Nothing on the course is more valuable — and regulated — than water, and superintendents don't want it trickling through their fingers

Precious to the Last Drop

Water Watch

If only irrigating a golf course was as simple as spelling H-2-O. Instead, superintendents often find themselves torn between babying their bentgrass and obligating their enablers.

There's the electric company, handing out penalties to anyone caught hogging all the juice during the a.m. crunch.

There's the waterman, demanding that a minimum amount of effluent be used each week.

There's the conservationist, measuring overuse of the good stuff by the thimble.

And there are the ever-present golfers, ready to hit the links, sans live sprinklers, at daybreak.

"The modern superintendent serves many masters," says Jeff Kiewel, the national sales and marketing manager for Rain Bird's golf division.

In the meantime, near perfection is expected of the superintendent in the quest for flawless playing conditions. Accomplishing that in the northeast United States is difficult enough; doing so in the more arid parts of the country represents survival of the wettest.

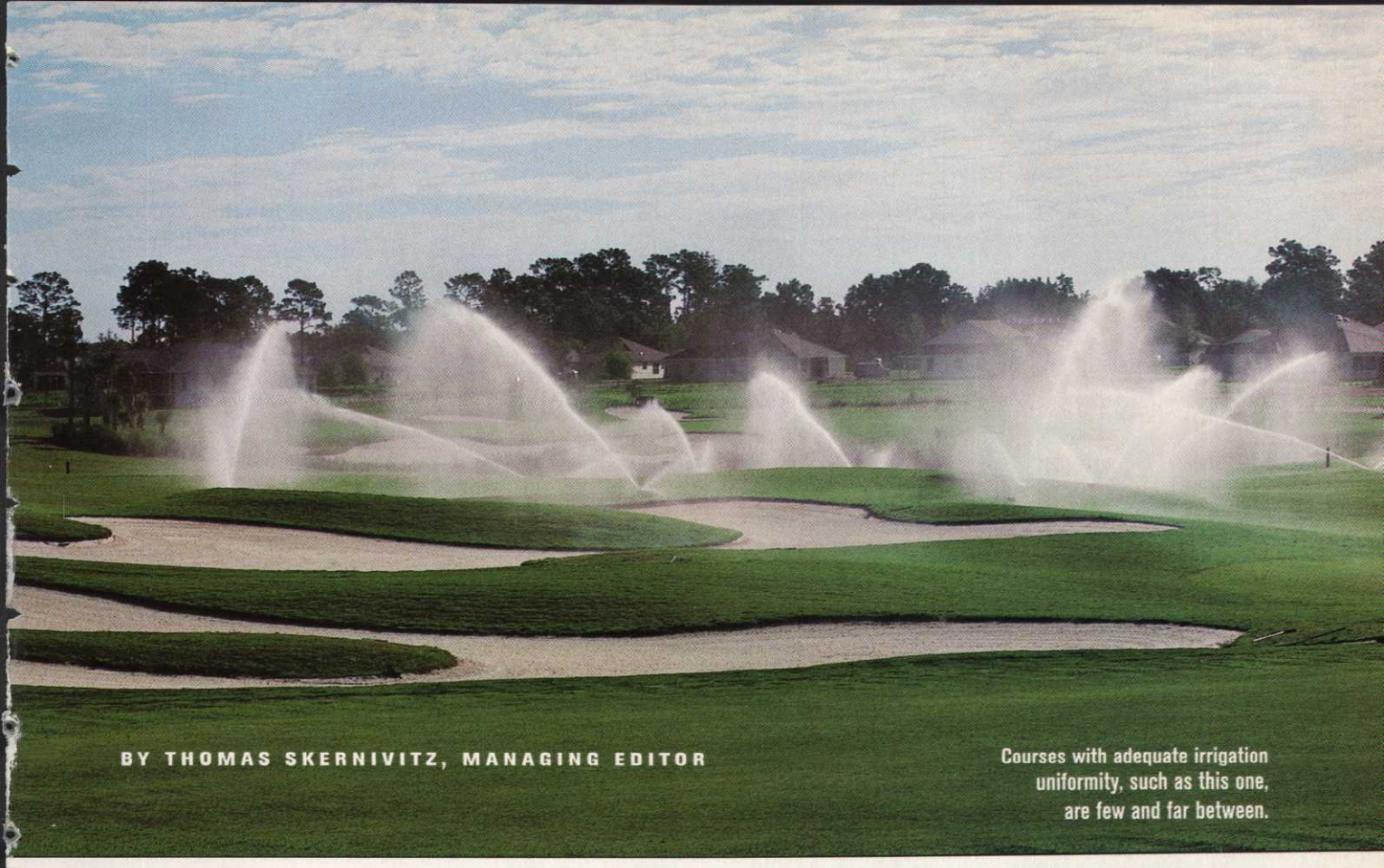
"Irrigation management is the most crucial part of our operation. It's probably 80 percent to 90 percent of what makes a good golf course a good golf course in Arizona," says Ernie Pock, the superintendent at Grayhawk Golf Club in Scottsdale, Ariz. "If we can manage our water, we can produce a very good playing surface."

