United States — North, South, East and West — have different geographic and demographic characteristics that contribute unique challenges to our country's water situation.

Regardless of where we live, it's imperative for all of us to stay the course and continue to practice the Intelligent Use of Water in our daily lives.

Certain states, cities and associations in these regions recognize the growing importance of water conservation, and they are setting examples for others to follow. Through its annual Intelligent Use of Water State of the Union Awards, Rain Bird Corp. recognizes organizations like these for their significant contributions to environmental improvement.

The latest recipients of these awards were announced at the WaterSmart Innovations Conference in October, and they're truly breaking new ground in the quest to use water wisely:

Indian Wells, Calif.

The City of Indian Wells, Calif., is making a major impact on water use by combining smart irrigation controllers and effective water management with the full recycling and reuse of its green waste. By using smart controllers to manage irrigation, the city's landscaped areas saved 6.5 million gallons of water in only six months. The

city also uses locally processed, recycled organic materials in these same areas instead of fertilizers that could negatively affect freshwater supplies.

Inland Empire Utilities Agency, Chino, Calif.

In the hot, dry Inland Empire region of California, 60 percent to 70 percent of all residential water is used for outdoor irrigation. To address this issue, the Inland Empire Utilities Agency brought together its member agencies and other regional stakeholders to form the Inland Empire Landscape Alliance (IELA). The IELA has spawned a pilot program that encourages residents to remove water-intensive lawns. It also offers free residential water-efficient landscaping workshops and recognizes innovative landscapes.

Missouri Botanical Garden, Missouri Department of Natural Resources, Metropolitan St. Louis Sewer District

The Missouri Botanical Garden has sponsored a citizen-driven initiative, the Deer Creek Watershed Friends. The goal of this initiative is to improve the Deer Creek Watershed, a 40-square-mile area that drains many of the small cities adjacent to the St. Louis metropolitan area. The organization's Deer Creek Clean-Up drew 571 volunteers who removed 4.87 tons (9,740 pounds) of debris. In addition,

the initiative has stimulated tremendous citizen interest and political support for addressing other watershed health issues.

San Antonio Water System/Conservation Department

The Conservation Department of the San Antonio Water System has created and continues to support a variety of initiatives to reduce outdoor water waste. In addition to developing a system for the reporting, enforcement and citation of "Water Wasters," the department offers a number of rebate programs that support the adoption of water-efficient landscaping by both residential and commercial customers. So far, the conservation department has helped city residents save about 1.3 billion gallons of water.

A Positive Impact

All four of these organizations have demonstrated that, with hard work and resourcefulness, it's possible to leave a tremendously positive impact on the world around us. Rain Bird commends these trailblazers and encourages others to follow their lead by making water awareness a priority in their own neighborhoods, cities and states. ■



Water, Water... *Everywhere?*

NO MATTER IN WHAT
REGION THEY'RE LOCATED,
MOST ALL GOLF COURSES
FACE SOME KIND OF
IRRIGATION ISSUES

In the **WEST**,

BY LARRY AYLWARD,
EDITOR IN CHIEF

YOU HEAR IT OFTEN: The West is running out of fresh water. Consider California, where many areas of the state import water from other places, such as Lake Mead and the Colorado River. But those supplies are diminishing.

Alas, what does the future hold for golf courses in a region that's drying up?

Mike McCullough, director of environmental and water resources for the Northern California Golf Association in Salinas, Calif., says golf course superintendents and other golf industry leaders better start thinking about the future of their water use or their won't be a future.

"You'd like to think people are thinking about it long term, but chances are they're not," McCullough says, noting that while areas of northern California receive up to 15 inches of rain a year or more, most of Southern California receives much less.

The passage of a bill in November by the California legislature will surely get them thinking about the future. It calls to reduce water use statewide by 20 percent by 2020. Groundwater supplies will be measured across the state for the first time. "Is this ideal? Absolutely not," McCullough says. "Is turf going to suffer? Yes."

But the good thing is the bill will stimulate thinking of how to save water, McCullough adds. "I've been encouraging people to start this kind of dialogue," he says.

