Sprinkler systems for non-field applications

Editor's note: *Jim Laiche, business development manager for Toro Irrigation, answered a few questions on upgrading or installing new sprinkler systems.*

SportsTurf: Say I'm a turf manager responsible for improving the irrigation system for landscaped areas at a campus, in a park or around sports facilities. How should I evaluate what I have and find out what I need?

Laiche: This is a broad based question, but in most cases evaluating and possibly upgrading both the delivery method (sprinkler heads and nozzles) and the control system will provide the best results. Most people believe simply upgrading a control system will make their plant material look better while using less water. It does, if you are already running a well-designed and maintained in-ground irrigation system.

Things to look for in the field:

• Head to head coverage from sprinkler heads (one sprinkler head throwing water to the next)

• Adequate water pressure at the sprinkler heads; too high makes the sprinkler heads mist while too low creates dry areas around sprinkler heads (doughnuts)

• Properly adjusted sprinkler heads, coverage area is correct

• Areas with low head drainage

• Zone audit. This measures the DU (distribution uniformity) of sprinkler heads in an area. It essentially is a measurement of the lightest watered areas to the heaviest. Many irrigation professionals provide this as a service.

• Measurement of PR (precipitation rate). This indicates how fast sprinkler heads apply water to an area in Inches per hour. This information is necessary if converting to an ET or weather-based control system.

Once you have the field sprinklers analyzed and perhaps modified, then you look at the control system. Most irrigation managers can only modify their irrigation controller programs a few times per year. With a central control system they essentially change daily with changing weather conditions. Most systems tie directly into an onsite weather station or an internet-based ET (evapotranspiration). This value is used to adjust sprinkler runtimes up or down depending on local conditions. Hundreds of controllers are shutdown automatically for rain and other site conditions.

Things to identify on your control system:

• How often can you make changes to the programs?

• How long does it take to shut down for a rain event, do all controllers shut down?

• Do runtimes meet both the local weather conditions for time of year and the soil infiltration rates?

• Is the system running at times it should not?

• Can I manage a large water source that supplies irrigation to multiple controllers?

• Do I have hand-held control on every controller?

• Do you need water use records from irrigation?

• Do you often have breaks in the system that go undetected?

ST: How do you determine costs of putting in sprinkler system vs. using a system that involves manpower and moving hoses around?

Laiche: With manual irrigation you have to consider the hourly cost of labor, transportation expense and wasted water. This can add up quickly and results in very inefficient irrigation practices. Compared to manual irrigation, you can save 30 to 40% of your water cost and 90% of your labor by automating the irrigation.

ST: What's the newest in water-saving technology in this product category?

Laiche: High efficiency spray nozzles improve uniformity while reducing water by up to 30%. Rotating spray nozzles distribute water up to 26 feet from a spray head body. Weather-based stand-alone controllers adjust the runtime based on both local and historical temperatures and solar radiation.

Central control systems run large groups of controllers from a single location. You can adjust with local weather station, plus monitor and record flow. Soil moisture sensing reads soil moisture, temperature and salinity and reports back to a computer. Adjustments can be made to the irrigation system based on real-time soil conditions. ■

Using smart water technologies

Editor's note: *Troy Leezy, marketing manager for Hunter Industries, and a certified irrigation designer, water auditor and water conservation manager, wrote this update*

WITH INCREASING FOCUS on water conservation and efficient irrigation practices come new opportunities. Whether it is a product upgrade or replacing an aging irrigation system, a wide variety of efficient product solutions exist in the

market today. Many of the new products available today do not require much or any effort above and beyond traditional installation practices and offer a reasonable timeframe for return on investment.

