

# MAKING EVERY DROP COUNT

Dealing with a restricted water supply in the Southwest.

BY PATRICK J. GROSS

**M**ark Twain once remarked, "Whiskey is for drinking; water is for fighting over." With much of the southwest United States experiencing a fifth year of drought, fights over water have already begun in San Diego, Reno, Las Vegas, and other parts of the region. The urgency of the situation was highlighted by John W. Keyes, III, a commissioner with the Bureau of Reclamation, with the following remarks to the Colorado River Water Users Association in December 2003: "We are now on the cusp of the most severe drought on record. One more year will push us over the edge. This drought is even worse than that of the Dust Bowl years during the 1930s." Given the stark reality of a restricted water supply, superintendents are implementing a variety of water conservation measures to make every drop count.

## APPROACHES TO GOLF COURSE WATER CONSERVATION

**Improving irrigation efficiency:** Some people incorrectly assume that if the sprinklers are turning and water is coming out of the nozzles, then everything is fine. In reality, such a system can be wasting a significant amount of water because of worn or inefficient nozzles, head spacing, fluctuating pressures, or lack of precise timing and controls. Despite sophisticated engineering and advances in irrigation technology, the rotary sprinklers typically used on golf courses are incapable of providing 100% water distribution uniformity (DU). Rotary sprinklers are listed in three DU categories by the Irrigation Association's Certified Golf Irrigation Auditor manual:

- 80% DU is considered excellent (achievable).
- 70% DU is considered good (expected).
- 55% DU or less is considered poor.

Obviously, the lower the uniformity, the longer the system must be operated to adequately irrigate all areas within a given zone, resulting in wasted water and energy. Performing a water distribution audit can identify problem areas so



that appropriate improvements can be made. Audits can be done by a Certified Golf Irrigation Auditor, or superintendents can perform their own audits. A key aspect of the audit is a catch-can test, in which calibrated plastic receptacles are placed in a grid pattern approximately 12 to 15 feet apart and each sprinkler in the zone is operated a minimum of 15 minutes. After recording the amount of water in each receptacle, it is possible to analyze the data and calculate the distribution uniformity within a particular zone. Then adjustments can be made to the system, including the replacement of nozzles or the adjustment of pressure regulators. A two-year survey of six golf courses performed by the Center for Irrigation Technology documented an average water savings of 6% per year simply by replacing sprinkler nozzles.

**Improving soil properties:** When water resources are limited, it is more important than ever to focus on basic maintenance programs to improve soil properties so that every drop of

water can be used by the turf. Routine aeration along with the use of appropriate soil amendments or wetting agents will insure good water infiltration and minimize runoff.

**Reducing irrigated acreage:** Another strategy is to eliminate irrigation in out-of-play areas. Considering that the rough comprises approximately 50% of the total golf course acreage, it makes sense that a significant amount of water can be saved by restricting irrigation to



Considering that the rough comprises approximately 50% of the total golf course acreage, it makes sense that a significant amount of water can be saved by restricting irrigation to primary playing areas. This is easier to do at courses with a well-designed irrigation system that provides single-head control and part-circle sprinklers along the edge of the fairway or primary rough.

primary playing areas. This is a necessary policy, but it can be unpopular with homeowners next to a golf course who may have paid a premium to live next to lush, well-manicured turf. Reducing or eliminating water in sections of the course while maintaining an acceptable appearance is easier to do at courses with a well-designed irrigation system that provides single-head control. Replacing full-circle sprinklers with part-circle heads along the edge of the fairway or primary rough can further reduce the total amount of water applied. It also is important to have a priority plan that details where irrigation will be eliminated on the course if severe water restrictions are imposed. The following is a suggested list of priorities for irrigation:

