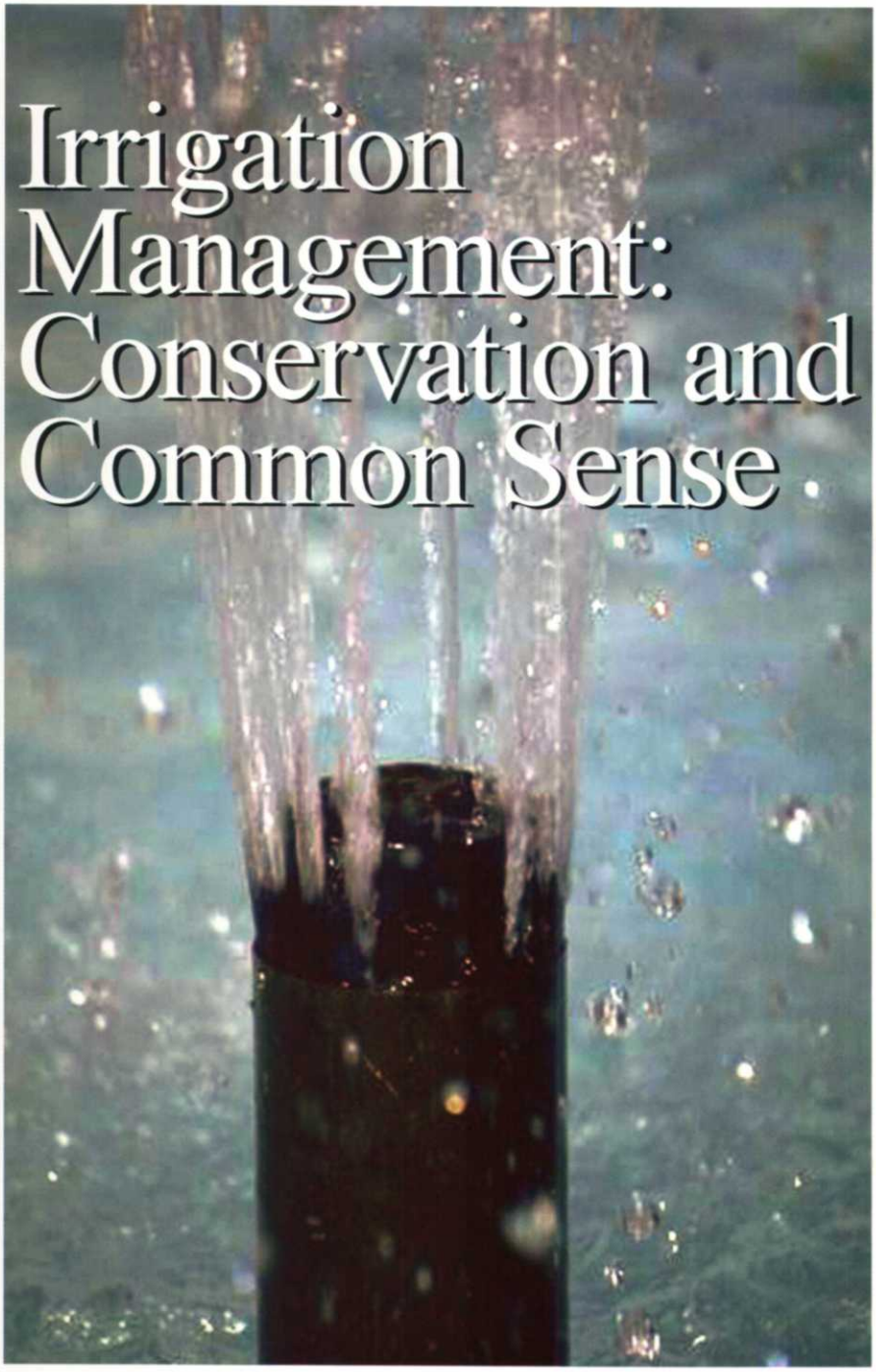


Irrigation Management: Conservation and Common Sense

By Joel Jackson, CGCS

You should know the story by now. Most of the earth's water is sea water. Some say about 97 percent. Another 1-2 percent is tied up in the polar ice caps. That leaves 1-2 percent of relatively easily accessible fresh water for all of our needs. Agreeing on the priority of those needs is the vexing question facing water-management districts and local authorities, and as we know, golf is low on their list. While playing golf may be a game, managing turf and operating a golf facility is a business... a big business in Florida.

