IRRIGATION & DRAINAGE

Jips to conserve irrigation

By Heather Kraus

ater conservation through efficient irrigation is not just an environmentally sound practice, it can actually provide greener turf. The goal of any irrigation system should be one that uses just the right amount of water to achieve uniform green grass results. To achieve this goal, turf managers need to know the basics of good irrigation design, installation, and maintenance for their sports fields as these factors can mean the difference between a water-wasting system and one that uses just the right amount. By making sure the basics are in place, you are on your way to a field that is not only adequately irrigated, it's also conserving water.

The principles of good design dictate that

turf receives uniform water coverage across the field. Uniform coverage is achieved through a combination of system design and product selection.

Spacing

Be sure that your rotors are spaced to achieve "head-to-head" coverage or more. Head-to-head coverage is when the distance of throw of one rotor reaches the next rotor. If you will be irrigating at a particularly windy time of day or your area receives persistent wind, consider reducing the head-to-head spacing by 15 to 20 percent.

When heads are spaced further apart than the distance of throw it is called "stretched spacing." Stretched spacing can cause you to have dry spots and then to over-water in pursuit of making those spots green. Getting the head spacing right is a critical component of creating a uniform application of water.

Be sure that you are achieving matched precipitation, which is the uniform application of water across the irrigated area. Matched precipitation can be achieved in several ways. The first and most effective way to match precipitation is to zone/valve your quarter, half and full head patterns separately. If your heads are spaced evenly, you will choose the nozzle that performs for the given distance of throw. You will run your half patterns twice as long as your quarter patterns and your full patterns four times as long as the quarter patterns. In this instance, you would run your quarter

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zones for 10 minutes, your half pattern zones for 20 minutes and your full pattern zones for 40 minutes. Zoning your head patterns together prevents them from running for the same amount of time. If you were to run all your rotors for the same amount of time, you would apply four times as much water on your quarter pattern turf area than your full pattern turf. This would be an egregious waste of water!

If you do not have the benefit of separately zoned rotors, nozzle selection is your next best solution. Manufacturers provide performance charts that are readily available through the catalog, a distributor or online. While you won't be able to achieve true matched precipitation when using different nozzle sizes, you can approximate it by choosing a nozzle for a quarter pattern that has half the flow of the half pattern it is zoned with. Some manufacturers sell matched precipitation rate nozzles that are easy to use across several radius and arc patterns.

Pressure

Pressure is often overlooked as a water conservation tool. However, in order to get matched precipitation, head pressure should be constant or at least not vary too widely between heads. Proper pipe sizing is a key to reducing pressure loss due to friction between the heads and zones. Too much pressure and the spray of the rotor will atomize and the water will evaporate or blow away. Too little pressure and you will also have poor nozzle performance. Unbalanced pressure will lead to mismatched precipitation between rotors on the same zone. Manufacturers' charts indicate the appropriate pressure for the rotor and nozzle. The optimum pressure is generally in the middle of the performance range for the rotor.

Depending on what activities take place on the field, the field most likely sees more use at its center. In that case, you may want to consider

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zoning your heads in the center of the field on a separate valve. This way you have more control and flexibility over center field irrigation.

Slope of field

Because many field designs incorporate a crest or crown in the field, consider placing your heads along the crown or spacing them so that there is even coverage of the crown. Anticipate which way and how quickly your field might generate runoff; this may affect your spacing or run times. Consider your soil type as you design for this situation.

Product selection is an important component to the design but can also help if you are trying to retrofit a poorly performing field irrigation system. Products turf managers can use to improve irrigation efficiency include self-adjusting controllers, heads with even distribution performance, and rain and soil moisture sensors. Some manufacturers also offer damage-resistant heads. These models offer non-strippable gear drives and a feature that returns the rotor arc pattern to its pre-set pattern if its arc setting is twisted, eliminating wasted water from a head that is out of adjustment. In addition, pressure-regulating products, such as pressure regulating swing joints or pressure regulating dials on the valve, can even out pressure for more uniform results.

Maintenance and troubleshooting

All systems require proper maintenance. While there are many paths you can take to optimize the performance of your field, the first thing to consider is an irrigation audit. From the audit results, you can determine the overall performance of your system, which may help you decide your next steps. An audit may show you performance issues that are not easily spotted by simple observation. Small fixes like straightening heads or replacing nozzles can make a big difference in how well your turf is irrigated.

For older systems, turf managers should consider re-evaluating their systems' performances since significant development changes in the area may have occurred since the irrigation system was installed that would affect water pressure. Turf managers should validate their water pressure to ensure it's not too low or too high. Be sure to measure pressure at the time you normally run your system as water system pressure can fluctuate depending on the demands at specific times of day in your area. If you have stretched head spacing, you may need to adjust the location of some of your heads accordingly to optimize irrigation coverage.

In addition, check controller zone run times to ensure your controller is running the zones for the appropriate length of time and don't hesitate to replace a product if it's not performing properly.

By sticking to the basics of good design, product selection and maintenance, sports turf managers will not only conserve precious water resources, they'll be rewarded with greener, healthier turf. ■

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