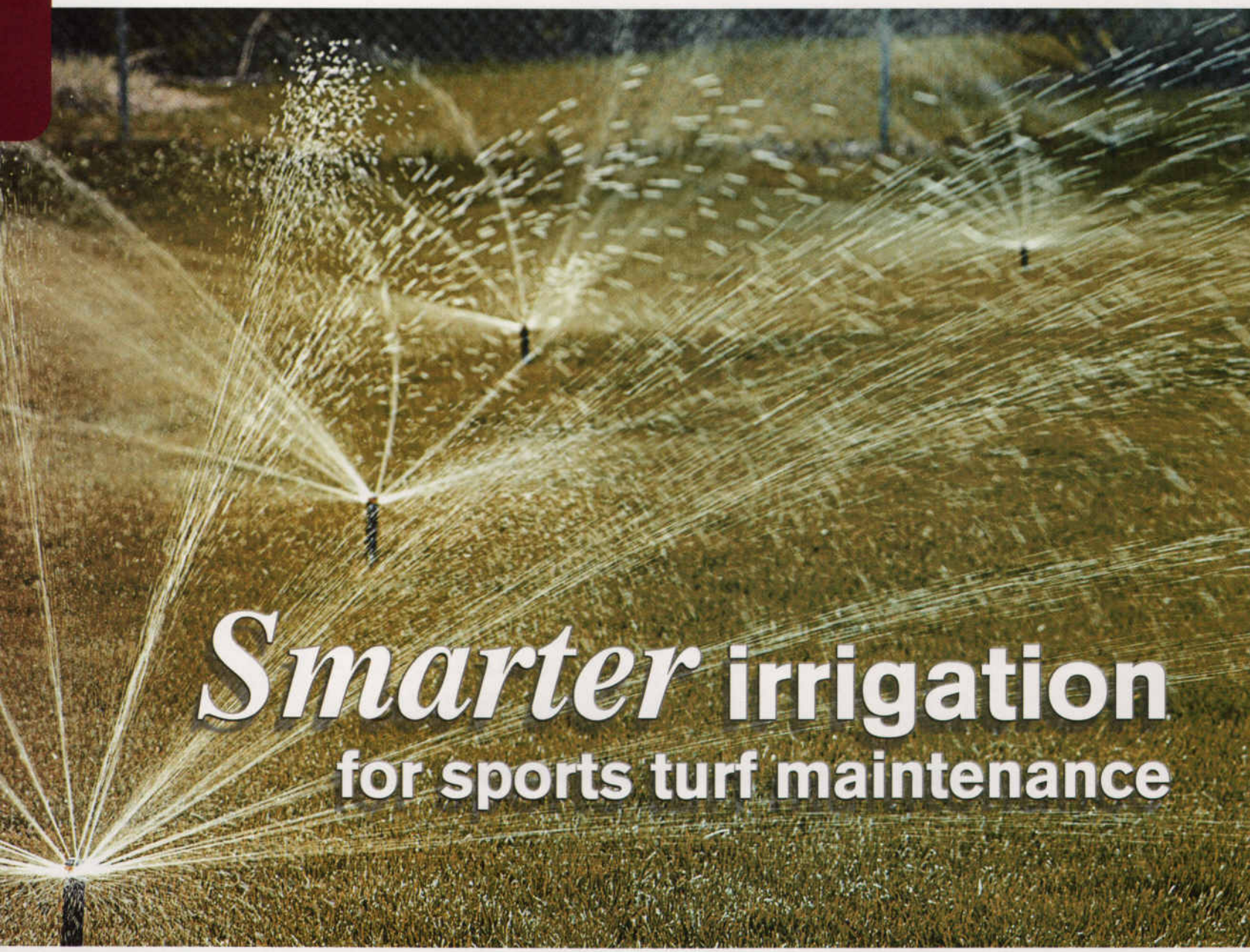

Smarter irrigation for sports turf maintenance

By Laura Cochran

A properly designed irrigation system is necessary to keep most sports field turf in beautiful, healthy condition. However sports field managers are often faced with tight maintenance budgets, watering restrictions, playability concerns, and unique design considerations that can make irrigation a challenge. But more efficient irrigation products can maintain safe, beautiful fields with less water. Both rotating spray nozzles and pressure regulating rotors can be used to improve an irrigation system, so it's important to understand how these products work and how to effectively integrate them into an irrigation system with minimal hassle and expense.

In the past, rotors were lauded for better use of water and more even coverage. Conventional spray nozzles, on the other hand, are known for their shorter radius, high precipitation rate and large gallons per minute (GPM) requirements. Fixed arc conventional spray nozzles are an improvement over variable or adjustable nozzles because they have matched precipitation rates (MPR) across sets and patterns, allowing users to mix and match different nozzle patterns and radii while maintaining consistent watering.

Rotors are most often used on sports turf, but many fields need sprays to irrigate common areas beyond the playing field. For example, the small turf areas outside the baseline of a baseball field are typically too small for rotors

to be very efficient; rotating spray nozzles are an excellent alternative. Rotating spray nozzles are also a water-efficient choice for irrigating smaller landscaped areas outside the stadium or ballpark.

While conventional spray nozzles with MPR are still a better choice over variable arc nozzles for improved water efficiency, new rotating spray nozzles take that concept to the next level. Rotating spray nozzles also feature MPR and are more efficient then conventional spray nozzles due to their lower precipitation rates and improved close-in watering. Additionally, they cover larger areas with radius ranges above 15 feet. Combined, these nozzles are an ideal solution to expand spray areas, save water and improve turf life and health.