Golf is in one of the lowest water-consumption groups tracked by water management districts. From actual consumption figures I have been able to find on web sites, the recreational/aesthetic use of water generally accounts for only 3-5 percent of the total daily consumption. Keep in mind we're just part of that group so the actual number for golf is lower. National figures compiled by the Irrigation Association suggest golf's water consumption to be around 1.5 percent. Combine that with consumptive-use permits (CUPs), the need to have good playing conditions, and improved irrigation technology and we are some of the best water managers around while being one of the most regulated. All because we are so visible.

It has been my experience to grow up in golf-course maintenance from the late 1950s to the present. I have operated a quick-coupler manual system as a teenager making my rounds during course grow-in. Then at Disney, I got to experience the Binar electrical system, which added lots of flexibility, but those decoder blocks in the ground were great lightning rods. Then I had a Buckner hydraulic system with a rudimentary central control panel. Most of the settings and adjustments were made at the satellite boxes, which made for a lot of trips around the course to make last-minute changes due to changes in the weather or the superintendent's mind.

A Toro Varitime II hydraulic system at Isleworth didn't eliminate the satellite box stops, but the master control board did allow multiple programming of fixed run-time cycles of 4 minutes, 8 minutes, etc. Finally in 1991, I got to experience the Rainbird Maxi V system back at Disney, and computerized control systems have been evolving ever since. They certainly offer a turf manager a lot of flexibility to prescribe water for small areas on the course to prevent wet and dry spots... if the system has been designed properly and you have single-head control.

Besides computerized control systems, the next best tool is a well designed delivery system. That means that the system needs to have correct pipe size, proper head spacing and location and a good isolation-valve network to shut down zones with leaks without shutting down the whole course. There should also be a network of manual quick-couple valves for hand-watering greens and tees and maybe even fairway bunker complexes. Many new courses are installing double-head systems around the greens so that the putting surface can be watered independently from the surrounding slopes, which may be built out of less porous soil and require less water.

Along the way, my water sources were direct pumping from a surface water lake fed by an artesian well, pumping directly from a deep well, pumping from a lake recharged by a deep well and reclaimed water piped into the mainline and pressurized with a booster pump. In my career I never had to contend with water restrictions like we have seen lately, but the goal of turf managers is always to use water wisely for to produce the healthiest turf and best playing conditions. Lately we have been learning to do more with less.

Even reclaimed water is not a panacea. Utilities have been prone to see the gold in them 'thar gallons and outrageous rate hikes of 350 percent have torpedoed course maintenance budgets. Local authorities seem to forget that using golf and landscape irrigation as community spray fields is providing them with a service which is saving them disposal costs.

As we have had to operate under water restrictions the past few years due to the persistent drought, two things have been abundantly clear to superintendents. First, they learned they could manage their golf courses with less water, and second, they could not effectively manage them by following the simplistic but totally ineffective method of restricting irrigation by the day of the week.

The only thing dictated by day-of-the-week watering schedules is when you water, not how much you water. Some water district officials have admitted that this method did not really save much water. Instead it forced water users to overwater on specific days to try and keep the root zone moist until the next scheduled irrigation. Overwatering brings on another set of problems including poor playing conditions and poor turf health often requiring application of more chemicals to treat weeds and disease.

For those whose pumping capacity was limited or who had sandy soils, it encouraged - or rather forced - them to water off-schedule just to keep their turf alive and functioning. A rule or law that forces someone or a company to break the rules just to survive is plainly a bad rule.

I heard some superintendents documented their reduction in overall water use to cover themselves, but they watered when they had to, not on the arbitrary day of the week. They met the intent of the law, water conservation, in spades, but they violated the letter of the law which is flawed by not addressing practical agronomy or horticultural requirements. Their message is: We can and will cut back on amounts used during droughts, but let us apply the water when we need it. Enforcement is possible through pumping reports.

To the credit of many superintendents and the water management districts, they have made good strides in working out practical solutions to these problems. This is a never-ending process and it is critical that superintendents keep their owners advised of the issues and solicit their help in educating politicians, water management districts and the general public about golf's true impact on the community.

TALE OF TWO COURSES

High & Dry or Low & Wet, Use Common Sense

The Highlands Reserve Golf Course is located in northeast Polk County just off US Hwy 27 on the sandy ridge that runs from Ocala to Sebring, and it's also near the eastern boundary of the Southwest Florida Water Management District. Superintendent Dave Datema, CGCS recently moved over from Disney and arrived in time to feel the full effects of the drought on this high and dry layout. Dave's current water source is ground water, but a reclaimed water line is being installed along US 27 from Haines City to the intersection of U.S. Hwy 192. The amount of reclaimed water Dave will have to use is unknown at this time, but hopefully he will be able to pump less ground water in the future.