Are clubs succeeding? In terms of irrigation uniformity, a primary determinant of waste, they are not, according to the American Society of Irrigation Consultants (ASIC). Independent consultant Jim Barrett, citing ASIC data, says the majority of U.S. courses have uniformity figures in the 50s and 60s rather than the acceptable level of 80 out of 100.

"(Scores of) 50 and 60 are terrible; a terrible waste of water, a terrible waste of power," says Barrett, the president of James Barrett Associates Inc., based in Roseland, N.J. "You need as uniform coverage as you can have and as efficient a system as you can have. The good superintendents are very concerned with precision of irrigation."

Checking the list

The first step toward improving water management is to have an irrigation system evaluated about every five years by a third party,



BY THOMAS SKERNIVITZ, MANAGING EDITOR

Courses with adequate irrigation uniformity, such as this one, are few and far between.

PHOTO BY: JIM BECKER/EPIC CREATIVE COMMUNICATIONS

such as a certified golf irrigation auditor (CGIA). An audit can do one of two things: 1) reveal simple changes that may lead to upgrades in the system's performance and efficiency; or 2) produce a cost-justification analysis for the superintendent wishing to replace or upgrade the irrigation system.

Differentiating between complete system renovation and upgrading is vital to the bottom line, considering a new system ranges between $700,000 and $2 million, while replacing sprinkler heads and their controllers can be a third of that cost.

"Audit costs are very reasonable, especially in light of the fact that they usually easily pay for themselves through system operating cost savings, not to mention improved course playability," says Rich Dunn, the golf rotor product manager for Hunter Industries.

CGIAs set their own rates, and costs are usually based on the number of valves or controller stations covered in the audit. A standard audit lasts one or two days and averages about $2,500. A more detailed audit can include a return on investment analysis that can be valuable when presenting a proposal to club management.

"For capital improvement, I think (audits) are a very important tool," Pock says. "They're more for when you have to go to your owners and have to say, 'Hey, our irrigation system is wasting water,' or, 'Our irrigation systems aren't as good as they could be. Here are things we can do, and this is the audit that's telling us to do this.' "

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ERNIE POCK, SUPERINTENDENT, GRAYHAWK GOLF CLUB

Some of the common conclusions of an audit pertain to:

■ **Sprinkler nozzles** — After about 10 years, the efficiency of a nozzle deteriorates to the point where replacement should be considered. "It's not an insignificant expense," Kiewel says. "Depending on the number of heads, it could cost thousands of dollars to do a full nozzle replacement, but that's a lot cheaper than replacing your whole [irrigation] system."

Less expensive still, a system can be replaced one section of the course per year.

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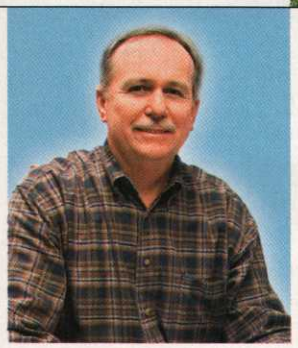
Look in the Mirror

Golfdom columnist Joel Jackson says all water woes will continue until individual homeowners and municipalities abide by the same standards they push upon small-niche users such as golf courses. See page 20.

An audit of an irrigation system can determine if sprinklers are properly spaced.

PHOTO COURTESY: HUNTER INDUSTRIES



"Audit costs . . . usually pay for themselves through system operating cost savings."

