

Is It Time For An Irrigation Upgrade?

BY FRANK H. ANDORKA JR. MANAGING EDITOR

Here's the experts' step-by-step program for a system overhaul

The ever-increasing water window eventually tipped Ryan Fisher off that his old center-row irrigation system needed to be replaced. Fisher, certified superintendent at The Woodstock Club in Indianapolis, says it took his system — originally installed in 1983 — 14 hours per day to irrigate his nine-hole executive course. Even with that amount of time, water and energy, the edges of the fairways would burn, rimming the otherwise impeccable course with a border of brown grass.

Armed with a report prepared by an irrigation consultant, Fisher appeared before the green committee to make his case for a system upgrade. The board eventually approved a three-phase program that will be completed in 2005. The first phase, done this year, included upgrading the computer and satellite systems.

"We weren't being efficient with our

cost courses money if they don't pump water efficiently, use too much electricity or are in constant need of repair.

Superintendents must clearly define the objectives of upgrading irrigation systems and then hire a qualified irrigation consultant and construction company to make their plans a reality, say some superintendents who have recently been through upgrades. Finally, superintendents must be prepared to oversee the project from start to finish. After all, if the new systems fail to produce results, it's their reputations on the line.

Define your expectations

Larry Rodgers, principal in the irrigation-consultancy of Larry Rodgers Design in Lakewood, Colo., says the biggest mistake superintendents make when they decide to upgrade their irrigation systems is they don't clearly define what they want the systems to do. If superintendents don't decide from the beginning what they want out of new systems, they're bound to be disap-

know what he wants before I can design a system to accomplish it."

It's important to define the objectives so a green committee will understand what they're buying. After all, receiving board approval for a new irrigation system is one of the toughest selling jobs superintendents have to do, says Randy Freund, president of Center Line Design, an irrigation consulting company based in Temecula, Calif.

"Superintendents with tenuous irrigation systems live every day in fear that they may not work on the most important days of the year, like the day before the member-guest," Freund says. "But as long as there is grass on the course, there will be some members and owners who will feel no change is necessary."

Fisher says it's important to present your committee with all the options, from the Cadillac of systems that irrigate wall-to-wall to more modest systems that will still get the job done. He adds that committees seem more receptive to the idea of upgrading the irriga-

water," Fisher says. "It was driving up costs, and it wasn't giving us the coverage we needed."

Superintendents, whose jobs are already stressful, may have a hard time making the case for an irrigation upgrade because golfers can't see or touch the improvements (the way they can, in contrast, to a new clubhouse dining room). But out-of-date irrigation systems can

pointed after the job is done.

"I'll go out to a job and the superintendent will say he wants better coverage, so he expects to do a major renovation that will tear up the course," Rodgers says. "On closer examination, he may only need different nozzles or heads, or a new pump station. He has to

tion system if it can be done in phases. The superintendent should be careful not to overpromise what a new system will do, however.

"Don't paint yourself into a corner by saying that the new system will solve all the problems on the course," Fisher says.

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"You shouldn't make promises that aren't demonstrable."

Hire a consultant

The consensus among the superintendents *Golfdom* talked to was that the first step in making an irrigation upgrade is to hire a consultant.

"You should definitely engage a qualified irrigation consultant," Fisher says. "Even if you know everything about irrigation, a question will come up from the green committee that you can't answer. That's why you need a professional at your side to give the members the information you might not have."

"You need to hire a good consultant, even if that means interviewing three or four before making a decision," says Tim Davis, superintendent at Shoreacres in

You Know It's Time to Upgrade Your Irrigation System When . . .

Golfdom asked superintendents to complete the sentence above. Here are some of their suggestions:

- the engraved stamps on your pump station fittings say 1948.
- you read an article that states our current technology was invented in 1968.
- you get a notice from the manufacturer that your control clocks are no longer being built
- your pressure tank has six welded patches on it.
- you spend more time talking to and coaxing it then you do with your family.
- technology advances to the point that sales and service can no longer remember how to repair your controllers.
- the heads are turning slower than the plotlines on your favorite soap opera.
- there are more leaks in the hydraulic tubes than from your average Congressional committee.
- you realize your computer software was made by Atari.



These distinctive brown circles are a stark indication that your irrigation system is not applying water evenly.



LARRY ROGERS DESIGN

1 Coordinate your renovation plans with all members of your team so it goes smoothly.

2 Make sure your construction team removes all rocks from around your pipes.

3 Pull enough wire so you can expand the system in the future as necessary.

Lake Bluff, Ill. “Include your committee chairman in the interviews so everyone up the chain is comfortable with the decision.”

The consultant should first do an irrigation audit of the course’s system to measure whether the system is doing what the superintendent thinks it is, says Joe Traficano, certified superintendent at Renegade GC at Desert Mountain in Scottsdale, Ariz.