For instance, maybe golf's leaders in California should talk about whether it's sensible to grow cool-season turf in areas that are consistently 100 degrees Fahrenheit during the summer.

"Could you get by with a species

a Need to Keep an Eye on Every Drop Used

that requires less input, less maintenance and less water, yet still be desirable?" McCullough asks.

Recycled water use is a good answer for golf course irrigation in California and other parts of the West. But it's not *the* answer. There are infrastructure issues and turning a recycled water plan into reality could take years.



McCullough: More people need to think about water conservation.

It's also possible to run out of recycled water. Just ask Justin Ruiz, the certified golf course superintendent of the Rim Golf Club in Payson, Ariz. Ruiz uses it to irrigate at the Rim, and it's not uncommon for the club's irrigation lakes to drop to a 30-day supply of water for irrigation. As a superintendent, Ruiz says, you're forced deal with it.

How does Ruiz deal with what seems like a constant challenge of having enough water with which to irrigate? "We know exactly how much water we're using at night, and we also measure how much water we put out by hand-watering," Ruiz says.

Why doesn't Ruiz have an abun-

dance of recycled water with which to irrigate? "We have a small town," he says of Payson, which is about 90 minutes north of Phoenix. "Because of the down economy, more people have left town. Because there are fewer people, less water is used."

McCullough believes California will blaze a trail toward water conservation. The state's new water legislation is the beginning of just that.

"Water use will be more transparent and there could potentially be a formula for how much you get," McCullough says. "If you exceed that amount, there will be heavy fines and you'll be the scorn of the community." ■

Forecast in the **SOUTH** Calls for More Effluent Water Use

BY LARRY AYLWARD, EDITOR IN CHIEF

TWO YEARS AGO, the Southeast experienced its worst drought in a century. Mark Esoda, certified superintendent of the Atlanta (Ga.) Country Club, remembers the drought well.

Last September, the Southeast experienced unprecedented rainfall. Atlanta was saturated for nearly a week, with some areas of the city receiving 5 inches of rain in 13 hours. Esoda remembers that weather phenomenon well, too.

"The lakes are full, and nobody cares about the drought anymore," Esoda said in October. "The Atlanta area has already surpassed its annual rainfall mark."

Climate change? Call it what you will.

No matter, water availability will continue to be an issue in Atlanta and the South, Esoda says. And much of it is because of the wacky weather.

"Right now, water availability is good but outdoor water-use rules will continue to be developed even though there is plenty of water," Esoda says.



Mark Esoda says water availability will continue to be an issue in the South.

In Florida, Rob Kloska, superintendent of the Jupiter Island Club in Hobe Sound, says availability is the biggest water issue there, especially for new golf courses. Kloska says the first questions asked to developers are: Where will you get the water, and do you have access to effluent sources?

Kloska has irrigated his course through a reverse osmosis treatment plant since 1998. Reverse osmosis is the process of extracting salt and other minerals from brackish salt water and converting it to irrigation-quality water. Kloska says Jupiter Island decided to build the \$1 million reverse osmosis plant because of soaring potable water costs and water

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In the **EAST**, Water is Plentiful But Superintendents Expect More Regulations

BY ANTHONY PIOPPI,
CONTRIBUTING EDITOR

THE SUBJECT "WATER ISSUES" is not one normally associated with the Northeast portion of the United States, where the average rainfall is between 40 and 46 inches annually and water quality, for the most part, is excellent.

Like everywhere else, though, how local and state governments view water usage is changing and golf courses will be, and are, affected.

At places like The Golf Club at Oxford (Conn.) Greens, a Mark Mungeam design that opened in 2004, the plan was to never touch the aquifer to irrigate. "For the most part, we rely on storm water to recharge our ponds," said superintendent/general manager Bryan Barrington.

Situated in the midst of a real-estate development, rainfall at Oxford Greens is first directed through a 300-foot grass swale, stone rip rap, then into a settling pond before spilling into the irrigation

pond. Barrington said the water quality consistently tests very high.

