Water-saving tips for sports fields

Editor's note: *The author is Rain Bird's area specification manager for the Southeast region.*

THERE ARE MANY WAYS that sports turf managers can save water while still keeping their fields in top condition. Some of the tips I offer relate to system design. If the right product isn't specified for the right application, or at the manufacturer's recommended spacing and pressure, the system may use too much water. Other tips involve regularly evaluating system performance and then making any necessary changes to improve performance moving forward.

DESIGN TIPS

• Use a variable frequency drive (VFD) pump. VFD pumps adjust pump motor speed based on the demand of the irrigation zones that are running. Not only can this save water, but will also save on electricity.

• Pay strict attention to zoning the irrigation system (how the system is sectioned or divided) for these reasons:

• Fields with specific areas that incur heavier use should be zoned accordingly. For example, the centers of football, soccer or lacrosse fields typically endure more wear and tear. When it's time to re-seed or re-sod these areas, having them on a separate zone allows you to water them as needed and eliminates unnecessary watering of the perimeter.

• Sunny and shady areas should be zoned separately so you can apply more or less water to each respective area. If there are sunny areas combined with shady areas in the same zone, many sports turf managers will water according to the needs of the sunny areas, which then results in overwatering the shaded ones.

• Low-lying areas should also be zoned separately to minimize or eliminate run-off that can create boggy conditions in those areas.

Large area sprinklers as water conservation devices

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QUITE OFTEN people will see large expanses of turf in parks and on athletic fields, and think of how wasteful they are in regard to water. That perception is increased when they see the irrigation system running, and spraying large amounts of water into the air. What they don't understand is that those lush, green turf areas are more than just important recreational sites, they are air purifiers, contaminant filters, oxygen producers, air conditioners, and carbon sinks. They also provide us with pleasing green space, so important to human happiness, and help to offset the effects of hardscapes and buildings in our urban environment.

What about the water they use? Yes, water is needed to keep these surfaces in top shape, but the water used is for a good cause, as evidenced by the paragraph above. Everyone agrees that we need to clean our air, sequester carbon, offset the heat we create when we develop land, and provide safe play surfaces, and sports turf does all these things extremely well. The perception of some is their reality, and that is water is being wasted. But is it true? Professionally managed, well-maintained sports turf, watered by a professionally designed, installed, and maintained irrigation system actually uses water very efficiently, and that is what we will explore here.

Perception: Large rotors spraying great amounts of water are inefficient.

Fact: Manufacturers of sports turf sprinklers spend huge amounts of engineering, testing, and development time, and money to produce emission devices that rate in the excellent category as far as irrigation efficiency, as defined by the Irrigation Association. A properly designed and installed irrigation system operating at the appropriate pressure distributes water with a high degree of **uniformity**, ensuring the system only needs to run for the optimum amount of time to provide adequate water. Inefficient sprinklers that do a poor job of applying water must run for extended time to make sure the driest area receives enough water to keep it green, while wetter areas are overwatered—sometimes by more than twice what they need. Concerning the large amounts of water coming out of the sprinkler, just remember, they are covering a greater amount of area when compared to spray sprinklers as well.

Perception: Large rotors operate for long periods of time compared to spray sprinklers, and that wastes water.

Fact: Large rotors do run for much longer times than typical spray sprinklers, and they need to. Small area spray sprinklers apply water at a high application rate, generally around 1.5 inches per hour. Some are much higher than that as well, but just imagine a rain storm that measured 1.5 inches in one hour; that's a lot of rain, at a rapid pace. Spray sprinklers by their nature apply a lot of water quickly, and only need to run for a short time to get the job done. Large rotors by comparison apply water at very slow rates, normally in the range of .5 inches per hour, one third the rate of sprays. They do need to run three times longer than spray sprinklers to apply the same amount of water to an area, but they do it with greater efficiency. Not only is their distribution of water superior to spray sprinklers, but the lower application rate ensures more of the water is absorbed by the soil, and is available for the plants. Soils in general cannot accept water at high rates, so some of the water applied by spray sprinklers may not reach its intended destination—the rootzone.

Irrigated turf for sports fields serves a variety of good purposes, and the supplemental irrigation of these spaces helps contribute to these benefits. Irrigation efficiency is the key to the responsible use of our water resources, and large area rotors are important tools in the professional manager's arsenal. ■

• Design using head-to-head coverage. Head-to-head coverage (overlapping the spray from a sprinkler head with the spray from the sprinkler head next to it) maximizes irrigation efficiency. The higher the efficiency, the less time it's required to run the irrigation system to produce the desired results.

• Use sprinklers with the same precipitation rates within each zone. "Precipitation rate" refers to the amount of water sprays or rotors discharge in inches per hour. Always have sprinklers with the same precipitation rates running together on the same zones for an even application of water over the entire zone. When sprinklers with different precipitation rates are combined on the same zone, some areas of the zone will be overwatered and others will be too dry.

OTHER KEYS TO EFFICIENCY

• Regulate water pressure. High water pressure causes water to emit from sprays and rotors as fog or mist, often evaporating or drifting away in the wind and leading to longer run times. Every additional 5 pounds of water pressure (5 psi) over the sprinkler's optimum operating pressure causes each head to use 6-8 percent more water—an amount that can really add up over time. Pressure-regulating valves and swing joints can remedy this situation, as well as sprays and rotors with in-stem pressure regulation.

• Check nozzle efficiency. Distribution uniformity, or "DU," is the industry measurement of nozzle efficiency shown as a percentage or decimal. The higher your system's distribution uniformity, the less time it will have to run to achieve the desired results. You can determine your DU by conducting an irrigation audit on your own using a catch-can method, or you can have a third party perform the audit, such as the Center for Irrigation Technology or your sprinkler manufacturer.

• Schedule wisely. Evapotranspiration, or "ET," measures the rate that plants lose water through evaporation and transpiration. ET is calculated based on temperature, humidity, solar radiation, wind speed and rainfall. ET rates are typically lowest early in the morning, so water applied during that time is less likely to evaporate due to solar radiation. Wind speeds also tend to be lower in the early morning hours than at other times of the day, making it more likely for your irrigation water to land where it should and further improving system efficiency.

• Consider ET-based control. Using an ET-based control system can reduce irrigation frequency by as much as 30-50%. These systems gather local weather data to calculate a daily ET rate. This information then determines whether the system should run on any given day or whether zone/station run times should be adjusted. Even if your current controller is not ET-based, it's a relatively simple upgrade that can save a tremendous amount of water over time. ■