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## TURF'S MOST IMPORTANT CHALLENGE

In a recent visit with my 4-year-old granddaughter, Ella, she introduced me to her new neighbor and playmate, Lucy.

"This is my grandpa," Ella said, adding, "He makes a lot of funny noises!"

Clearly, Ella thinks I am firmly settled in geezer land!

She might be right. After all, I've been involved in the golf turf industry for nearly 50 years. What changes I have seen in those five decades.

Today's equipment barely resembles those used in the 60s. A strong argument could be made that turf irrigation has experienced more change and progress than anything else a superintendent manages.

My first working experience on a golf course was at a very nice private club. It was in the middle 60s and the fairways were not irrigated, except for a few areas we tried to water with a Rain Train traveling sprinkler. The course was bordered on three sides by the University of Wisconsin Arboretum, and during dry periods we worried about a grass fire that could move into the wooded arboretum. We kept the John Bean sprayer filled with water and ready to go.

The club decided to make a major improvement and invest in an automatic irrigation system with electro-mechanical controllers, the first in our state. We had green fairways! The installation was so impressive that we hosted a WGCSPA meeting and the afternoon was spent with demonstrations and education about this watering system marvel.

I interned at a nice club that had center row quick couplers valves for fairway irrigation. The valves were about 80 feet apart – too close and the result was chronic wet areas in the middle of fairways. Greens and tees were watered from a sod cup in the center of each. It was quite a sight to

see a John Deere 310 backhoe parked on the 18th green one day, digging up a leaky steel pipe in the middle of the green! Obviously, uneven distribution was a problem with all systems like this one, and the use of Cushmans and a night employee created issues, too.

I was hired to manage a private course that had the first irrigated fairways in Wisconsin. The system I inherited was installed by the famed irrigation engineer Scott Stewart in '38 and we were still using it in '73.

When I look back to watching my grandfather use a forked stick to dowse for spring water on his farm, to contemporary golf course irrigation considerations, I really do feel my age.

Greens and tees were still watered with hose and roller base sprinklers. We quickly updated to provide perimeter irrigation, but we still had to wrestle with finding and training someone to do the watering at night. The fairway valves were 100 feet apart and we did a lot of hand watering to even out distribution.

We got caught up in '88 with a Toro Network 8000 system. A good investment, yet long before I retired it was becoming outdated. Since then, the club has replaced controllers and heads, working toward every superintendent's goal of uniform coverage.

And so it has been all across golf. For me, at least sourcing water wasn't an overwhelming problem; after all, we get 34.5 inches of precipitation per year and the course is on the shores of a lake. We have riparian rights and although we have to filter the water, it is reliable and the cost is basically the cost of electricity to pump it up and onto the course. Not so in other parts of the country. Water shortages have forced new technologies, acceptance

of recycled water and changes in areas irrigated. The limits of water sources have initiated breeding programs in search for drought tolerant grasses suitable for golf.

Pump stations have undergone substantial engineering improvements. I started with a small building, a huge pressure tank and water probe, and left a top-notch poured concrete building with variable frequency controls. It was reliable and efficient.

I have witnessed huge improve-

ments in turf cultivation equipment and the positive effects those machines have had on turf rooting and the resultant decrease in water requirements. Also, superintendents have taken advantage of the wide range of surfactant products available, which have made our use of water more efficient. They aid with infiltration and retention and are key components of many water management programs on golf courses.

Our golf course was built in 1920, and I have always marveled at the careful grading that was done to move surface water around the course. Today we see civil engineers designing grading projects for golf courses to divert and capture storm water and urban runoff for use in irrigation.

