



# 'Bread' and Water

## An irrigation upgrade could save your course money in the long run

BY CURT HARLER

**W**hether your course is blessed with 44 inches of annual rainfall or scrapes by on 4 inches a year, your use of irrigation water will be regulated. Irrigation is a big economic factor in many course budgets.

Superintendents at courses in Nevada and New York found that keeping close rein on water use not only is economically rewarding, but environmentally satisfying, too.

Las Vegas-based Shadow Creek Golf Course saved 76 million gallons of water, or 223 acre feet, in 2003 by implementing a series of improvements. "Every day I look at the grass. Every night I turn down or turn off the system, depending on what I observe," says Shadow Creek superintendent David Diver.

In Rochester, N.Y., Rick Holfoth took a more gradual approach to upgrading the irrigation system at Irondequoit Country Club. It paid off, both in water use and professionally. Holfoth took a system that was limping along with irrigation efficiency factors like 41 percent on the No. 3 fairway and

49 percent on the No. 11 tee to a uniform 89 percent on the No. 12 fairway.

"That proved the money spent on No. 12 was a good investment," Holfoth says.

Two good things came out of the improvement on No. 12:

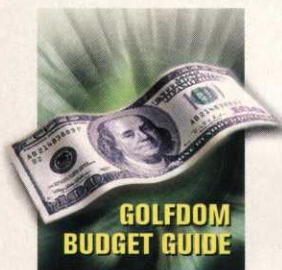
- First, Irondequoit decided to go ahead and upgrade the other 17 holes.

- Second, partly based on his work at Irondequoit, the Country Club of Rochester hired him away last year and made one of his first tasks upgrading its irrigation system.

The bottom line: Better management and a better system will smooth out irrigation water usage, even in tough moisture times.

"The ratio of average-to-peak irrigation cycles is directly related to the operator of the irrigation system: the superintendent," states Mike Brownell, water resource scientist with the federal Susquehanna River Basin Commission (SRBC) in Harrisburg, Pa. Even in an area that normally sees 42 inches to 44 inches of rain a year, golf course water use ranges from 50,000 gallons to 830,000 gallons of water per day — or 147 million gallons per year.

MIKE KLEMM



## How they did it

Shadow Creek, built in the late 1980s, is a 300-acre island of green surrounded by 30,000 trees in the middle of the desert. It is lush. At no point on the course can a player see another hole from the one he is playing. It's easy to forget you're in the Nevada desert.

Last summer, Shadow Creek was closed for six weeks to tear out the old heads and upgrade the fairway irrigation system. The roughs and tees are being addressed this year, and tall-grass areas will be addressed in 2005.

Diver's irrigation strategy is built on accuracy of spraying, efficiency of water application and constant monitoring to see what the system is doing.

One of his first steps was to move to gear-drive heads from impact heads. "I now know that each head makes a rotation in two minutes," he says. There is no variation caused by pressure differences or worn parts.

He knows that a 180-degree head will apply one-eighth of an inch of water in six minutes and that a 90-degree head will take three minutes.

Diver is picky about his irrigation audits, using catch cans to see how efficiently and uniformly water is applied. He goes through the exercise on tees, fairways and greens.

The course uses a mix of Rain Bird, Toro and Hunter equipment. All irrigation data is entered into a global positioning system (GPS) and plotted by computer. The maps it develops show exactly how water is applied and allow Diver to correct problems before much water is wasted or turf is damaged because it didn't receive enough irrigation.

At the same time the course replaced the irrigation system, it replaced 30 acres of fairway turf, going with a 419 bermudagrass purchased from an Arizona turf farm.

In December 2002, Shadow Creek used 440 million gallons of water. In

December 2003, that figure was down to 364 million gallons — a savings of 76 million gallons.

## 'Driving' irrigation

Holfoth likes to compare irrigation systems to cars. Back in the 1970s, cars were powerful but not too efficient. Today, there is less power but more efficiency. Good irrigation systems are like that, too, he says.

Years ago, Irondequoit installed a single-row irrigation system fed by a 700 GPM pump. "It was the best system in Rochester in the '70s," Holfoth says.

The system featured single-row valve-in-head sprinklers. Irondequoit draws from a creek and the Erie Canal. By 1988, course officials realized it had problems with the system, though. Like most courses, cash was tight, so officials wanted to make the system more efficient and extend its life.

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In 1990, they updated the control system to solid-state timing and central control. In the early '90s, they converted the greens to a valve-in-head system. In 1993, officials retrofitted the pump facility, and between 1994 and 2000 they replaced fairway sprinklers.

The cost to extend the life of Irondequoit's irrigation system for 10 years was not cheap. The course put \$150,000 into pumps and a pump building. Upgrades to the controllers cost \$75,000. Installing additional couplers cost \$30,000, and the course spent another \$30,000 removing sprinkler heads from the greens.

"The upgrades bought us 10 additional years of life on the system," Holfoth notes. "But the course did not address issues of coverage, uniformity, leaks, sprinkler failures and high labor costs. It was one big Band-Aid."

In 1997, the course built a new prac-

tice facility with triple-row irrigation on precise spacing. Gear-driven sprinklers with good pressure control boosted efficiency.

The new facility's irrigation system convinced everyone that the time had come for a total upgrade for the system on the course and modifications to its ponds for irrigation water storage. One pond in particular was made 30 percent larger and its depth doubled.

The upgrade was a major success. "The new system gave us 15 percent to 20 percent water savings," Holfoth says. "From 2001 to 2002, we covered 20 percent more irrigated turf and realized 15 percent net-water savings."

Water use dropped from 19 million gallons to 15 million. If that sounds good, keep in mind that 2002 was a severe drought year.

Holfoth credits the USGA turf advisory service and the USGA Green Section's David Oatis for providing the fig-

ures that helped convince club members to make the sizable investment required.

### Pressure from above

Superintendents like Diver and Holfoth made changes because they knew it was the right thing to do, both for their clubs and for the environment.

There are regulations on surface water and ground-water withdrawal and consumptive use throughout the United States. In Nevada, a golf course that exceeds its water budget by 1 percent to 20 percent will pay a surcharge amounting to three times as much for its water. Use more water over the budgeted amount by 21 percent to 40 percent and the price is five times more. Using more than 40 percent over the budgeted amount means the cost is nine times more.

"The price of water is going up, and it will escalate rapidly," says Doug Bennett, conservation manager for the Southern Nevada Water Authority (SNWA).

There are carrots, however. SNWA will provide up to \$300,000 per course to make landscaping changes that save water.

Some water districts set percentage-reduction targets for water conservation. Both Bennett and Brownell agree they are unfair, penalizing the club that already does a good job and not really cracking down on the club that is wasting water.

Brownell recalls a course in Pennsylvania that SRBC slapped with a \$35,000 penalty because it had not made a \$5,000 change to measure permissible water levels for its irrigation draw-down.

"Storage is the most important thing when you operate a self-supplied irrigation system," Brownell says, adding that superintendents should plan for peak withdrawal times, not for averages.

Both Diver and Holfoth agree. Each would be quick to tell other superintendents that a sound irrigation plan will pay off — both in dollars and in common sense. ■



The advertisement features a laptop computer on a green background. To the left of the laptop is a close-up image of green grass. The Syngenta logo is in the top right corner. Below the laptop, the text "Green turf. Great rewards." is written in a large, white, serif font.

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