MAXIMIZING WATER USE ON ATHLETIC FIELDS

BY **LUKE FRANK**

There are numerous approaches to effective turfgrass cultivation. The use of nutrients, surfactants, soil amendments, and other elements can certainly improve turf health, as can verticutting, regular aerification and other cultural regimens. But when you get right down to it, for most facilities optimizing irrigation system performance and scheduling regimens are going to yield the greatest results.

Irrigation management is vital to the success of any turf management program. There are at minimum three courses of action to take for effective, responsible irrigation management:

- A thorough irrigation system inspection should be performed to evaluate component performance and overall irrigation efficiency, and determine precipitation rates;
- regular scheduling adjustments must be effected according to historical and real-time weather condition; and
- regular irrigation system inspection and maintenance routines must be in place.

The exception is a turf manager who routinely and fastidiously inspects an irrigation system. The rule seems to be responding to damage or a larger crisis, and then cursing the irrigation system for failing.

Take the time to create an irrigation system inspection program and tracking spreadsheet to identify and repair malfunctioning irrigation equipment before it becomes a problem. During the busy season, an irrigation specialist on your crew should be monitoring irrigation functions daily. This technician should continually inspect the entire system as follows: Meters and pumping operations should be inspected daily. Perimeter heads and valve boxes twice weekly. Internal heads and valve boxes weekly. Turf quality every time you're on the site.

Head check

When inspecting sprinklers, use the following guidelines:

- Check the height of each head ensuring discharge is clearing the turf. Be sure the head is level.
- Check the coverage of full- and part-circle heads to ensure the sprinkler is covering the area of its intent and turning completely. Also measure the radius of throw and compare to manufacturer's specs.
- Check the sprinkler housing for damage and remove any sand, grass or other debris.
- Check the nozzle disbursement of each head. Note the nozzle pattern and look for obstructed orifices. Twice yearly, check the nozzle size using a drill bit to compare to the original size.
- Use a Pitot Tube to check nozzle pressure at discharge, and log the data for future reference and comparisons.
- Check for weeping electric valves, which usually indicate debris that should be removed.
- Check any low heads for drainage, which might indicate a valve is weeping or a need for check valves.
- Log all work and keep records of sprinkler model, nozzle size, pressure at head, radius of coverage, and speed of revolution.

Valve check

Use the following guidelines when inspecting valves:

- Check access to all valve boxes.
- Check all wire connections.
- Check to ensure electric valves close and open, both electrically and manually. If a single valve doesn't open, check the solenoid, wiring or tubes. If the problem is electrical, it can be either the common or hot wire. If several zones are

down, check the controller for both input and output power. If the power is good, check the area to the first zone for damage to the hot or common wires. Target areas of recent work.

• Check all gate and ball valves to ensure they open and close, and that all are clear of debris and accessible. Leaking around the top of a manual valve indicates that the packing nut needs tightening. Leaking through the valve indicates either debris lies between the disc and seat, or that the disc is damaged.

•Check the pressure setting on all pressure-regulating valves against logged data to ensure proper settings. A difference of five to 10 pounds can seriously affect intended precipitation rates.

Controller check

Use the following guidelines when inspecting controllers:

• Check connections.

• Check grounding and test once yearly.

• Check irrigation schedules, and test manual operations of the zones that you checked that day.

• Test for continuity, and voltage input and output from the controller.

• Check for and remove debris.

• Test any rain, moisture or shut-off devices.

• Have wire-tracking tools on hand to locate weak or broken wires.

Pipe check

Use these guidelines when checking pipes:

• Traverse the pipe route looking for puddles, flowing water, wet spots, places where equipment suddenly scalped the turf and new lakes or ponds that may have developed overnight.

• With help, activate zones and listen for sounds of water hammer or other unusual pipe noises.

Building a responsive inventory

With your system inspections completed, use your spreadsheet to record system failures. Then you'll know which parts to keep in stock for quick repairs, and you may have identified a more serious problem for which to budget and repair or replace down the road.

Spare irrigation parts should be inventoried and maintained to handle the most common failures, so parts needed for any repairs are on hand. Ensure that the spare parts are of the same make and model as those on the site. Product integrity absolutely plays a role in irrigation efficiency.

You've optimized the performance of your existing system (hopefully without too much investment) and you have your inspection and repair spreadsheet in place. Now it's time to refine your irrigation scheduling.

Developing accurate irrigation schedules requires first-hand knowledge of your system's strengths and weaknesses, and where the greatest management and equipment improvements can be made the quickest.

Catch-can tests (see "Q&A" p. XX) are excellent opportunities to assess your system's performance while determining each zone's precipitation rate. You have to know what at what rate and how evenly your system is applying water. At the very least, run a catch-can test per zone to determine the lower quarter distribution uniformity. This will enable you to schedule to the driest spot in the zone.

Using ET data

ET (Evapotranspiration) data, real-time or historic, should be the cornerstone of your irrigation scheduling. On-site weather stations are not the only source for ET data. Most sprinkler manufacturers or university extension agents can likely provide monthly reference or historical ET for your area, from which you make, at minimum, simple water-budget adjustments monthly, based on historic weather inputs and precipitation rates.

Professional turf managers should have a monthly baseline irrigation schedule and be prepared to make daily or weekly adjustment according to real-time site conditions. Be ready to respond to wind, rain, heat, and humidity conditions on your turf site.

ET has certainly become more mainstream over the years in creating more accurate irrigation schedules, and there are volumes of manuals, guides and other literature that explain in great detail how data is collected and used.

All of these activities are intended to create a proactive turf management program that:

1. Prevents water waste or plant stress and the associated expenses.
2. Prevents disease and erosion that comes from overwatering.
3. Prevents system component wear-and-tear.
4. Prevents turf damage associated with pedestrian and vehicle traffic.
5. Reduces your water and power and manpower consumption. ST

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