While exploring any upgrade solutions, strong consideration should be paid to getting site pressure as close to optimum as possible for the sprinkler types to be used. Pressure is as important as proper spacing to achieve the greatest possible efficiency in any system. High pressure is as much an enemy to efficiency as low pressure and should be a priority regarding initial design or existing system evaluations. There are a wide variety of solutions on the market today to address high pressure. Pressure can be easily adjusted at the valve with an add-on regulator that allows the installer to select the ideal pressure the sprinkler requires. Additionally, many manufacturers offer pop-up spray sprinklers with built-in pressure regulators pre-set to optimum nozzle requirements or a simple add on pressure regulator at the valve can be an easy solution.

The simplest form of water conservation upgrade can be a wireless rain sensor, which saves an average 10% of water use. On the high end of control upgrades are "smart" irrigation controllers that adjust irrigation schedules on a daily basis depending on weather conditions. Studies have shown smart controllers can save up to 30% of water use depending on prior management practices. New products are arriving on the market that are more cost effective and user friendly, making smart controllers an easier sell, especially on residential projects.

Replacing existing spray nozzles with rotary nozzles, such as MP Rotators, or incorporating them into a new system design provides greater water savings and drastically increased efficiency. In many cases, rotary nozzles can be successful in improving poorly performing spray systems due to low pressure. Because rotary nozzles require less water to operate, they have the advantage of reducing friction losses in an existing system and improving the operating pressure at the head. Additionally, due to lower water requirements of the nozzles, more area can be irrigated with fewer zones, reducing system costs with fewer valves, smaller controller sizes, less pipe, wire, fittings, and labor.

Drip tubing with pre-installed, in-line emitters offers substantial advantages over traditional irrigation methods in not only water savings, but also time and cost considerations. In many cases the tubing can be simply "snaked" through planters and then mulched over. Winterization can be a snap by incorporating threaded caps on line ends that can be removed for blow out.

On any projects with elevation changes, check valves should be installed, at the very minimum, on the lowest heads. One hundred feet of 1-inch pipe on single zone can waste 4 gallons of water per zone cycle through low-head drainage. On a 12-zone system, that equates to 48 gallons per irrigation day. Beyond saving water, check valves will also protect the sprinkler from the water hammer that occurs every time the valve turns on and water rushes to fill the empty lateral line, greatly increasing sprinkler longevity.

One last note when working on improvement of older existing systems: sprinklers should be reset to proper grade level, screens cleaned, and nozzles replaced. Nozzles on both spray heads and rotors will wear over time and lower the ability for water to be sprayed efficiently. It is a good idea to check with your local irrigation distributor to see if there are newer, more efficient nozzles available for existing, installed sprinklers. ■

Choosing the right high-efficiency nozzle for turf applications

SPECIFYING, designing or upgrading an irrigation system can be a time-consuming process filled with many important decisions. The decisions made about even the smallest and deceivingly simple components, like spray nozzles, can have a major effect on a system's performance and the landscape's appearance.

Nozzles are responsible for dispersing water to the landscape in different amounts and at varying distances of throw. The ideal nozzle for a particular application will deliver the right amount of water to the area of the landscape for which it's intended in an acceptable amount of time. A less-than-ideal nozzle may apply water unevenly, leaving some areas too dry and others too wet. Other nozzles may apply water too slowly, a problem for sites with short watering windows.

Choosing the right nozzle can also reduce water consumption. The wrong nozzle may apply water too quickly, creating run-off that flows into the gutter rather than soaking into the soil. Or, at sites with high water pressure, it may create a mist that simply blows away in the wind instead of landing on the turf.

Because of the significant impact that nozzles have on irrigation system efficiency, choosing the best nozzle for an application is crucial. However, it's one of the most commonly overlooked elements of irrigation system design.

TYPES OF NOZZLES

Spray nozzles typically fall into one of three basic categories: fixed arc, rotary and variable arc. Today, irrigation system manufacturers are developing new high-efficiency versions of these nozzles with advanced features that overcome challenges like wind, compacted soil, high water pressure and elevation changes. They're designed to provide greater distribution uniformity and a lower scheduling coefficient than the nozzles of the past.