Meanwhile over in Winter Park, Stuart Leventhal's Interlachen Country Club was built on an old peat bog that wasn't suitable for residential development. Interlachen is located right next door to the local water treatment plant and so Interlachen irrigates totally with reclaimed water, but does have a backup well in case of emergencies. Drainage and percolation are polar opposites for the two courses and yet the management of the irrigation is based on the same concept - common sense.

Highlands Reserve drains so quickly that, during tropical storm Gabrielle last August, Datema's crew was mowing fairways when the eye of the storm passed over. That was after six inches of rain the previous night and morning. Over at Interlachen when summer rains kick in, Leventhal may not irrigate the fairways for four to six weeks. In fact they often have to go out and trim the grass back off the heads from lack of use.

Under normal conditions Highlands Reserve will pump 350,000 - 375,000 gallons per irrigation cycle and Interlachen will pump an average of 155,000 gallons. Both superintendents are addressing the needs of the turf and maintaining good playing conditions, and both use weather forecasting data to adjust their nightly watering to reflect the constantly changing conditions.

With the sandy conditions at Highlands Reserve, Datema has had to amend his native-soil greens to slow down the water percolation since there is no perched water table effect.

"While the greens drain super, I cannot

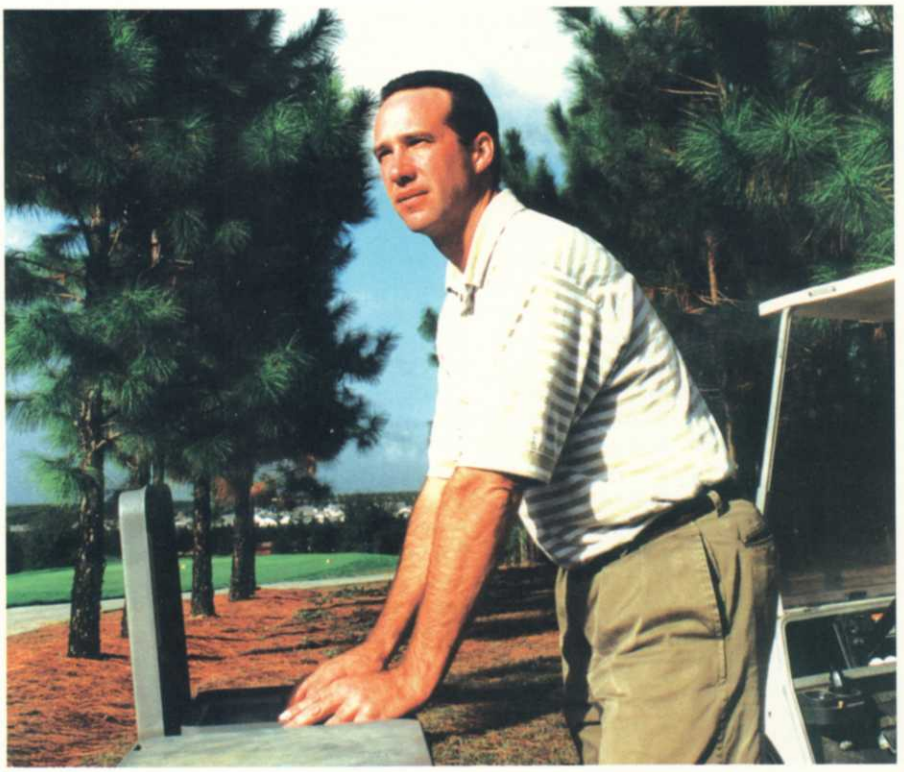
keep the root zone moist without daily watering," says Datema. "This past spring I aerified with 1/2-inch tines on 2x2 spacing, removed the cores and topdressed with a 70/30 sand and peat mix and some granular LescoFlow wetting agent. We dragged that into the holes and found we have helped some of our chronic hot spots to disappear and maintain better turf cover."

Over at Interlachen, Leventhal has no real option to amend the heavy soil under the fairways. His salvation has been an upgraded irrigation control system.

"Going to the Rainbird Cirrus control system is the best investment we have made," Leventah says. "With the precise timing control of the computer, we have been able to micromanage our heads and regulate the playing conditions much better than the old electro-mechanical dials which could be off minutes plus or minus."

Both superintendents put irrigation monitoring as a high daily priority, and the superintendent, assistant or irrigation technician inspect, monitor and make changes as needed. To the trained eye, uneven dew patterns in the morning reveal the onset of dry conditions or malfunctioning sprinklers or maybe even a zone or system failure. Wet spots are clues to leaks and stuck heads. Later in the day foot printing (collapsed blades) and gray colored turf are sure signs that wilt conditions are setting in.