1. Greens.
2. Green banks.
3. Fairway landing zones.
4. Tees.
5. Remaining sections of fairways.

6. Primary rough and trees.

7. Secondary rough.

**Establish low-water-use grasses and plants:** Turfgrass breeding and research efforts over the past 15 years have focused on developing grasses with lower water-use rates. Unfortunately, new and established courses have been slow to take advantage of these improved grasses and incorporate them into golf course design. One way to get a firsthand look at these grasses is to establish a new variety on a par-3 fairway or section of the practice range so golfers can see and play on the grass while the superintendent becomes comfortable with management practices. Demonstration plots using native grasses and low-water-use plants also can be established behind tees, on hillsides, or other out-of-play areas and gradually incorporated in other areas of the course. In some cases, local water agencies are offering rebates to golf courses to replace turf with low-water-use plants in out-of-play areas. While most of the native grasses and plants use less water, they can be slow to establish and may require extra labor for weed control for the first few years after planting.

Another important issue that needs to be addressed is winter overseeding, which uses extra water but is viewed as an economically essential practice at desert resorts. Already, a few courses in Las Vegas and Phoenix have taken the bold but necessary step of suspending winter overseeding to conserve water. As a compromise, other courses are considering limiting overseeding to tees and fairways.

**Explore the use of recycled water:** Drought intensifies the need to investigate other sources of water. While there is still a “yuck factor” associated with recycled water, it is nonetheless a suitable source of water for most turfgrasses. Many courses would welcome access to recycled water, but the main impediment seems to be the expense and disruption caused by the installation of large delivery pipes. One way to overcome this roadblock is the construction of smaller on-site water reclamation facilities at golf courses, an emerging trend in California.

**Focus on managing and documenting irrigation practices:** A restricted water supply places additional emphasis on maintaining and managing the irrigation system for maximum efficiency. Raising and leveling low sprinklers, repairing leaks, eliminating irrigation overspray, along with monitoring and adjusting the control



system on a daily basis, should be given high priority. Some superintendents make irrigation decisions based on feel rather than an objective analysis of weather station data and soil moisture levels. A more disciplined approach to irrigation scheduling will be needed as restrictions are imposed. It also is important to keep accurate water-use records to justify irrigation decisions now that regulators are carefully scrutinizing golf course irrigation activities.

### MANAGING GOLFER EXPECTATIONS

Many people equate golf course quality with lush green turf conditions. Keeping the entire course lush and green is not realistic during times of drought, but that does not mean the golf course is unplayable. While managing golfer expectations can be a challenge during times of drought, there are several things that can be done to re-educate golfers about water conservation and playing conditions:

- Golf professionals, marshals, superintendents, and any other staff members who have contact with golfers should steer conversations toward playing conditions, not turf color. Prominent championships, such as the British Open, are often played at courses with less than eye-popping green conditions, yet the playing surfaces are fast, true, and challenging.
- Establish demonstration holes on the golf course where irrigation is applied at various conservation levels, such as 60%, 70%, and 80% of ET, to give golfers a firsthand look at water conservation options. Small, professional-looking signs can be placed near demonstration plots to inform golfers of your experiments.

- Provide ample information about any water restrictions in your area and what you are doing to conserve water. In this way, golfers realize that brown spots or discolored areas of the course are not the result of neglect or mismanagement but rather a carefully planned effort to conserve water.
- Share information with golfers, neighbors, and your community on how they can save water on their lawns and gardens.

Whoever said you need green grass to play golf? People will still find a way to enjoy the game despite severe water restrictions in some areas.

### CONCLUSION

Recovering from the drought in the Southwest will require several years of above-average rainfall to restore water levels in Lake Mead and other prominent reservoirs. As a result, water conservation measures and limited turfgrass irrigation may become a way of life for many golf courses in the region. This can be a difficult time for policy makers and golf course superintendents, but prudent conservation measures can insure that every drop of water is used efficiently and nothing is wasted.

### REFERENCES

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*PAT GROSS is the director of the Southwest Region of the USGA Green Section. He visits golf courses in California, Nevada, and Mexico, where water quality and irrigation issues are a major concern.*