

Coping With the Water Shortage

The Irrigation System

A well-designed, correctly-installed and properly-utilized automatic irrigation system provides the best means of conserving water. Water savings of 40 to 75 per cent have been documented on golf courses which converted from a manual to an automatic system. However, regardless of the type of irrigation system available, it should be operating at peak efficiency. Steps should be taken to increase its efficiency if the situation permits.

- Repair all leaks.
- Check nozzle size as it relates to available pressure and resulting coverage.
- Check for nozzle wear.
- Where necessary, relocate heads to improve water distribution.
- Use half-circle sprinklers where applicable.
- Check pump performance and other pumphouse systems.

Irrigation Practices

Proper use of the irrigation system is one of the most important factors in conserving water. Preparing turf for hot summer weather requires that little, if any, irrigation water be applied during the spring. Encourage the turf to establish a deep, fibrous root system in the spring by allowing the soil to become dry between rains and/or irrigation sessions.

- Before irrigation, use a soil probe to determine existing soil moisture and rooting depth.
- Apply water as uniformly as possible, depending on soil conditions and plant needs.
- Apply water only as fast as the soil can accept it. To avoid puddling and runoff, use short, repeat cycles or else cultivate the soil (core, slice, spike) to improve water infiltration.
- Irrigate when there is little wind and when the temperature is relatively low, usually at night.
- Hand-water critical areas if it can prevent over-watering adjacent areas.
- Constantly monitor the system to ensure that all heads are operating as they should be.

Cultural Programs

- Aerification — aerate (core) turf areas during the spring in order to relieve soil compaction, promote root growth and improve water infiltration (note: concerns about *Poa annua* encroachment after spring aerification are of secondary importance when drought stress may place the survival of the turf in jeopardy).
- Cultivation — spike and/or slice turf areas when weather permits throughout the season so that good water infiltration is maintained.
- Fertilization — use relatively low rates of nitrogen fertilizer. A lush, fast-growing turf uses more water and is more susceptible to injury from other stresses. Coordinate application with predicted rains or apply during light rains.
- Diseases and Insects — avoid turf damage from diseases and insects by utilizing a proper pest-control program.
- Weeds — apply herbicides in the spring for weed control only if large numbers of weeds are present (broadleaf) or can be anticipated (crabgrass). If spraying must be done, spot-treat the worst areas rather than making a blanket application.
- Cutting height — if possible, raise the cutting height and reduce the mowing frequency on tees, fairways and roughs. It is unlikely that much benefit will be derived from raising the height on greens already cut at 3/16" - 1/4".
- Thatch control — if excessive thatch is a problem, then thatch control measures (aeration, spiking, slic-

ing, verticutting) and wetting agents should be utilized on a regular basis.

• Overseeding — on turf areas composed primarily of *Poa annua*, plans should include overseeding during late summer or early fall with a more drought-tolerant grass species. Turf areas which cannot be irrigated during the summer will likely require renovation during the fall.

Reduce Other Stress Factors

Avoid placing turf under any unnecessary forms of stress. A healthy, vigorous turf is much more likely to survive the drought if other stress factors can be reduced or eliminated.

• Cart and foot traffic — distribute traffic across the turf as uniformly as possible. Eliminate traffic on important play areas when possible by keeping carts on paths, by banning cart use on certain days or weeks during the season, and by careful traffic monitoring.

• Drainage — good drainage, even during a water shortage, is a pre-requisite to good turf. Turf in poorly drained areas is usually shallow-rooted and weak. Work on drainage installation anytime weather permits.

• Weeds, Insects, Diseases — as noted above, eliminate competition and injury from weeds, insects and diseases by following proper pest-control programs.

• Trees — trees can weaken turf by preventing good air circulation and creating excessive shade, and tree roots can compete with turf for available moisture and nutrients. When possible, improve sunlight penetration and air circulation by thinning trees or their branches. Root-prune trees near tees and greens to reduce moisture stress in these areas.

• Wind barriers — though not practical in most instances, the establishment of wind barriers near exposed sites can help to reduce evapotranspiration water losses.

Establish Priorities

When water use is restricted, based on either a percentage of previous use or on an absolute quantity per facility, it usually becomes necessary to set priorities for which areas of the course will receive the specified allotment. When this occurs, the following priorities are usually established.

1. Greens and collars
2. Tees
3. Approach areas
4. Landing zones
5. Other fairway areas
6. Roughs

Investigate New Sources of Water

When water rationing is imposed, the hardest hit is often those golf courses which utilize municipal or public water supplies. Therefore, it usually pays a golf course to establish alternative sources of water for future use. Among the options are:

- Creating new ponds or enlarging existing ponds and reservoirs to hold large quantities of water which can be diverted from streams, wells, catch basins or other bodies of water.
- Digging wells to supply water directly to the irrigation system or to existing ponds or reservoirs.
- Dredging existing ponds, canals and reservoirs in order to increase their capacity.
- Investigate using sewage effluent for irrigation purposes.
- Collecting and funneling runoff water, water from air conditioners, shower water and pool water into existing ponds.

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