

# Irrigation Equipment

## *Irrigation equipment and sound water management practices*

BY SCOTT MORGAN

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The golf course superintendent's responsibility is to use the least amount of water necessary to fulfill customer's minimum playability and aesthetic expectations, staying within budget and regulatory guidelines.

Golf course irrigation equipment manufacturers are tasked with supplying tools to help the superintendent satisfy this challenging responsibility. Irrigation equipment manufacturers strive to fulfill this commitment every day. Their focus may not be aimed directly at water conservation. Instead, manufacturers promote responsible water application indirectly through product development that is sensitive to the golf course superintendent's role.

Manufacturers perceive that golf course superintendents employ sound water management practices and superintendents have always wanted irrigation equipment manufacturers to support these intentions with appropriate products and services.

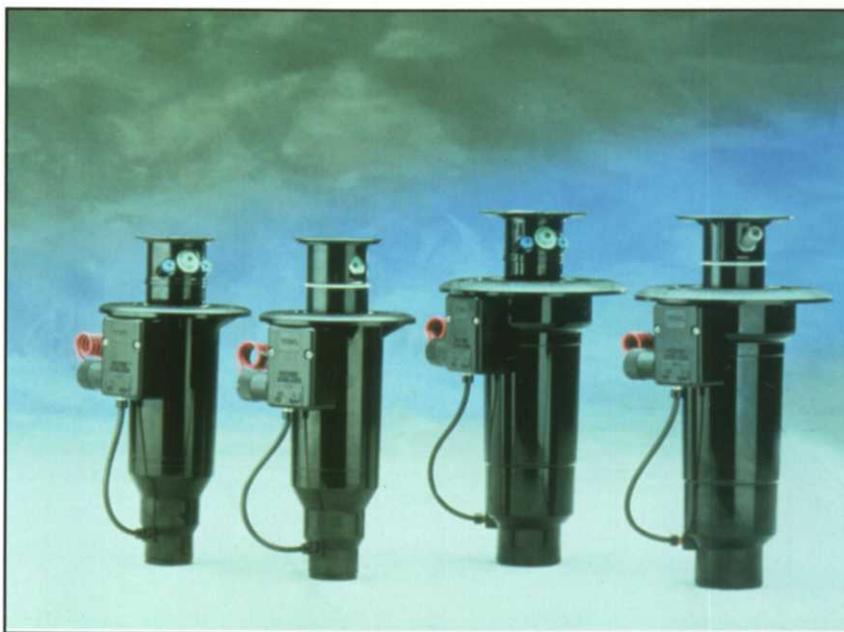
Simply stated, sound irrigation management is the application of the correct amount of water when and where it is needed.

What is the correct amount of water? The current standard in the industry is evapotranspiration (ET). ET is an agronomic measure of a plant's need for water due to evaporation and the plant's own transpiration. Irrigation equipment manufacturers have developed central control systems based entirely on ET.

These systems calculate the projected water need of plant

materials on a golf course based on ET, rainfall, plant type, soil types, soil compaction, terrain slope, geographic location and pH factor.

When do you apply the correct amount of water? We all know golf courses have very specific times when water can be applied. Generally, manual watering and syringing are the only daytime irrigation activities on a golf course.



*Modern sprinkler heads can conserve from 25 to 50% of their previous usage.*

The summer irrigation window for a typical golf course is eight to ten hours, which seems ample. However, if there are 1,200 sprinkler heads on a golf course with average sprinkler precipitation rates of approximately .7 inches per hour, average water demands of 40 gallons per minute per sprinkler, an ET replacement target of .21 inches per day, and a targeted water usage from the pump station of 1500 gallons per

minute, the absolute best you can do is a 10-hour watering window.

Because of these limitations, irrigation equipment manufacturers have loaded features into their control systems to support complex irrigation schedules.

