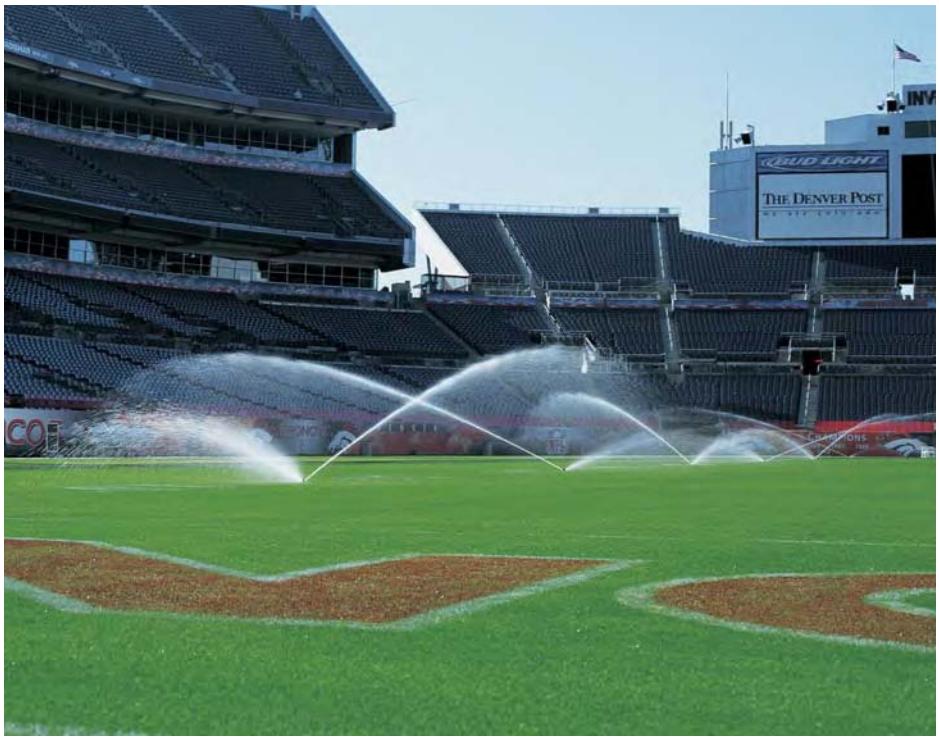

Effective irrigation scheduling

Editor's note: *The author is the marketing manager for Hunter Industries.*

HAVING AN EFFECTIVE IRRIGATION SCHEDULE established for the upcoming season is not only useful to help manage water and pumping costs, but also to help reduce disease, fertilizer use, runoff, and erosion. An effective schedule contributes to healthier turf, greater playability, and more importantly, increased safety. The creation of irrigation schedules have matured in many ways from the old methods of arbitrary runtimes for spray and rotor zones, to using full water audits, soil analysis, and daily, automatic sprinkler run time adjustment for evapotranspiration rates (evapotranspiration is the measured combined loss of water from soils by evaporation and plant transpiration) calculated by onsite weather stations. While these newer scheduling methods are more efficient, many turf managers may lack the resources and experience to develop highly efficient irrigation schedules.

Among the variety of solutions for irrigation scheduling are "smart controllers" offered by many manufacturers that can help assist with daily irrigation scheduling adjustments. Smart controllers are irrigation controllers that have the ability to adjust the daily irrigation run times based on the weather conditions. These smart product offerings vary greatly in cost and complexity. Some manufactures offer simple add-on weather sensors that provide true onsite weather data that may be compatible with existing field controllers. Other more complex solutions may require existing field controllers to be replaced and add monthly subscription costs to supply the daily weather information from distant weather stations to the site. While smart controllers can be useful tools to achieve greater efficiency in irrigation scheduling, they first require an accurate assessment of the site. Another consideration is that weather-based controllers often times need significant initial observation and adjustment before optimal performance is achieved.

>> **Below: ROTARY SPRINKLERS** can be high efficiency sprinklers, designed for safety and reliability for sports fields of all types.