Let's not forget how much weather forecasting has improved in recent years. Every superintendent now has access to forecasting not even imagined a few years ago. Those forecasts

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To understand the sort of issues we'll be dealing with, check out this study of subsidence in California's Coachella Valley (Enter [on.doi.gov/145fYKX](http://on.doi.gov/145fYKX) into your browser to read this study). The end result was a \$50 million pipeline that brings additional surface water from the Colorado River to Coachella Valley, the region that includes Palm Springs. The water comes into a reclamation plant where it's blended with recycled water to meet the summer demands of up to 50 golf courses that draw on the aquifer.

Another term splashed about at water conferences is "direct potable reuse." The availability of recycled water for irrigation may decline as new methods of treatment allow for more recycled water to go safely back into the water system for drinking. Here's an example from Texas (Enter [nyti.ms/WTx8IF](http://nyti.ms/WTx8IF) into your browser) and a demonstration project in San Diego (Enter [bit.ly/bHkurf](http://bit.ly/bHkurf) into your browser).

A leading irrigation consultant told me that such projects are, "a double-edged sword because yes, they increase supply, but advanced treatment means higher water rates for the membrane (reverse osmosis) operation and brine disposal infrastructure and operating costs. This process is just starting to gain traction in the industry."

All of which means that while you also might not like water, you need to know about it. Down to the last drop. Okay. So what do I like about water?

I like that it comes in three forms: frozen, liquid, or gas.

That three-quarters of the earth's surface is covered in water, and that we are trying to find safe ways to harness its power.

In frozen form, it's ideal for skating, a key element of my second favorite sport – hockey, and the perfect complement to my post-round Grey Goose and tonic.

I like showering after a long day on the golf course, and especially at great clubs like Riviera, Merion, and Pine Valley where the showerheads are big and fully pressured.

One more thing to like about water: It keeps us healthy. Remember to stay hydrated, and to make sure your staff drinks enough water, too. Unlike golf courses, for us there is almost no such thing as too much water. **GCI**

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sand topdressing, and the unorthodox use of the fairway rollers as a squeegee allowed the native soil golf course to bounce back from several inches of rain in just a day or two. It's important to point out these results didn't happen overnight. Many years of modified cultural practices were used in advance of the championship to ensure the course was playable if and when a major storm hit.

The bottom line? Many things can impact the playability and health of your golf course, and irrigation/moisture management is high on that list. While some of these practices can have a quick impact on moisture management, others require long-term planning and implementation before the practices pay off.

While we continue to increase our use of scientific instruments to help determine irrigation inputs, the overall process will continue to remain more of an art than an exact science. The turfgrass managers that fine tune irrigation and moisture management are usually the ones that make it through the most difficult of conditions. The superintendents who figure out how to combine the art with the science will likely continue to have the most success. **GCI**

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At the same time, irrigation and water management issues were taking 80 percent of Eric's time. With the new system, irrigation materials and labor repair costs dropped to \$2,500 annually and hand-watering hours dipped to 500 hours (50 percent less). The greens are now hand watered, which they were not previously, and accounts for the majority of the hand watering. This decrease in labor has allowed the staff to concentrate on other course improvements.

The new irrigation system has greatly improved the consistency of the course playability, not only on a hole-to-hole basis, but from a month-to-month basis throughout the golf season. It has also been a major factor in the aesthetics of this link-style course allowing it to be dry where and when it is supposed to be, which has brought out the original design intent. **GCI**

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have a tremendous influence on irrigation decisions – we water smarter.

We tend to focus on applying water to golf courses to even out precipitation. But in a year like this, drainage systems can be important to good golf turf. During this year's Memorial Tournament, Jack Nicklaus was discussing a drainage project and concluded with, "Drier golf courses are more fun to play." He's right.

Water is obviously the most important factor in manag-

ing a golf course. Turf cannot live with either too little or too much. And water has become a national concern in the most recent decades. When I look back to watching my grandfather use a forked stick to dowse for spring water on his farm, to contemporary golf course irrigation considerations, I really do feel my age. That perspective, however, leads me to have a lot of confidence that our golf turf industry will continue the innovation needed to carefully use this precious national resource. **GCI**