

PINPOINTING DEFICIENCIES

Irrigation audits reveal superintendents may need to change nozzles, adjust throw and hand-water to improve uniformity. BY JOHN WALSH

Only about 8 percent of 18-hole golf facilities nationally had their irrigation systems audited by a certified irrigation auditor from 2001-2005.

Uniformity.

That's the key to effective and efficient irrigation. It's what all superintendents strive to improve, yet they don't always have the time to make that improvement.

An irrigation audit, or catch-can testing, is a common method of measuring distribution uniformity. Some superintendents perform audits on their own; some hire consultants, although consultants usually perform a larger evaluation, focusing more on an irrigation system's hydraulics and controls.

Only about 8 percent of 18-hole golf facilities nationally had their irrigation systems audited by a certified irrigation auditor from 2001-2005, the most recent years for which there's data, according to the GCSAA and Environmental Institute for Golf's "Water Use and Conservation Practices on U.S. Golf Courses" report.

Andy Slack, president of West Coast-based Spot Water Management, says some superintendents know irrigation, some think they know irrigation and some don't know irrigation at all.

"Many don't have the time or the expertise to spend analyzing their irrigation system, so they would rather hire an expert," Slack says. "The guys who are insecure try to do everything in house. Those who are more secure in their jobs want an objective opinion to confirm what they think."

If a superintendent wants to conduct audits frequently, it doesn't make sense to hire Slack. However, an evaluation is different.

"With an evaluation, I look at parts of the irrigation system, such as the hydraulics and the control system," he says. "Superintendents don't always have adequate knowledge of those areas."

"I've learned doing a catch-can test isn't worth the time or effort," he adds. "If you know irrigation, you should be able to look at the turf and estimate the distribution uniformity within 5 percent. Catch-can tests, which aren't very valuable, look at the driest 25 percent. I'd put money toward hydraulics and the control system instead."

Jason Green, superintendent at San Jose (Calif.) Country Club, hired Slack to do an audit and evaluation of the club's irrigation

system. Previously, he hadn't done any audits in house.

"We needed an audit to set a benchmark for future benchmarks and an overall check of the system," he says, adding that uniformity was good at 81 percent but Slack's evaluation exposed some pressure issues.

Brian Vinchesi, president of East Coast-

based Irrigation Consulting and past president of the Irrigation Association, conducts many audits (putting cups out and testing sprinklers) and evaluations (checking the entire irrigation system). Many times, Vinchesi is called to verify, via a report, what a superintendent is telling a club's board: It needs significant repairs to the irrigation system or



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it needs a new one.

Facilities perform audits for different reasons, such as to document a problem, justify a new system or help with scheduling. The benefit of an audit is it provides actual data, not theoreticals. An audit provides the exact precipitation rate and targets distribution uniformity.

An audit performed on all 18 holes is rare because it's time consuming, expensive and unnecessary, Vinchesi says.

"Once you've done it, the results won't change a lot," Vinchesi says. "However, if you're watering all your greens with the same equipment, water still is put down differently. If you do an audit yourself, do part of the golf course, such as the greens."

Many superintendents see the process done by a consultant and then start doing it on their own, Vinchesi says.

A distribution uniformity of 70 percent and higher is a standard goal. Michael Dukes, associate professor and irrigation specialist at the University of Florida, says superintendents want to be in the 70- to -80-percent range. Above 85 percent is exceptional, he says.

AUDITING BY THE NUMBERS

Percent of golf facilities that have conducted an irrigation system audit

By facility type

Public	6%
Private	11%

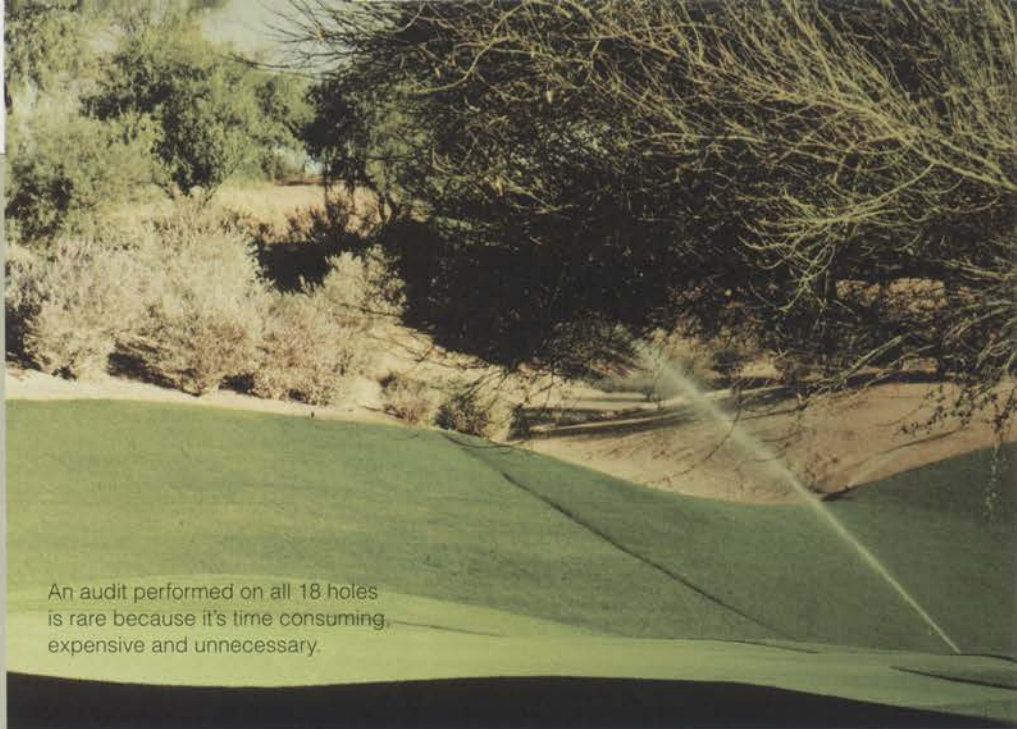
By maintenance budget

<\$500,000	5%
\$500,000-\$999,999	8%
\$1 million+	16%

By agronomic region

Southwest	15%
Southeast	11%
Northeast	7%
Pacific	7%
Transition	7%
North Central	5%
Upper West/Mountain	5%

Source: The GCSAA and Environmental Institute for Golf's "Water Use and Conservation Practices on U.S. Golf Courses" report



An audit performed on all 18 holes is rare because it's time consuming, expensive and unnecessary.

