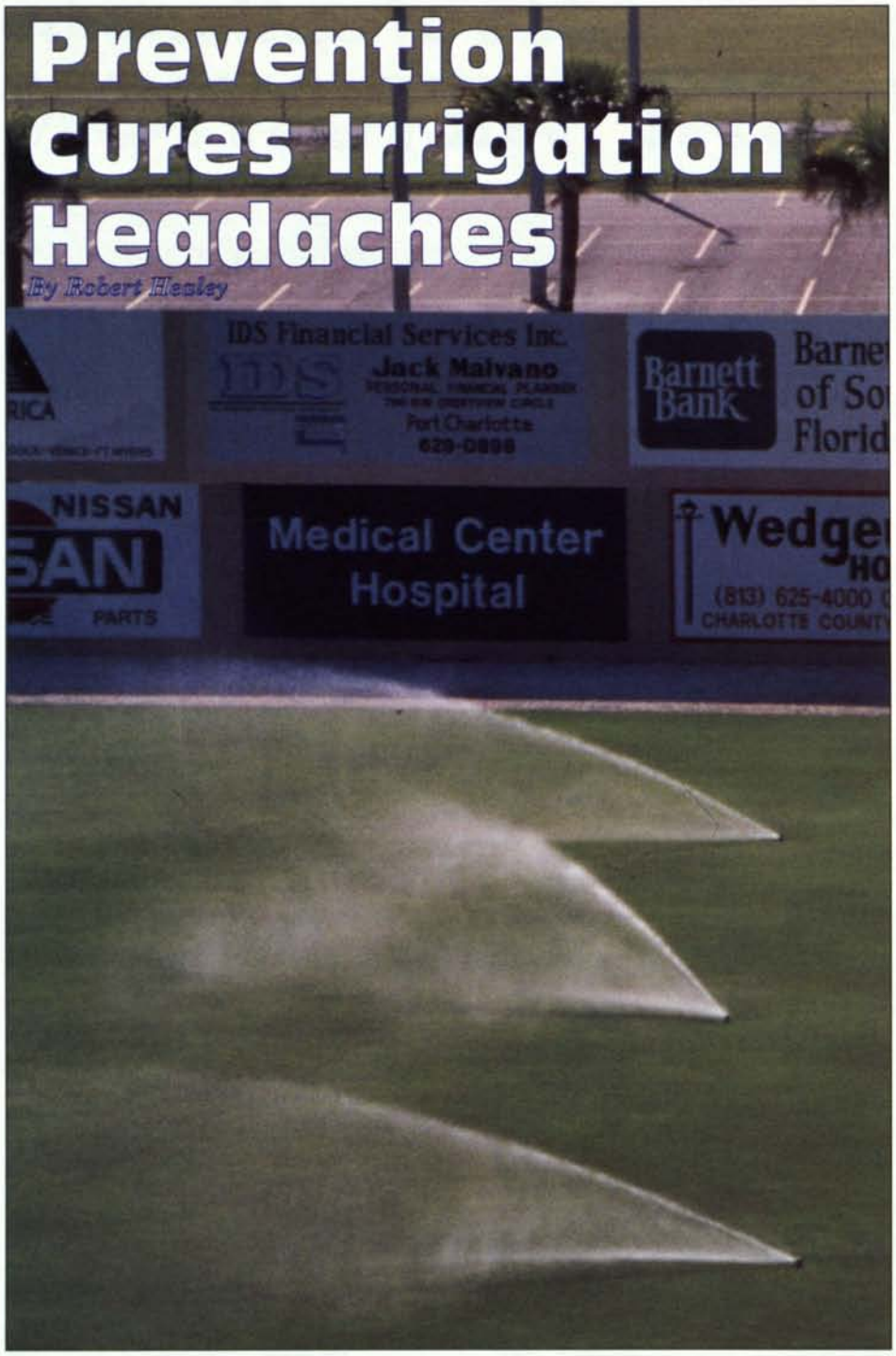
Prevention Cures Irrigation Headaches

By Robert Hesley



Your sports turf irrigation system should be treated like any other piece of equipment on site and given periodic inspection and maintenance to ensure proper operation. Often, the single most expensive tool sports turf managers have to control the growing cycle of turf ares their irrigation system. Yet they are often the most neglected.

Mowers receive tender loving care; washing after each use, daily oil checks, greasing, reels lapped, blades resharpened or replaced, and often yearly paint jobs. But irrigation systems into the ground until something breaks, then one hears of how bad the system is.

How long would your turf maintenance equipment run efficiently and effectively if all that you did was gas it up when needed? Would you be happy with the resulting cut or performance that these "non-maintained" mowers give, or their durability? Yet, this is how irrigation systems are often treated.

A primary incentive to committing to regular irrigation system maintenance is the dilemma of down time. When your mowers are down they can remain down for a day or two. There are always the options of adapting other mowers to cut specific turf areas, borrowing equipment from a neighboring course or supplier, or purchasing a new machine. Rarely will any permanent turf damage occur because of a crippled mower.

However, if your irrigation system is "down" for even one day, there is the prospect of irreversible turf damage. Too often, the value of an irrigation system is not appreciated until it goes down. Sports turf managers must be equipped and prepared to limit these down times and bring their irrigation systems back on-line quickly.

Preparing for Failure

By identifying common areas and causes of down time, the superintendent is better prepared to curtail or circumvent system failure.

