



**Jeffrey D. Brauer** is a licensed golf course architect and president of GolfScapes, a golf course design firm in Arlington, Texas. Brauer, a past president of the American Society of Golf Course Architects, can be reached at [jeff@jeffreymbrauer.com](mailto:jeff@jeffreymbrauer.com).

## SMART IRRIGATION INVESTMENTS

In the past, I've stressed the idea of intelligent investment, or spending money to rebuild and upgrade a course's infrastructure to improve maintenance and reduce long-term costs.

When looking at the cost/benefit ratio of an infrastructure, there's little question upgrading an irrigation system often pencils out as the best investment one can make. And numbers support that. The irrigation industry spent its formative years working to let superintendents irrigate more turf more reliably. But with current and proposed water restrictions in many areas, irrigation companies now focus on more efficiency.

The newest generation of irrigation systems offers substantial, reliable upgrades with better gear drives, solenoids and grit resistance compared to their predecessors. More importantly, new sprinklers offer substantial cost savings for water and electricity use. The advances are so broad, any course with a system older than 10 years should consider new components or an entirely new system. If your system is 20 years old, a new system would be worthwhile.

Improvements of sprinklers, control systems and designs provide laser-like precision for applications. Distribution uniformity of the newest generation of sprinklers has improved to 88 percent from 67 percent just a few years ago. Distribution uniformity is a measure of uniform water application within a sprinkler's coverage area – 100 percent is a perfectly even application. At 67 percent, one needs to run the system one and a half times longer than required to assure adequate coverage everywhere ( $1/0.6666 = 1.50$ ). At 88 percent, additional running time is reduced to about 14 percent. Thus, simply replacing worn-out sprinklers might offer water and electrical savings of 23 percent.

Some courses have experienced an additional 23-percent water savings by installing a new system designed for precision application. Irrigation designers know more

sprinklers means less water usage. Tighter spacing increases distribution uniformity and fights wind effects. Using back-to-back part circle heads – once thought to be a luxury between greens and surrounds – is used commonly to increase control differential for fairways and roughs. Using part circles on the border between turf and native areas eliminates unnecessary irrigation of native areas.

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New irrigation system designs also focus more on control flexibility. This allows superintendents to fine tune a system to irrigate different microclimates (such as hills and valleys or shade and sun) much better than designs a decade ago, which focused on minimizing pipe and wire. Better control reduces water use and annoying wet or dry spots, which enhances turf health and play quality.

Irrigation control no longer requires guesswork, and systems never have to run while it's raining. Newer central controllers are smarter and use real-time evaluation and data from past experience to constantly

and intelligently adjust, cancel, pause and/or resume irrigation programming in response to changes in temperature, wind, precipitation and evapotranspiration. Central control systems can monitor system flow to keep pipes running near capacity. This shortens watering time, saves water and energy, reduces pipe and pump wear, and completes watering sooner, allowing earlier mowing to beat the crowd.

New wireless soil monitoring systems – which allow superintendents to determine irrigation need based on actual soil moisture, salinity and temperature measurements rather than computer calculations of ET – show great promise for additional water savings. Naturally, the location of these devices in representative microclimates makes them the most effective.

In one instance, a superintendent documented 46-percent water savings on a per-acre basis after installing a new system based on modern components and precision design. Some clubs use water savings to water more acreage and improve turf. Others choose the cost savings of using less water. Some use new systems simply to survive newly imposed water restrictions. I recently proposed a precision watering system for a course that will add nine holes to avoid the cost of rebuilding a supply line. Precision systems cost more up front, however.

"While long-term savings will offset up-front expense, in the current economy, many courses still opt for less-expensive systems," says Terry Little, an irrigation consultant with Aqua Engineering in Fort Collins, Colo. "Like many irrigation innovations, the new technology seems more common in the West, where water needs are often most critical. But it works everywhere."

Current cost concerns aside, the least-expensive way to do something is to do it right in the first place. That idea holds true now more than ever regarding irrigation. Building as sophisticated an irrigation system as you can afford pays big dividends down the line through reduced water and power usage and better turf. **GCI**