Educational resources and networking opportunities:

There are many knowledge bases in the irrigation industry that can assist with the education and consulting of an irrigation system. The following websites offer different educational resources and networking opportunities:

- http://www.water.ca.gov/wateruseefficiency/landscape/
- www.irrigation.org **(Irrigation Association)**
- http://www.atinet.org/cati/cit/ **(Center for Irrigation Technology, Fresno)**
- http://www.asic.org **(American Society of Irrigation Consultants)**
- http://www.stma.org/ **(Sports Turf Managers Association)**

MOISTURE SENSOR OPTIONS

Another option to assist with irrigation scheduling is the use of moisture sensors. Typical systems using moisture sensors have one or more sensors placed in the rootzone of the irrigated area. These sensors will either inhibit or shut down an irrigation cycle once optimal soil moisture levels are present. A simple tool to use as a reference of the level of soil moisture is the tensiometer. These devices are installed in the rootzone similar to moisture sensors, but provide a gauge that can be visually referenced for the status of soil moisture.

Regardless of any technologies being employed, it is important to note that having an efficient system is paramount to effectively using your limited water resources. It is a good idea especially on older systems to perform a tune-up before addressing scheduling concerns. During this site inspection the system should be checked for damaged and leaking heads and to ensure heads are level and unobstructed. At this time the pressure should also be checked at the nozzle to verify the optimum manufacturer pressure recommendations are met. If the pressure is too high, pressure regulation at the valve should be considered since high pressure can hamper efficiency just as badly as low pressure. If low pressure is observed refer to manufacturers nozzle data. Often smaller nozzles can be used to help reduce flow and restore pressure and nozzle efficiency to the system.

GOING MONTHLY

An irrigation schedule should be created for each month of the growing season. This will serve as a base schedule that will typically require only minor adjustments with the exception of extreme weather events like prolonged rain or above average heat. The first step in this process is to collect historic or average evapotranspiration rates for the local area. This data can often be accessed through a water purveyor website or by an internet search for the best available local source. Once this data is gathered, you can derive how many inches of irrigation water is needed by plant type. The irrigation schedule would then be built to replace this lost moisture.

An additional consideration of the efficiency of the irrigation system components also plays a role. Since no irrigation system is 100% efficient, additional irrigation will need to be applied to compensate for the difference between the plants needs and the ability of the irrigation equipment to apply the water. As a general rule, rotary sprinklers range in efficiencies from excellent at 80% or higher, to a general average in the 70% range. Spray sprinklers tend to be less efficient than rotary with the high range being 60% and an average around 50%. Many systems with pressure, flow, and maintenance issues can fall well below these averages. Irrigation system audits are highly recommended to understand true system efficiency. Often times, the cost of a full water audit will provide a reasonable return on investment through potential irrigation scheduling water savings.

Soils can be thought of as your water reservoir and soil type plays a significant role in determining how often and to what duration irrigation needs to be applied. For example, sandy soils do not offer as much water holding capacity as a clay soil. However, sandy soils are able to absorb water being applied over a longer period of time before irrigation run off begins to occur. Clay soils are the opposite, and generally require several short sprinkler run times before the desired amount of water is applied to the rootzone. Simply running the irrigation system and observing the amount of run time until runoff occurs is a useful way to help determine the length of irrigation run time your soil can handle.

An important note to consider when determining sprinkler run times is that soils generally have a high initial intake rate that will drastically decrease, especially as you approach the soils water holding capacity. It is important to keep in mind plant roots do not seek water; rather only grow where water is present and your irrigation schedules should be designed to provide more infrequent, deeper watering cycles. Frequent, short irrigation cycles typically only provide moisture in the first few inches of the soil. This will create a shallow moisture reservoir and lead to shorter rootzones and less drought tolerant turf.

As you prepare for your upcoming growing season, assess and repair the irrigation system at spring start up and generate an expected monthly irrigation schedule based on your local evapotranspiration rates. If your budget allows, strong consideration should be made for employing irrigation system audits and new technologies like smart controllers or to help achieve optimum water savings for greater safety and playability.

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- http://www.stma.org/ (Sports Turf Managers Association) ■

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>> **PRESSURE REGULATION** at the valve can immediately solve high pressure issues that can lower sprinkler performance. Hunter's Accu-Sync pressure regulator shown here.