“You need numbers that are real-world, not theoretical,” Traficano says. “I’ve talked to superintendents who are working from irrigation numbers that are ‘as-built’ rather than ‘as-functioning.’ Sometimes there’s a 5 percent to 10 percent difference between the two numbers. An audit will clear up any discrepancies.”

Rodgers says a good consultant will be willing to take the heat from the green committee if the process doesn’t go exactly as planned.

Davis urges superintendents to turn

to outside consultants to design the upgrade instead of relying on the personnel from the company that is selling the system.

“Since you’re spending so much money on a new system, you need an independent evaluation,” Davis says. “The manufacturer’s representative may want to sell you a system from his company without looking at all the options.”

Starting the construction

Once the design is finalized, a superintendent should be involved in picking the contractor who will do the work. As with the consultant, a superintendent should have the contractor meet with the decision-makers at the course so everyone understands the full scope of the project, Davis says. Check a contractor’s references with his or her colleagues.

“When we were deciding on a contractor, we had the companies come out and tour the course with me and the

green chairman,” Davis says. “It smoothed the process considerably to have people working together who were comfortable with each other.”

Rodgers says the consultant can recommend construction companies that have experience in installing irrigation systems. He warns superintendents to be wary of companies who don’t include specific irrigation projects in their portfolios.

“Since the building boom of new courses ended, there’s a dearth of work for a lot of general golf course contractors,” Rodgers says. “There are a lot of companies who would jump at the chance to do your course’s upgrade, but unless they have experience specifically dealing with irrigation systems, you shouldn’t hire them.”

As the work progresses, the members of the maintenance team responsible for the future upkeep of the system should be

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Irrigation Upgrade?

SHOREACRES



1



2



3

1 It's important to have a large enough mainline to allow an adequate flow of water through it.

2 Setting a vertical turbine pump is a delicate business.

3 Superintendents should educate themselves on the different components of the system, including the intake valve.

Tips on Avoiding Coverage Problems

Superintendents will notice a faulty irrigation system when inadequate coverage turns their beloved courses' green turf to brown. How can you avoid replicating coverage problems when you make an upgrade? Experts offer the following tips:

■ **See if your distributor will loan you a couple of nozzles to try under real-world conditions.**

Joe Traficano, certified superintendent at Renegade GC at Desert Mountain in Scottsdale, Ariz., says irrigation distributors in his area will often loan nozzles to superintendents to try for a limited time.

"It's not expensive for them, and it helps you make an informed decision," Traficano says. "It makes sense for them to do it, especially if you're going to spend significant money with them on a full upgrade."

■ **Ask your consultant to see the test results for your heads from the Center for Irrigation Technology (CIT), an independent irrigation research and testing facility in Fresno, Calif.**

Randy Freund, president of Center Line

Design, an irrigation-consulting company based in Temecula, Calif., says superintendents should ask their irrigation consultants for the data from CIT before making a decision.

"CIT tests nearly every head brought to market," Freund says. "It will give you real-world data to see if the heads you're considering meet your needs."

Freund offers one caveat on CIT's data: The heads aren't tested in windy conditions, so superintendents must calculate those effects on their own. He says that if your site is buffeted by frequent winds, you should purchase nozzles and heads that produce larger, heavier drops to withstand the wind.

You can visit CIT on the Web at cati.csufresno.edu/cit.

■ **Coordinate the choice of nozzles and heads.**

Mike Kuhn, a former superintendent who is now a partner in the irrigation-consulting firm of Colein & Kuhn Associates of Rochester, Mich., says superintendents should purchase their nozzles and heads

as a package. "If you purchase heads and nozzles that aren't compatible, you're going to have coverage problems."

■ **Space your heads appropriately.**

Freund says he recommends spacing irrigation heads at intervals no larger than 65 feet.

"Superintendents think they're saving money by spacing heads farther apart because they're buying few heads, but they're not," Freund says. "You'll end up spending more money on a pump station because you'll have to pump the water more forcefully to make sure it reaches the turf properly."

■ **Check nozzles to make sure they all provide the same application rate.**

Just because you install the same nozzles in all the irrigation heads doesn't mean they'll put down water at the same rate, says George Hamilton, assistant professor of turfgrass science at Penn State University. Variations in topography can alter the calculations, so superintendents need to take them into account.

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involved in overseeing the construction, Davis says. They should see exactly why heads are placed where they are. Superintendents should map the project with a GPS/GIS system so accurate records are kept about where each of the pieces of the new system are located, he says.

Davis also advises superintendents not to schedule any vacations during an upgrade: "There are some long days when you take on a project like this, so prepare your family ahead of time."

Rodgers says superintendents should make sure the work on each hole is completely done before the construction company moves on to work on the next hole. Otherwise, inconvenienced golfers may start calling for a superintendent's head.

Mike Kuhn, a former superintendent and a partner in the irrigation consulting firm of Colein & Kuhn Associates in Rochester, Mich., says superintendents should educate themselves about

Time for a Change?