RICH DUNN,
GOLF ROTOR
PRODUCT MANAGER,
HUNTER INDUSTRIES

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Some courses replace the heads around their greens and use the old sprinklers on the roughs. "Every single golf course in the United States has areas that can benefit from a new sprinkler that has adjustable trajectory and arc along with an optional back nozzle," says Toro Irrigation Sales Manager Bill Thornton.

■ **Nozzle location** — Closer spacing is a good thing as well, says Thornton. He recommends a separation of 60 feet to 65 feet in areas where water is tight. "This allows more even coverage and better control of water. It is very misunderstood in the industry: More sprinklers equals less water used."

■ **Sprinkler differentiation** — Water requirements for the green differ from the area around the green, Thornton says, so back-up sprinklers should be utilized around the greens. Separate systems for rough watering should also be considered. "If water shortages arise, this offers choices on where to cut back use and still maintain some playability," he says.

Command central

As drought conditions become more prevalent and as the price and quality of water move in reverse directions, new and improved versions of computerized central control systems, which originated about 15 years ago, are becoming a necessity, Kiewel says.

"Irrigation management is becoming more and more complicated every year," he says. "So, the real ball game on upgrades is control. Do you have enough control to put the amount of water where you need it and when you need it?"

With effluent water being pushed on courses, water placement becomes increasingly critical. One misplaced sprinkler, and the dissolved solids in effluent can ruin a green's complexion. In turn, the fertilizer or fungicide that will be needed to remedy the situation burns a hole in the course's budget.

"You need to have enough control of the system," Kiewel says, "to make sure that a) you don't have any overspray on the green from some other place, and b) you can measure the use of the system so you can essentially pump out all the effluent water from the system before you start irrigating the greens."

With myriad groups dictating a watering schedule, a control system offers clock-like precision along with documented records.

"As there becomes more layers, the superintendent needs a better brain to help him optimize his systems," Kiewel says. "Let's say there are a dozen programs that run overnight to irrigate a golf course. Well, the central control will go out and find out which heads are available to be turned on, and it turns them on and runs them. The pump station runs most efficiently wide open, so you wind up using the least amount of electricity. And it's constantly doing the math and keeping a record of all of this, so if someone wants to come in and say, 'Did you use effluent last night?' I'm going to have a report that says, 'Yeah, here it is. These programs ran the effluent. They ran at this time. This is the amount of water I put down.' "

Central control systems consist of a central control unit and controllers, or satellites, which cost about $5,000 to $6,000 apiece. The more sprinkler heads a course features, the more controllers it will need.

"Controls are all above ground, so your primary cost is the cost of equipment," Kiewel says. "We're seeing more and more people

