

## ACSP: Part IV

In Part 4 of this series on the Audubon Cooperative Sanctuary Program for Golf Courses, ideas for fulfilling the *Water Conservation* category are presented.

- ✓ Environmental Planning
- ✓ Member/Public Involvement
- ✓ Wildlife & Habitat Management
- ✓ **Water Conservation**
  - ❑ Water Quality Management
  - ❑ Integrated Pest Management

adjustment will also be large-scale acceptance and usage of reclaimed wastewater. The goal is to save high-quality ground water resources for usage by the masses.

What this leads to is a shrinking of the water resource pie we currently use for irrigation. When the pie shrinks, we must turn inward to cope and deal with the problems encountered by managing turf under different attitudes.

Most of us practice some aspect of conservation on a daily basis. The use of computerized irrigation systems, utilizing weather stations, installing moisture sensors or automatic pump shutdown switches in the event of significant rainfall are all excellent examples of water conservation.

Each and every day that we make an analysis of the golf course to determine the irrigation needs, we are not only practicing sound turf management principals, but subconsciously we are also applying conservation measures.

We know conservation will be a major part of golf course life in the coming years. Our goal at this point should be to work diligently with the water agencies to position our industry at a sustainable degree of certainty for tomorrow.

## Irrigation Practices



*Irrigation weather station monitors conditions and adjusts run times.*

## Water Conservation and healthy turf are compatible

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At Collier's Reserve, water conservation is a top priority. Beginning with the irrigation system design, selecting the best equipment available, and controlling water frequency, we are intent on maximum efficiency and minimum energy use and maintenance, as well as optimum water conservation.

Incorporating sound Integrated Plant Management (IPM) and agronomic practices, we keep a healthy turf, which translates into water conservation.

### **Irrigation System Design Golf Course and Common Grounds**

The irrigation system at Collier's Reserve is a state-of-the-art, computerized prescription irrigation program and is controlled through a weather station.

Run times are calculated daily by the weather station which monitors and compares evapotranspiration (ET) rates and automatically sets each head's run time for that day. The computer program allows each head on the golf course to be manually fine tuned for irrigation cycles if adjustments are needed for wet or dry areas on the course, and delivers only the amount of water needed, where it's

needed. This keeps the turf healthier and results in water and energy conservation.

The system is a low-volume water delivery system. Its reduced water pressure cuts down on wind drift, misting and possible irrigation line breaks. Sprinkler heads throughout the course were individually staked to insure maximum coverage while avoiding throwing water into native plant areas, pine tree beds, preserves and lakes. Part- and half-circle heads throw irrigation water from the outside of the roughs to the inside of the fairways.

Historically, fairway irrigation designs would place heads in the middle of the fairways with water patterns throwing to the outside. The initial cost of a system like Collier's Reserve's is greater in design and construction, but the finished product produces exact coverage on the target turf areas.

At Collier's, we added 250 irrigation heads to the original design, at an approximate additional cost of \$120,000. However, we will realize a 20% reduction in water and energy costs which will reap tangible and intangible benefits.

Projected pumping costs for both pumpstations combined, in 1995, is approximately \$16,000. Off-peak pumping contributes to this low figure.

### Greens and tees

Greens heads are individually set and controlled which allows heads to irrigate in varying amounts, depending on slopes or low areas on the greens. All heads are half-circles, or adjustable, and irrigate only the greens. This is a benefit because you do not irrigate greens' slopes or approaches when watering-in a product or during the normal irrigation cycle.

The tee complexes are designed to support native grasses on three sides of the tee slopes and turfgrass on the fourth side. Cost savings are realized in maintenance and water because the native grasses do not require irrigation or hand labor — except to pull the few weeds which emerge through the tight canopy of native grasses.

Irrigation heads on the tee tops are more site specific and smaller because they do not irrigate large areas, such as tee

slopes, which require larger heads. Again, we realize water and energy savings.

### Equipment – Pumps

The highest quality premium efficiency pump motor with variable frequency drive (VFD) was selected to run the irrigation system. The pumps are 2% more efficient than any other pump available at that time. Because the property is separated by the Cocohatchee River, two pump houses were built; one on each side of the river.

Twin, premium-efficiency motors, driven by VFD's were installed in each pump house.

The VFD's expend only the energy required to meet the demands of the pumps. For example; if only 40 GPM (gallons per minute) is demanded, the VFD supplies only the energy needed to provide 40 GPM. We have already seen reduced costs due to energysavings from efficient irrigation pumps.

### Irrigation Frequency

During most of the year, we water every other day, except greens. If weather conditions are favorable (i.e. rain, cool weather) we may skip several irrigation cycles. There is no set schedule for watering greens. Greens are checked daily by the Integrated Plant Management (IPM) Specialist, the Cup Cutter, and myself. We check moisture, root structure, etc. When watering is done on the greens, we water deeply enough to wet the entire root zone. We also monitor and hand water any "hot spots" on the greens on a daily basis. Our goal is to have 100 non-irrigation days per year at Collier's Reserve.

### Other Irrigation

Newly-planted trees and native vegetation on the golf course and common grounds have low volume drip irrigation which will be removed when the new plantings are fully established.

### IPM and cultural practices

At Collier's Reserve, we follow specific Integrated Plant Management (IPM) guidelines. Coupled with sound agronomic practices, we strive to produce the

healthiest turf possible. A strong healthy turf will by itself greatly conserve water.

By controlling weeds, pests, disease, and using the proper fertility levels, you increase the turf's vigor.

We control the cart traffic which helps eliminate turf compaction on the fairways and roughs. When compaction does occur, aerification of the turf helps restore it. We have a testing program schedule for soil, grass tissue and our irrigation pond water quality.

Acid injection helps control high water pH and bicarbonate levels and can increase the efficiency of our irrigation water.

Water conservation must start with the pump stations and be carried through by checking every sprinkler head to ensure a properly working system.

Past routines of watering every other night or sometimes every night to keep the golf course green "wall to wall" have been reevaluated. We may let the turf go unwatered one more night if it appears to be on the border of needing water; thus begins true water conservation.

You not only conserve water, energy and wear and tear on your irrigation system, but will strengthen the root systems on the turfgrass plants.

Caution: If you let the soil become hydrophobic, you will need excessive water to restore proper or desired soil moisture levels.

### Summary

Not only is it wise to have a state-of-the-art irrigation system with the hardware and software to support it, it must be a well-managed and maintained system. Understanding the philosophy of IPM and water conservation principals are essential for a successful water conservation program.

Although a state-of-the-art irrigation system may initially cost more, with the proper management, these extra costs will eventually be recovered. Combining a modern, well-designed irrigation system, and using sound IPM and agronomic practices, you can be assured of a successful water conservation program for your golf course.