Precipitation rates

It is important to pay close attention to precipitation rates because they determine how much water is distributed by each nozzle over a given period of time. Generally, the lower the precipitation rate, the less water wasted through over-watering and run-off. More specifically, low precipitation rates allow time for water to percolate into the soil and reach roots before running off or evaporating. Through this practice, they promote better root growth and result in healthier plants and landscapes.

For example, conventional spray nozzles' precipitation rates are higher than those of rotors or rotating spray nozzles. If run times are not programmed properly, or you if have "clayey" soil, high precipitation rates can cause flooding, especially if a product with a high precipitation rate is installed on the same zone as rotors. However it's also important to select products with precipitation rates that meet watering windows; precipitation rates that are too low can increase the amount of time required to water each zone.

Rotating spray nozzles fit on standard spray heads like conventional spray nozzles. They are most often recognized by their individual rotating streams. A rotating spray nozzle covers larger areas (greater than 15 square feet), distributes water more evenly and provides better close-in watering at the head than conventional sprays. The combination of these features eliminates dry spots, saves water and reduces need for maintenance. The lower precipitation rates of rotating spray nozzles range from 0.4 inches/hour to 0.6 inches/hour, depending on manufacturer. This is a significant difference when compared to conventional spray nozzle with rates ranging from 1.58 inches to 2.08 inches/hour depending on pressure.

It takes only up to 0.8 GPM to cover the same area—less than half the amount required by conventional spray nozzles at 1.85 GPM. And because they have better distribution uniformity due to their individual rotating streams and larger water droplets, rotating spray nozzles take less water to maintain healthy turf than traditional spray nozzles. Not only do rotating spray nozzles provide better coverage, they also save money through the installation of fewer heads that can cover areas that are the same size or even larger.

Additionally, you can save money on valves and labor through larger spacing and the installation of fewer spray zones than in the past. Precipitation rates for rotating spray nozzles can vary slightly from manufacturer to manufacturer, so pay close attention when selecting nozzles for a new install or system upgrade. In parts of the country where small zones are the rule and water windows are tight, even a slightly higher precipitation rate can have a noticeable impact.

While their water-saving benefits are extraordinary, low precipitation rates also make rotating spray nozzles a great tool for irrigating not only sports turf, but also slopes and hard-soil landscapes where water is often lost to run-off or evaporation. Although sports fields are designed with very minimal slope, most do contain at least a bit of an incline, which can make a big difference in the type of irrigation products that should be incorporated.

You can save money on valves and labor through larger spacing and installing fewer spray zones

For example, even a seemingly negligible slope of 0.5% on a baseball infield can cause irrigation water to puddle if the precipitation rate is too high. Plus, soil compaction caused by the repeated pressure of athletes running on the turf can make fields particularly susceptible to "ponding." Fortunately, the technology behind the nozzle's rotating streams provides more even distribution across the entire pattern than conventional spray nozzles. This eliminates overwatering while still ensuring that the driest areas are sufficiently watered.

Making the right choice

Many turf managers are puzzled by the differences between the rotating spray nozzles offered by different manufacturers. The primary differences between brands typically lie within the precipitation rate and cost. Rotating spray nozzles were an expensive technology in the past, which discouraged widespread upgrading to this water-efficient, money-saving technology. However, as rotating spray nozzle technology

has become more widely used and accepted, prices continue to trend downward. This reduction in price offers sports turf managers the ability to incorporate the use of more affordable water-conserving products and protect a precious resource, a huge advantage for community sports fields that are often under scrutiny for their irrigation practices.

While precipitation rate and cost are important considerations when selecting a rotating spray nozzle for your particular application, so is design-flexibility. Some rotary nozzles and rotors are designed to have the same precipitation rate (0.6 in/hr), so a single zone can be designed for areas covering 13 to 35 feet. This enables your field to benefit from the strength and performance of a rotor at the larger radius, enhanced by the lower cost and simplicity of sprays with rotating spray nozzles at the shorter radius.

The significance of this type of design flexibility becomes very apparent considering that some of the most efficient rotors on the market today can actually reduce water usage by 15-45% over their less efficient counterparts. When combining this type of rotor technology with rotating spray nozzle technology, sports turf managers can experience a significant savings on their water bills.

These savings are realized through using pressure regulation at the rotor's stem, commonly found in commercial grade sprays. Pressure regulation at the stem (often referred to as "PRS") saves water by eliminating head-to-head pressure variations and misting due to high pressure while improving nozzle distribution uniformity by operating the nozzle at its optimum pressure. Information on these rotors and a variety of other water-saving irrigation products has been compiled by Smart Approved WaterMark, an Australian program dedicated to guide users of irrigation to choose products providing the highest level of water efficiency. For more information, visit www.smartapprovedwatermark.com.

Using water intelligently will continue to be of utmost importance as natural resources grow increasingly scarce and the general public continues to focus on environmentally friendly living. Switching to rotating spray nozzles for small areas around your field can make your entire system perform more efficiently through lower precipitation rates and the even distribution of rotating streams. With lower maintenance and installation costs through ability to zone with rotors, rotating spray nozzles can save time and money while improving the health, beauty and safety of your turf. ■

Laura Cochran is rotary nozzle product manager for Rain Bird.