Special projects, meetings, repairs etc can take the primary irrigation observers off task on



Dave Datema, CGCS, superintendent at Highlands Reserve GC, adjusts his irrigation program daily to allow for changing conditions and turf stresses. Photo by Joel Jackson.

any given day, so observation and monitoring is a team effort by the whole staff.

The person who cuts cups is also trained to report wet and dry conditions in the soil plugs taken when moving hole locations on the greens. Other crew members, especially equipment operators, are trained to report damaged heads and wet or dry areas.

Both superintendents employ wetting agents to help the plants take up water more efficiently. At Interlachen the heavy soils can be induced to percolate better and at Highland Reserve they help the quick-draining soil from becoming hydrophobic.

Datema says, "We make a wall-to-wall wetting agent application through our fertigation system about once per week. We also make applications to greens and tees using our portable sprayer. In fact, if rain is forecast we specifically time those applications to help the rainfall penetrate and not just run off."

While Interlachen is not impacted by water restrictions with its reclaimed water source, Highlands Reserve is in a more precarious position.

"I understand the intent of water restrictions during drought conditions, and I make sure we conserve water," Datema says. "When directed or asked to cut back, I cut back, but in all honesty in the performance of my job to manage our turfgrass, I have to fudge on the day-of-the week schedules, but I feel like I am within the rules that allow for watering to prevent heat stress.

"We normally run 20 minutes per fairway head per night, assuming no rainfall help. With restrictions in force, I can cut that time by 66 percent to 7 minutes per station and thus save water, which is in keeping with the intent of the restrictions. But I cannot keep the root zone moist in this sandy profile by simply cranking up the time on the fairway heads and only watering one or two days per week.

"The soil drains so fast I'm just wasting the water. It makes more sense to put out less water overall, but more often when the plant needs it and can use it. Compounding the problem is our high nematode counts in this old orange grove location. They keep the grass roots short so they can't take up more water even if I increased the times."

Both superintendents agree that people in the industry have gotten more water-wise over the years especially with the advancements in the technology. As Datema says, "There are abusers in every business and I'm sure there are some folks out there who still overwater out of habit or ignorance or a fear that using less will jeopardize their jobs. But most superintendents have tried to live within reason while respecting the intent of restrictions."

One of the best examples of being water-wise was observed when I visited Olde Hickory C.C. last year for a cover story. Instead of maxing out his run times during periods of no restrictions, John Stach knew that restrictions would invariably return, so he kept his turf hardened off and learned to produce good playing conditions with less water. This is a lesson every superintendent needs to learn in the coming days of water shortages whether they are real or political.

To that end, every superintendent needs to discuss his current irrigation management program with his/her ownership. The owners need to take responsibility for how the superintendent proceeds, especially during water restrictions. It is not good stewardship or responsible leadership to merely tell a superintendent, "Keep it green or else." During droughts, club owners and members need to expect firmer, faster and temporarily off-color turf. Each club should make every attempt to reduce overall water use during droughts and document the savings of water.

As Datema puts it, "The basic tools of turf management have always been irrigation, cultural practices and chemicals and fertilizers. When control of our most important tool, water, is taken out of our hands, it's like trying to manage the course with one arm tied behind your back. We need a good, common-sense approach to water conservation and not some convenient arbitrary rules that don't address the root of the problem."

Joel Jackson, CGCS

A 17-YEAR SAGA

Our Water is Gray, but Our Grass Is Green

Our water source at Winter Pines Golf Club since 1984 has been 100 percent reclaimed water, and our main line is connected directly to the Winter Park Estates Treatment Plant approximately two miles away. We are connected from the city's 24-inch mainline by a 15-inch line and then a 10-inch line that runs to the center of the golf course and connects to the course's 6-inch mainline pipe. We share this reclaimed water source with Interlachen C.C. and several of the city's park and recreation areas.

The pump station is located at the treatment plant and maintained by the city. We have 120 psi static pressure in the pipe 24 hours a day which delivers 60 psi at the sprinkler heads. The city maintains the main line and we take care of all other lines on the property. We have no back-up system, so we are dependent on the city for having the system up and going all the time, which is part of the contract. They have been excellent at supplying us with water for the past 17 years.

We have a contract to use around 150,000 gallons a day and to pay for the electricity to pump it to us. However, we are not required to pump the water if we don't need it on rainy days, and we can exceed that amount if we are in dry period or have to water in pesticide or fertilizer applications.

The overall water quality has been good, but we usually make 1-2 applications of gypsum during dry periods to combat some of the high sodium and bicarbonates in the water until we get some good rains to help flush them out of the root zone. A little extra spiking and slicing also helps minimize any water quality problems on our weaker greens.