In drought conditions, Oxford Greens taps into the municipal water supply. Barrington says the last time the course needed to do that the cost for 5 million gallons was about \$10,000.

Barrington also grew in Red Tail Golf Club in Devens, Mass. While there, Barrington was constantly monitoring his water quality to make sure he had no impact on what flowed beneath his course.

Continued from page 35

restrictions imposed by the city's utility company. Kloska figured if the course manufactured its own water, it wouldn't be at the mercy of the utility company during droughts and wouldn't be affected by soaring water prices.

Kloska is right, and he expects more courses along Florida's coast to opt for reverse osmosis in the future, especially since the water-management district wants courses to stop using shallow wells.

Kloska and Esoda also expect more Southern courses to irrigate with effluent or recycled water. Coastal cities are discovering they can no longer discharge wastewater in rivers and the ocean, Esoda says. Hence, golf courses will become a market for them. "I can see this happening more in densely populated areas where there are limited resources," he adds.

Esoda says water quality is not an issue in his area, but he realizes superintendents in coastal areas can't say the same. Kloska has few water-quality issues, but some of the courses that use effluent have challenges, such as high phosphorus.

Kloska predicts new and old golf courses will continue toward using turfgrass varieties and plants that use less water. Kloska also believes smaller water-recycling systems are the future and will be used to irrigate courses.

The good thing about the slow economy is slower population growth, which equates to less development, which won't put a drain on water use in the South, Esoda says. "I don't see any kind of real increased growth rate through golf in Georgia and maybe even the Southeast for the next five years," he adds.

Kloska agrees. "The only positive about the economic slowdown is development has gone to zero, which means the need for more water has dwindled," he says. "But in five years, when the economy is rolling again and new homes and developments are being built, the issue will move to the forefront again." ■

Despite Water

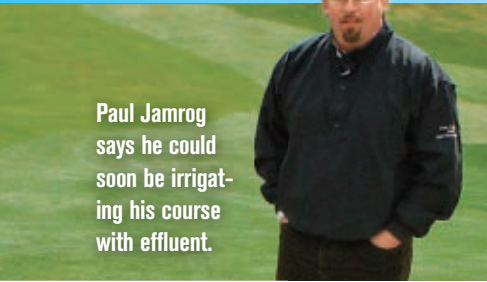
BY JOHN WALSH,
CONTRIBUTING EDITOR

JUST BECAUSE A GOLF COURSE is located in the Great Lakes region doesn't mean it's exempt from dealing with water issues. While availability usually isn't an issue, cost and quality are for some.

Even though the issues aren't as serious as those in the Southwest, superintendents in the Great Lakes region can't take the precious resource for granted.

The Lochmoor Club in Gross Pointe Woods, Mich., has unsuccessfully dug wells for years to find water. At one time, the club purchased all its irrigation water from the city of Detroit.

"We're unusual in the Detroit area in that we have to pay for water," says golf course superintendent Mike Mulkey. "We're only a couple miles from Lake St. Clair. The club tried to



Paul Jamrog says he could soon be irrigating his course with effluent.

“There was a laundry list we had to test for,” he says. “They wanted to know what was going into the ground. They also wanted to know what they had for a baseline.”

For Paul Jamrog, superintendent at Metacomet Country Club in East Providence, R.I., municipal water is how he irrigates but that could be changing.

Although Jamrog keeps the Donald Ross design dry and firm, the club was advised by the water district to seek an alternate source. Right now, Metacomet pays .0285 cents per cubic foot

of water along with a 7 percent sales tax. The cost is expected to rise dramatically when the municipal water infrastructure undergoes a massive upgrade and prices skyrocket to recoup the expense.

“Where do we go from here? It’s something that has to be addressed,” Jamrog says.

Metacomet tried drilling wells but that produced little water, and Jamrog estimates it would take 12 or 14 wells to keep an irrigation pond recharged. Part of the problem is the brackish Providence River runs right past the course and deep wells would most likely draw from the salty water.

Jamrog says there’s a possibility he could one day be irrigating with effluent provided by a nearby treatment plant.