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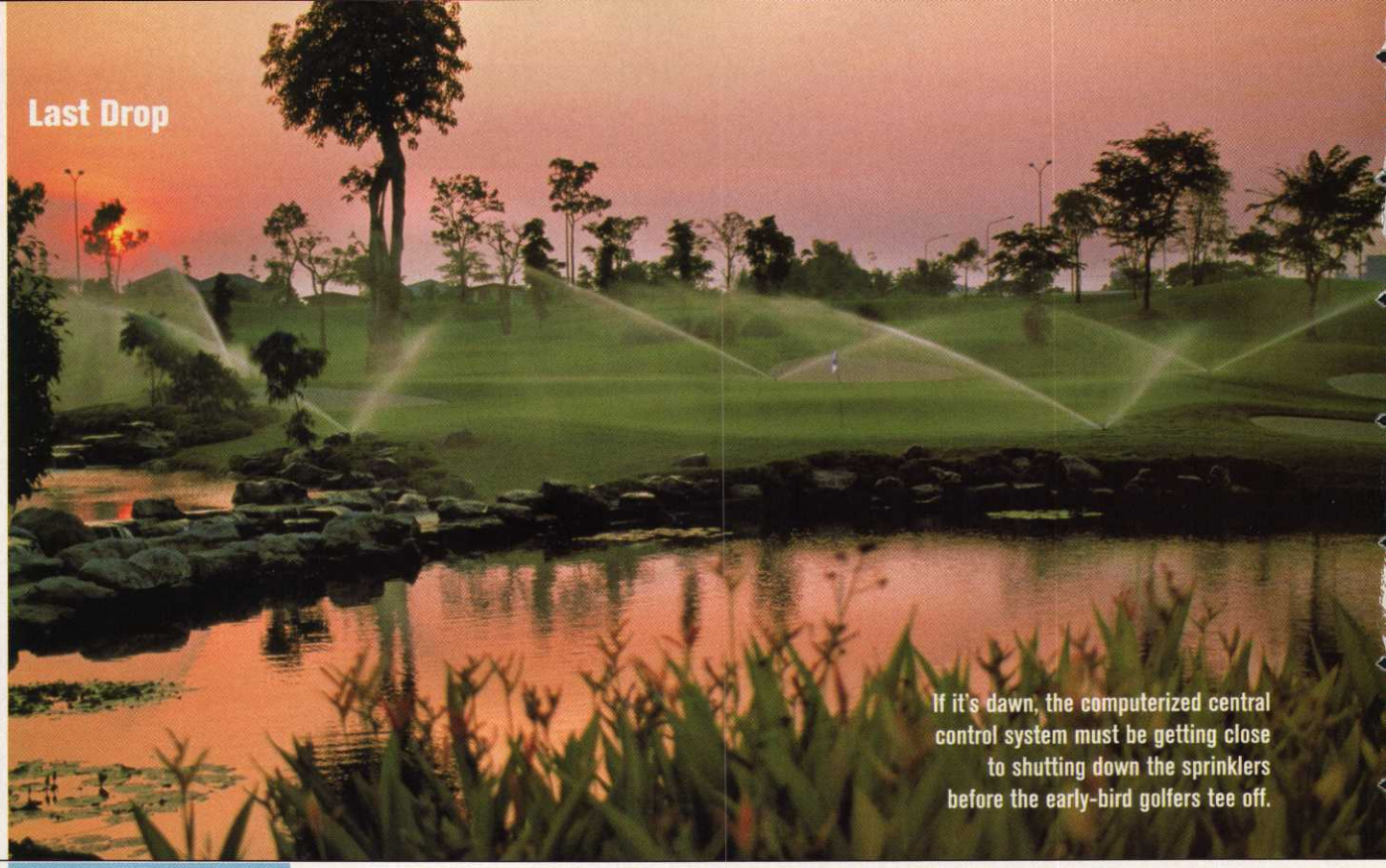

If it's dawn, the computerized central control system must be getting close to shutting down the sprinklers before the early-bird golfers tee off.

PHOTO COURTESY: TORO

"We're seeing more and more people . . . doing control upgrades . . . so over a five-year period, they have a new system."

JEFF KIEWEL, NATIONAL SALES AND MARKETING MANAGER, RAIN BIRD GOLF DIVISION

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who are satisfied with their (current) irrigation designs. So they're doing control upgrades. Or they're doing all of their satellite controllers this year, and next year they're going to do centrals. And then they're going to start doing rotors — the greens, the tees and then the fairways. So over a five-year period they have a new system."

Keen observations

Even without an audit, superintendents can easily spot indications of wasted water on their own, according to Dunn. A similar course might be using dramatically less water or pump station electricity. And wet areas or excessive run-off might be present at the same time adjacent areas are too dry.

Useful tips to prevent waste include the use of:

- **Hand-held radio controls** — "With the new palm pilots they're coming out with, you're actually able to take that central computer and take it right out onto the golf course," Pock says. "That's where you really start fine-tuning your irrigation system. We can get it to the point where we know exactly when the golf course is going to get hot the next day. It can be that precise."
- **Accurate records of costs and weather** — "Tracking weather during the year can let you compare year-to-year weather, with costs," Thornton says. "These figures can be valuable to begin justification discussions."
- **A quality camera with a date stamp on the image** — "This can help ID the problem areas and measure progress over time," Thornton says. "Photos of playing conditions, repairs and condition of system components can be valuable."
- **Experimental plots** — "If you have cultural practices or watering schedules you want to test, pick a part of the golf course you can experiment with and test your theories," Thornton says. "Perhaps the practice range has similar conditions to your fairways. You could try cutting back watering until you notice conditions are diminished. Dial in the schedule, then roll it to other parts of the course."
- **Soil probes** — "Moisture beyond the root-zone is not available to the plant," Thornton says.

Technology aside, a superintendent's experience and intuition are invaluable, according to Pock.

"You can't rely on proper water management just by sitting in front of the computer," he says. "You have to physically still go look at the golf course, and that's how you'll make your adjustments on the central. We're more or less high-tech farmers, but you still have to look at your golf course and make your decisions there." ■