Where do you apply the correct amount of water? Thirty years ago, certain manufacturers perceived that their customers wished to individually control each sprinkler head on their golf course. The valve-in-head sprinkler was created to allow the superintendent to manage every point of irrigation application.

Combined with control innovations such as solid-state field controllers and personal computer-driven central controllers,

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valve-in-head sprinklers offer the most precise water applicator feasible at this time.

We may conclude that valve-in-head sprinklers, sophisticated scheduling features and ET-based central controllers are adequate tools to support sound water management. However, irrigation manufacturers feel there is ample room for technological innovation and improvement.

First and foremost, irrigation manufacturers understand that their products need to be easy to install. Sound water management cannot be supported by the latest technologies if those technologies are problematic to install. Irrigation manufacturers will continue to invest in radio technology, which eases installation problems and hastens system upgrades.

In fact, some manufacturers will search out or intensify strategic alliances with companies that already supply state-of-the-art radio solutions to other industries.

Second, even with a sophisticated central control system, sprinkler heads need to apply water evenly, causing manufacturers to continually improve water distribution. Assuming that a control system supplies adequate tools for sound irrigation practices, the most important component of an irrigation system is the sprinkler head.

For example, some manufacturers can now produce sprinklers with scheduling coefficients (the application rate multiplier used to insure that the area of a sprinkler's pattern that gets the least amount of water is sufficient to replace water consumed by ET) of 1.2. Scheduling coefficients of sprinklers have improved from an industry norm of 2.0 - 2.5 to a current industry norm of 1.3 - 1.5.

That means that golf courses that employ the latest sprinkler technology automatically conserve at least 25% (and up to 50%) of their previous water usage and reduce waste by 50%.

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Finally, central irrigation system software needs must be intuitive to the system user or the system will not fulfill its potential. Irrigation equipment manufacturers do not have intrinsic expertise in software development.

However, they do understand that superintendents have very specific control needs. The challenge before irrigation manufacturers today is to translate control needs into more understandable central software systems. New developments in central software will continue the progression toward a more consistent and intuitive user interface.

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# Recycled Water

## Treated Effluent as an Irrigation Source

BY RON ANDREWS

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Whether you are gearing up an irrigation system for a new golf course, trying to find another water source, or simply up for renewal on your consumptive use permits, it is likely that the subject of effluent irrigation will arise.

Treated sewage effluent, or reuse water as it is commonly known, is becoming available on a much wider scale than it has been in the past. Sewage plant operators are coming under much greater pressure to dispose of effluent water in the most environmentally appropriate manner.

Direct discharge to state bodies of water, long a common practice, is no longer a preferred choice. Plant operators are also finding mounting pressure on deep well injection disposal systems. Both of these methods have had the sling and arrows of pollution watch guards launched at them.

The two modern alternative disposal methods that are receiving the most attention are reuse as an irrigation source and the recharging of systems of artificially created wetlands linked to state water bodies.

Each of these methods has its advantages and both are likely to impact golf courses. For new golf course developments with home sites, this pressure to find better disposal methods will cause plant operators to force these communities to take back the treated effluent that is generated from the sewer tie-ins. This is one of the reasons Grand Harbor uses effluent water.

As more pressure comes on plant operators to dispose of treated effluent through irrigation re-use, they are naturally going to look to all properties with large consumptive uses. To many this means golf courses. Never mind that golf courses don't use the quantity of water that many people think they do.

Also, do not expect plant operators to market their water as something that they need to dispose of. No, more likely it is now a valuable resource for which you should be willing to pay. Perhaps it is, but there are a lot of complicated issues when it comes to irrigating with effluent.

The intent of this article is to discuss these issues from the point of view of a golf course operation that has used effluent for several years.

The first thing you need to consider is what your water sources are now. You are a much better candidate for effluent irrigation if you are using a non-renewable or a potable water source as part of your irrigation programs. At Grand Harbor, the bulk of our irrigation water comes from a system of storm water treatment lakes and wetlands.

Such a system is already a highly efficient re-use strategy that