“All this is going to come to a head in the next five years,” he adds.

Then there’s David Berard, the certified superintendent at Dorset (Vt.) Field Club, who gets water for his course from a 3-acre pond dug into a gravel aquifer that quickly recharges.

“It’s a wonderful pond,” he says, noting water quality is fantastic, only slightly high in pH.

Berard says other courses in south Vermont also irrigate from self-charging ponds. Berard, though, knows it’s a matter of time before regulations tighten in Vermont, where the state has legal control over all types of water, including aquifers. ■

Pioppi, a Golfdom contributing editor, is based in Middletown, Conn.

Availability in the **NORTH**, There Are Hurdles

get water from the lake but, politically, couldn’t do it because of municipalities and conservation groups that put the kibosh on it.”

In 2002, the club completed an \$800,000 project that comprised creating a large retention pond that ties to its irrigation pond. The retention pond was created to catch as much rainwater and snow melt as possible. The 12-million-gallon-capacity pond filled completely the past two winters.

“The 12 million gallons we save by collecting is worth \$60,000,” Mulkey says. “The cost of water has increased, and that was the main reason the club built the retention pond — to save money on water.”

Mulkey spends \$60,000 a year to purchase water from the city of Detroit. That amount of water, half of what he uses, is in addition to the 12 million gallons he retains from rainwa-

ter and snowmelt. “During a typical year, we would use \$120,000 worth of water,” he says.

The 36-hole Olympia Fields (Ill.) Country Club has plenty of water because it sits on an aquifer and is close to Lake Michigan. There are two wells on property and one recharges the irrigation lake. The club doesn’t pay for water, it just pays for the electricity to pump it.

But water-quality problems stem from road salt and debris in a creek that drains into a pond on the course used for irrigation. In the spring, a large amount of sodium accumulates in the pond. “We drain the pond, fill it up with well water and repeat the process,” says certified superintendent Sam MacKenzie.

In 2007, the South golf course was renovated. Planning the project, the architect wanted to tie the pond to

the 13th and 14th holes via the creek. MacKenzie recommended diverting the creek around the pond to create a wetlands area that would filter the salt and debris before it entered the creek. In the end, the creek couldn’t be completely diverted, so some of the contaminated water still enters the pond. That said, the sodium content of the pond the past two springs has been cut in half. ■

Walsh, a Golfdom contributing editor, is based in Cleveland.



Mike Mulkey says his club saved money after building a big retention pond.

Survey Says

More Superintendents Aim to Irrigate More Efficiently



POLL ON WATER USE ALSO REVEALS THAT ONE-THIRD OF GOLFERS DON'T CARE ABOUT WATER CONSERVATION ON GOLF COURSES

**BY LARRY AYLWARD,
EDITOR IN CHIEF**

GOLF COURSE SUPERINTENDENTS are much wiser when it comes to watering these days.

A whopping 97 percent of superintendents say they're taking measures to manage water more efficiently on their golf courses, according to a recent irrigation survey by *Golfdom*. The survey, conducted in mid-October, garnered nearly 500 responses from superintendents across the country.

The answers to the first question of the survey — “Are you doing all you can to manage water as efficiently as possible?” — reveals superintendents are more serious about reducing their water use than they were in past years. Fifty percent of superintendents said they're finding ways to reduce overall water use, even if it causes occasional stress on the turf. Forty-seven percent of respondents said, “Somewhat, we're trying to find the right balance.” Only 3 percent of superintendents said they were “watering away to attain as green and lush turf as possible.”

We conducted a similar survey in 2006, and the difference in answers between now and then is significant. Back then, only 25 percent of superintendents said they were managing water use as efficiently as possible, and 65 percent said they were try-

PHOTO BY: MIKE KLEMM

ing to find a balance. Almost 10 percent said they were watering away for the lush, green look.

Our survey also found that most superintendents — 66 percent — say it’s “very important” to have a sound water-management program at their golf courses.

But superintendents might have a long way to go in convincing golfers about the importance of water conservation. When asked, “How do your golfers feel about water conservation on the golf course?” only 16 percent of the 465 respondents said, “They think it’s very important.” Thirty-one percent of respondents said, “Golfers don’t care.”