Brian Vinchesi, president of the American Society of Irrigation Consultants, provides the following guidelines for the average lifespan for irrigation parts:

Part	Lifespan (in years)
Irrigation Head	15 to 18
Gate Valves	15 to 20
Pumps	20 to 25
Pipe	30
Controllers	10 to 15
Computer Hardware	3 to 5
Computer Software	1 to 3
Wire Connections	25

the latest irrigation technology before construction starts. It will allow them to keep closer tabs on the process.

"Turf schools don't always teach superintendents what they need to know about irrigation," Kuhn says. "They need to do their homework so they know

what they're looking at as each hole gets finished."

Aftercare is important

Freund says the final step in construction should be a walk-through with the consultant to make sure everything is done according to the expectations outlined in the contract. He says the superintendent should create a punch list of items he wants the consultant to check.

Rodgers recommends the consultant be responsible for setting up the computerized control system unless the superintendent is extraordinarily computer-savvy.

"You want to let the consultant make any mistakes in the computer programming," Rodgers says. "The superintendent should follow along so he can make changes after the system is up and running, but you want to make sure the consultant is responsible for the original setup."

Traficano says superintendents

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Terms You Need to Know to Ensure an Efficient System

George Hamilton, assistant professor of turfgrass science at Penn State University, says superintendents need to factor the following terms into their calculations on picking an irrigation system during an upgrade:

■ **Evapotranspiration** – Measured in inches per day, it's the amount of water a plant loses through evaporation and breathing.

"To manage an irrigation system most effectively, you have to know how much water you're losing," Hamilton says. "You want the amount of water you put down to equal the amount you're losing to keep the moisture level constant."

■ **Precipitation rate** – Measured in inches per hour, it's the amount of water making it to the turfgrass system during irrigation.

"This is one of the most important terms to understand," Hamilton says. "If you don't know how much water your sys-

tem is putting down, you'll have no idea how long to run your system."

Hamilton says superintendents must make sure these factors are programmed into control systems so they can monitor their effectiveness.

"Monitoring mechanisms for these items can't be overlooked when a new system is installed," Hamilton says. "A more efficient system will save water and energy, and these two items are the most accurate measures of how your system is doing."

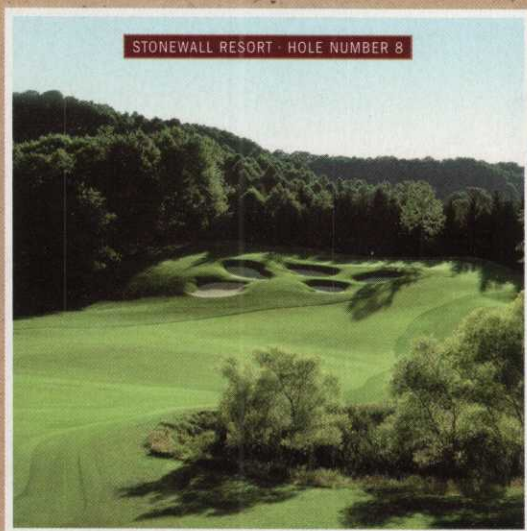
Randy Freund, president of Center Line Design, an irrigation consulting company based in Temecula, Calif., suggests three other terms superintendents should know when deciding which system will work best for their courses:

■ **Coefficient of Uniformity (CU)** – Measure of the uniformity of irrigation water appli-

cation. The average depth of irrigation water infiltrated minus the average absolute deviation from this depth, all divided by the average depth infiltrated (the higher the number, the better).

■ **Distribution Uniformity (DU)** – Measure of how uniformly water is made available to the plants over an area. DU is expressed as a percentage and generally represents the major component of irrigation efficiency. A DU of one (100 percent uniformity) represents all of the area infiltrating the same depth of water (the closer the number is to one, the better).

■ **Scheduling Coefficient** – Numerical expression which serves as an index of the uniformity of water application to a given area within a specific geometric arrangement of sprinklers (the lower the number, the better).



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should upgrade computer systems during the off-season so they have time to figure out any quirks in systems before their use becomes critical to golf course conditioning.

"It will allow you to learn the whole compatibility of the system before the pressure is on," Traficano says. "You can make subtle changes to the program and fine tune it."

Freund says that once the new sys-

Superintendents should check pumps daily with logging devices that will ensure proper efficiency.

tem is installed, superintendents should check the heads monthly and repair as needed.

He adds that they should also check pumps daily through logging devices to ensure the proper pump efficiencies are being maintained.

Fisher is looking forward to seeing

the full benefits of his new system in 2005. Until then, he's enjoying the subtle changes that have resulted from the first phase of his project.

"Our initial work has cut the water window to between four and five hours," Fisher says. "I can't wait until the rest of the upgrade comes on line." ■



Devising a clear strategy for your renovation will minimize the inconvenience for you and your golfers.

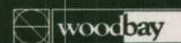
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