For a consultant to audit just greens costs just less than \$10,000 and takes about three days, Vinchesi says. To do the whole course, which is rare and Vinchesi has never done, costs about \$25,000.

Vinchesi recommends superintendents focus on the trouble spots. The most common problem he sees on golf courses is that sprinklers aren't level or are too low.

"Everyone worries about spacing," he says. "If slope is a problem, it's an install issue. If they're too low, it's a maintenance issue. Some superintendents are good about keeping sprinklers at grade; others aren't."

Vinchesi helped the Governor's Club in Durham, N.C., improve its irrigation efficiency 13 percent by auditing all its greens. The club ended up replacing sprinkler heads to achieve that efficiency.

NO MATTER THE AGE

Even though Gozzer Ranch, a private, 18-hole club in Cor d' Alene, Idaho, opened in 2007, superintendent Jim McPhilomy, who worked with consultant Erik Christiansen to design the irrigation system, looks at the young system closely all the time. In fact, he has three crew members who spend all their time on the irrigation system.

McPhilomy and his staff focus on the microclimates throughout the course. Some areas are surrounded by pine trees; others are wide open.

"It's harder to determine all the microclimates during construction," he says.

Gozzer Ranch was sand capped – 9 inches in most places, 12 inches in others – and the areas that have 12 inches of sand dry out faster. So McPhilomy adjusts run times or changes nozzles to improve uniformity and

avoid creating wet spots.

McPhilomy has deep roots in irrigation. His father, who had a keen interest in irrigation, was a golf course superintendent for 25 years. After that, he became an irrigation consultant in the early 1980s. McPhilomy worked with his father performing catch-can tests at a time before the newer control systems came to market.

"It was a great learning experience for me," he says.

Even though Gozzer is a new golf course, there's still a need for McPhilomy to do catch-can testing.

"We're using catch cans to see where we should change nozzles or increase or decrease the distance of throw," he says, adding that the sprinklers are spaced 65 feet apart.

When performing a catch-can test, McPhilomy recommends using a minimum of 20 cans and as many as 35 for a 2,000-square-foot area.

"Most guys are aware of the need to improve irrigation uniformity," he says. "We all talk about it. But it's hard to find time to do. I want to do it based on my experience with my dad. It's good education to check the theories we learned about in school."

The main reason McPhilomy performs audits is uniformity.

"Everything we do is based on irrigation uniformity," he says. "It affects fertilization, compaction, disease pressure, surface wear, etc. The more uniform and the fewer wet and dry areas we have, the better."

With a new course and irrigation system, superintendents have a somewhat false sense of reliability.

"When a system is installed, there's a sense of, 'Hey, we paid X amount of money

to have this system designed and installed, so it should work right," McPhilomy says. "But that's not always the case."

The intentions are always right, but what if the architect moves a bunker after the irrigation system has been installed? That, in turn, affects uniformity because the sprinklers need to be moved. The superintendent needs to fix problems areas around bunkers or large greens. Steep slopes factor in, too.

"There are some things that aren't thought of during the design phase," he says. "That's when the superintendent comes in to manage those areas."

HAND-WATERING

Even with the help of an audit and moisture meter, sometimes hand-watering is inevitable, says Larry Stowell of San Diego-based PACE Turf. A moisture meter and a virtual irrigation audit help diagnose irrigation distribution problems, but unfortunately, they don't correct the problem.

"Only hand-watering will overcome the deficits of circular head-to-head design limitations," he says.

A soil-moisture meter and virtual irrigation map help superintendents communicate some of the problems they encounter trying to maintain uniform and dry turfgrass conditions.

"Without periodic rainfall to even out the soil-moisture profile, it's impossible to deliver the ultimate in dry, fast turf conditions without supplemental hand-watering," Stowell says.

For Green, hand-watering the 100-year-old push up greens at San Jose is a must because of the high clay content in the soil.

LEARNING MORE

If superintendents want to learn more about audits, they can attend seminars put on by the Irrigation Association or GCSAA.

"Many times it's difficult to get enough superintendents to

attend the irrigation audit seminar at local meetings, but it's a hit at the Golf Industry Show," Vinchesi says.

"I like superintendents to do it on their own because they learn a lot more," he adds. "It's just time consuming. It's more visual than reviewing numbers. There's really no drawback for superintendents to do an audit on their own. Credibility can be an issue with boards because they seem to want to pay someone to do it."

Green's assistant has been trained as an irrigation auditor, so Green will rely on him to audit the irrigation system regularly and hire Stack every other year for evaluations.

Despite all the irrigation system improvements during the past 25 years, irrigation still comes down to uniformity.

"We're still at a disadvantage because of physics," McPhilomy says. "I'd like to see a sprinkler head that puts down water more uniformly, but I don't have the answer." GCI

John Walsh is a freelance writer based in Bay Village, Ohio.

For information on the Irrigation Association's recommendations for irrigation audits, visit the July Online Extras section at golfcourseindustry.com.



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