Obviously, superintendents, as well as others in high-profile positions at golf courses including general managers and green committee members, must get on the education front to get more golfers to care.

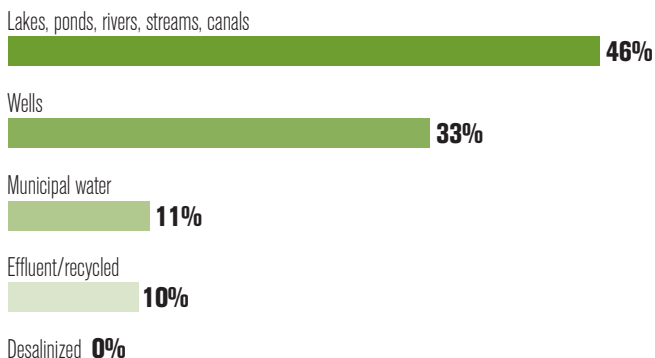
Surprisingly — or maybe not — most superintendents aren’t concerned about increased water costs or decreased water quality when it comes to their biggest concerns about their water use. Most superintendents are mainly concerned about increased scrutiny of their water use, obviously by non-golfers.

Our survey also found that only 26 percent of superintendents said they’ve conducted an irrigation audit to discover how they can be more responsible water users. Why haven’t the remaining 74 percent conducted an audit? It’s easy to assume, especially in a cost-cutting economy, that those superintendents think an audit costs too much. But 77 percent of superintendents said they haven’t done irrigation audits because they’re not sure what’s involved or how to go about it.

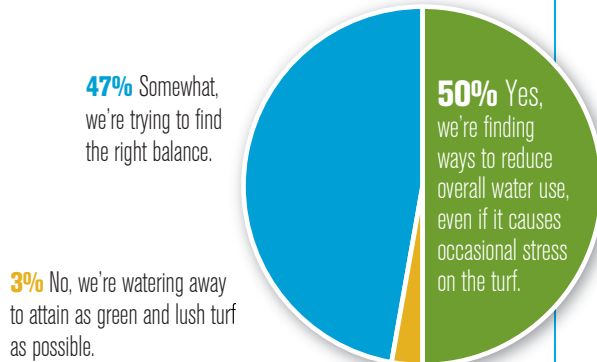
Sounds like an opportunity for irrigation consultants. ■

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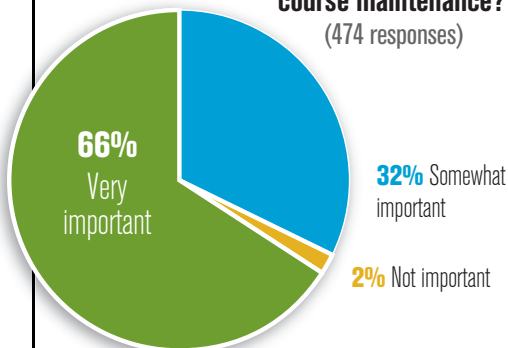
What is your primary water source? (465 responses)



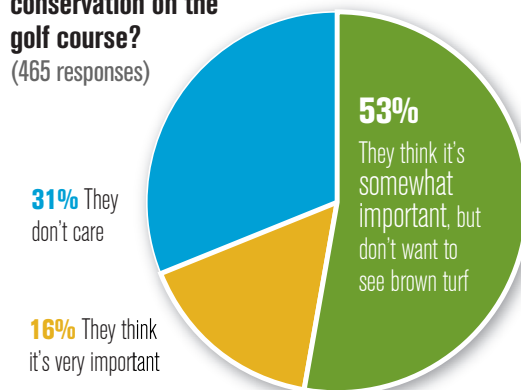
Are you doing all you can to manage water as efficiently as possible? (474 responses)



Where does a sound water management program, including an effort to conserve water, rank on your priority list when it comes to golf course maintenance? (474 responses)