Our control system consists of nine Griswold 24-station satellite panels located around the course. To aid in cold and weather protection, each one is mounted inside a separate locked cabinet, which helps provide insulation from heat and cold. We also have Griswold electric valves in the ground which control anywhere from one to five heads each, depending on their location. We don't have a central controller, so each satellite is adjusted daily to meet the conditions or shut off manually when it rains. A normal night irrigation cycle takes six to eight hours to complete.

Inspection of green and tee head operation is usually done twice per week by using a syringe cycle to check proper head rotation and nozzle performance. Fairway heads are checked while syringing off the dew ahead of the fairway mower on certain holes with heavy growth. Any repair work is done by me or the assistant superintendent.

We like to use Rainbird 51D impact sprinklers on the greens and tees so if we need to syringe a localized dry spot, we can just hold the impact arm and aim the head. It saves dragging a hose when time is a factor on a busy public course. We don't have a lot of quick coupler valves anyway.

Most of the fairways have double-row coverage with Rainbird 81B, Thompson 188s or Legacy G90s. We have part circle Rainbird 47Ds and Legacy G95 part circle heads along lake banks, property lines and at the clubhouse area.

The fertigation system was taken out when the old pump was removed and we hooked up to the city's reclaimed water line. All foliar fertilizers, wetting agents and growth regulators are applied with our Smithco 160 Spray Star. Primo (PGR) is used on some of our wetter fairways and the driving range during the summer. Wetting agents are applied as needed on greens, tees and fairways to help moisture penetration along with frequent slicing of chronic problem areas.

As with any older system, we are constantly tweaking the design by moving or adding heads to get better, more efficient coverage to help grow healthier turf.

Joe Ondo, CGCS

Joe Ondo, CGCS is superintendent, Winter Pines GC; 407-657-7565; fax 407-671-3420.

Elevate to Irrigate Temporary Nursery

Eric von Hofen, director of agronomy at Calusa Pines Golf Club unquestionably had his hands full when he accepted his current position at the recently opened Hurdzan/Fry-designed golf course in Naples. The golf course, which is certain to receive accolades for its dramatic design, will definitely also catch the eye of many for the extensive landscape that complements the 18-hole layout. According to von Hofen, over a million dollars of landscape was installed during the construction of the golf course, for which he was responsible for the placement, and survival. The species that were planted included live oaks, cabbage palms, slash pines, palmettos, and hundreds of thousands ornamental grasses, all of which blend in nicely to the existing flora giving the perception that the course has been in place much longer than it has.

With the ownership of Calusa Pines providing the extensive funds that were needed to construct the golf course and the facilities, it was expected for all parties involved to be diligent and not allow any waste to occur. To help assure the survival of the vast quantity of containerized plant material prior to installation, von Hofen directed the construction of a temporary holding area where all landscape material would be delivered, stored for an extended period and receive immediate irrigation.

To help assure the survival of the vast quantity of containerized plant material, von Hofen directed the construction of a temporary holding area where all landscape material would be delivered… and receive immediate irrigation.

To assure adequate moisture would be provided to each and every plant that was delivered, a temporary overhead irrigation system was installed. To accomplish this, six pine trees that recently had been discarded from the golf course clearing process were limbed up and cut to a length of approximately 35 feet. These straight tree trunks were then buried to a depth of ten feet, leaving approximately 25 feet of exposed trunk. A two-inch PVC line was attached on the side of each trunk leading to the top where a full circle Toro 670 irrigation head was secured. Each head can be isolated at the base of the trunk with a quarter turn ball valve. The trunks were placed in a grid, three per side and approximately 60 feet apart.

A simple, inexpensive quarter-turn ball valve controls water flow to each sprinkler. Total cost of temporary irrigation system was less than $100 to protect huge investment in plant material. Photo by Darren Davis.

Toro 670 heads were mounted on trimmed pine tree trunks to cover nursery holding area. Elevated position insured all plant material received adequate watering. Photo by Darren Davis.

The water was needed prior to the installation of the computerized irrigation system on the golf course so originally a portable pump was used to supply water from a nearby lake. However, once the irrigation system was in place, a "T" was added in an adjacent main line so the system became a little easier to operate.

Being overhead, it was easy for von Hofen and his staff to see from a distance and know that it was in operation which gave them peace of mind knowing their concentration could be given to other necessary tasks. The end cost of the entire system was less than $100 due to the fact that the six irrigation heads went into inventory for future use on the golf course leaving the only true cost being the discarded PVC pipe and PVC quarter turn ball valves.

Darren Judd Davis.

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