Fixed arc nozzles are available in a variety of models based upon throw distance (the maximum distance the nozzle can cover with water) and a fixed arc pattern. Most fixed arc nozzles come with arc patterns ranging from a maximum full-circle to the minimum one-third circle. Throw distances range from eight to 15 feet.

Rotary nozzles emit rotating streams of water rather than a constant spray. Because their throw distances range from 13 to 24 feet, they're intended to cover larger areas than other fixed arc nozzles. Their greater throw distance makes it possible to use fewer nozzles to cover the same area. Like all fixed arc nozzles, rotary nozzles also come in fixed arc patterns of 45 degrees (one-third circle) to 360 degrees (full circle). These unique nozzles also feature a low precipitation rate and highly uniform distribution.

Rotary nozzles are often good choices for sloped areas and landscapes with compacted soil. Because of their low precipitation rate, (e.g., 0.6 inches per hour for Rain Bird rotary nozzles); these nozzles apply water slowly so that it can soak in rather cause run-off and erosion.

Variable arc nozzles (VANs) are also available in various throw distances, but their arcs are adjustable from 0 to 360 degrees. As a result, VANs give landscape architects the freedom to design landscapes of almost any shape and size. Furthermore, because VANs can be adjusted to any angle, contractors can keep fewer nozzles on hand and specifiers can specify a single nozzle in multiple scenarios.

With all of the high-efficiency nozzles available today, choosing the right one can seem overwhelming. The best way to approach the process is by answering a series of questions about a site's particular needs and its inherent characteristics:

- How large is the area, or zone, to be watered?
- What is the zone's shape?
- What's the degree of slope?
- What soil type is present?
- Is the area frequently subject to high winds?
- How much water pressure is available?
- Is there a limited watering window?

A landscape's overall health and water efficiency depends greatly on the type of spray head, rotor or nozzle that you choose. By taking the time to carefully analyze your landscape and the various product choices available, you can design a system that provides efficient irrigation for years to come. ■

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Sprinkler head converter

As part of Kochek's Water Movement line, this product converts a sprinkler head from any manufacturer into an instant hose adapter or quick coupler. The PVC braided hose rotates 360˚ supporting movement in any direction. The hoses are made of stainless steel reinforced clear poly braid. Designed to be used with Kochek products for hand watering localized dry spots, equipment washing, or any hose application where only a sprinkler head exists. This adapts the sprinkler head to create the hose connection you need. Comes with 1-in. Full Time Swivel aluminum connection. Available in 4 sizes Toro 730/830, Toro 750/850, Rain Bird 700 Series, and Rain Bird 900 Series.

Kochek

Kifco Water-Reel

The Kifco® T180 Water-Reel® can irrigate a football field in an un-attended single pass and automatically shut down upon completion. It requires no in-field plumbing to install, maintain, winterize, cause injury or affect play. Typically the T180 is set-up and started after evening activities, runs unattended through the cooler evening hours and easily put away in the morning. The traveling irrigation pattern is more uniform than a solid set pattern and evening operation improves efficiencies. It is compact, simple, reliable and very portable and can be used on multiple fields or locations. The reel mounted booster pump option allows successful operation even with low water pressure.

High-tech sprinkler control

The Vision House features a high tech sprinkler control system that monitors weather conditions daily and then automatically resets each sprinkler zone so that the correct amount of water is applied to lawns, trees and flower beds as needed. "SmartLine adjusts the system 365 times a year and takes the guesswork out of landscape irrigation scheduling," says Brodie Bruner, VP for sales and marketing at Weathermatic. SmartLine promotes water conservation by preventing runoff and erosion and completely turns off the system during rain or a freeze. Additionally, it meets new water conservation standards mandated in many communities today. SmartLine features two components: the SLW Series On-Site Weather Station and the SL1600 Modular Controller. The SLW monitors the weather, including high/low ambient air temperature and rain or freeze conditions, and is mounted to a fence.

Weathermatic