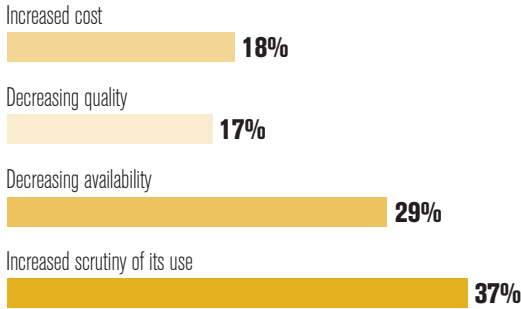


How do your golfers feel about water conservation on the golf course? (465 responses)

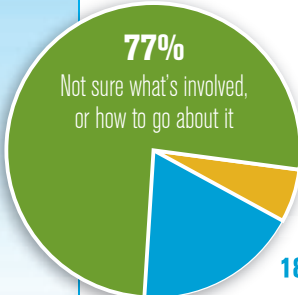
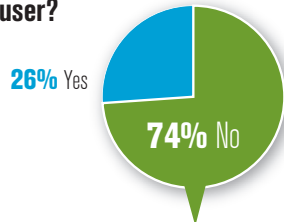


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What is your biggest concern regarding the water you use for golf course irrigation?
(462 responses)



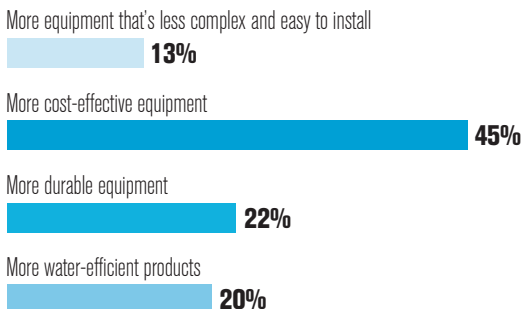
Have you done an irrigation audit on your course to discover how you can be a more responsible water user?
(465 responses)



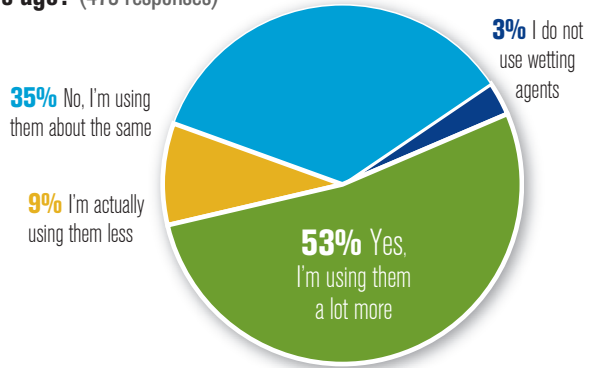
What is the primary reason for not doing an irrigation audit? (345 responses)

18% It's too costly
5% It takes too much time

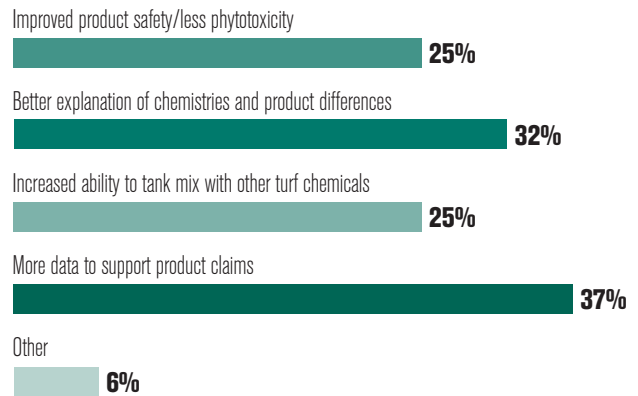
What improvements would you most like to see from irrigation equipment companies?
(472 responses)



According to a recent GCSAA study, 92 percent of superintendents use soil wetting agents to conserve water. Are you using soil wetting agents differently than you did five years ago? (473 responses)



What improvement would you most like to see from soil surfactant companies with regard to their products?
(473 responses)



What area would you most like to see irrigation equipment companies improve on? (470 responses)