For example, pumps can fail mechanically, or lose power under storm conditions.

I strongly recommend having an emergency backup PTO pump if your system employs a pump. You should consider a PTO pump that will connect your tractor to your pump house, enabling you to bypass the down pumping system and, at a minimum, get water to areas that need it.

Another suggestion is to modify your irrigation system's isolation valves to minimize the area of the turf hung out to dry in the event a mainline pipe breaks.

Spare irrigation parts should be inventoried and maintained to handle the most common failures, so parts needed for any repairs are on hand. These parts include all sizes of piping and repair couplings, isolation valves, electric valves, quick-coupling valves, swing joints, fittings, concrete for thrust blocks, a spare satellite, a wire tracer, wire, wire connectors, a volt meter and other necessary parts unique to your system.

Finally, organize an irrigation inspection program. Learn to identify and repair malfunctioning irrigation equipment before it becomes a problem. During the busy season, an irrigation specialist should be monitoring irrigation functions daily. This technician should continually inspect the entire system as follows.

Checking Sprinklers

When inspecting sprinklers, use the following guidelines:

A—Check the coverage of full- or

part-circle heads. Be sure the sprinkler is covering the area of its intent. Measure radius of throw and be sure the head is turning completely. Ensure no surrounding plant material is blocking coverage, and trim these plants as needed.

B—Check disbursement at the nozzle or nozzles of each head. Note the nozzle pattern and look for clogging or clogged orifices. Minor problems can usually be handled in a few minutes by removing the nozzle, then cleaning and flushing the head and riser.

C—Use a Pitot Tube to check the discharge pressure of the nozzles and log the data for future reference and comparisons. If several heads in-line or in a group become weak or inoperative, a rock or other debris may have entered the line clogging a valve; or the piping may have sprung a leak. Follow your pipe layout plan, this helps to locate the probable area of trouble.

D—Check the sprinkler housing, particularly impact heads, and remove any sand, grass or other debris. Also look for damage.

E—Check the height of each head ensuring discharge is clearing the turf. Check the level of the turf and look for scalping around each head. Be sure the head is level.

F—Twice yearly, check the nozzle size using a drill bit to compare to the original size. Even brass nozzles will eventually erode and enlarge, thus changing flow rates, precipitation rates and coverage.

G—Check for weeping at all valve-in-heads and electric valves. Weeping usually indicates the presence of debris that should be removed. If this doesn't work, visually check the tubes or diaphragm and clean, blow out or replace as needed.

H—Check low heads for drainage. Drainage may indicate a valve is weeping or you may need check valves.

I—Check your satellite zones; review scheduling; look at the connections at the controller box and check for animal damage or insect larvae.

J—Log all work and keep records of nozzle sizes, pressure at head, radius of coverage and speed of revolutions (this is especially important for two-speed heads). Major changes in the time for one complete turn can indicate developing problems in the sprinkler.

Comparing these logged records can show the beginning of pressure and

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radius loss, and identify many other developing situations before they become serious problems. Good records can often identify trouble before a visual inspection can.

Checking Valves

When inspecting valves, use the following guidelines:

A—Check access to all valve boxes, where applicable.

B—Check flow controls.

C—Check all wire connections.

D—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. Check your plan for wire or tube route from the satellite, and track to locate a break or weak link (look at recent areas of construction or work). If the problem is electrical, it can be either the common or hot wire. Testing for continuity can help isolate the problem. If several zones are down, check the satellite 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. Again, target the areas of recent work.

E—Check all gate and ball valves to ensure they open and close, and 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 that debri lies between the disc and seat, or the disc is damaged. Applying more pressure does no good. Open and close the valve several times to try and flush the blockage. If the valve is still leaking, open it, inspect the seat or disc, and repair or replace if needed.

F—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.

Checking Field Satellites

When inspecting field satellites use the following guidelines:

A—Check connections.

B—Check grounding and test once or twice yearly.

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

D—Test for continuity, and voltage input and output from the satellite.

E—Check and remove larvae.

F—Test any rain, moisture or shut-off devices.

G—In northern climates, consider removing the satellites for storage during winter.

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

Checking Pipes

Use these guidelines:

A—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.

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

Like any other piece of equipment, an irrigation system needs a scheduled preventive maintenance program for optimum operation. Proper use of your system, and proper procedures in daily maintenance inspections help keep the system running at peak efficiency. The time spent in a complete irrigation inspection, maintenance and preventive maintenance program will help ensure limited down times.

Again, your irrigation system is likely your most expensive and complex tool; treat it as such. With respect and care, you will be the benefactor over the years, and other sports turf managers will wish that they had a system like yours—one that never breaks down. ❑

Editor's note: Robert Healey ASIC-CID is an irrigation consultant and owner of Irrigation Management Services in Natick, MA.

Coliseum System Survives Quake

Damages are still being assessed at the Los Angeles Memorial, home of the Los Angeles Raiders and the University of Southern California Trojans, after the January 17 earthquake that caused widespread damage in Los Angeles and Ventura counties.

Despite damage to the upper portion of the Coliseum structure, officials at the facility were relieved that the first phase of a $15 million renovation project completed last May, which included a new irrigation system survived the quake with minimal or no damage.

"The sprinkler system itself held up well," said Clayton Peet, director of operations for the Coliseum. "Once we repaired the mainlines, it worked fine."

Flexibility throughout the irrigation configuration was the key to preventing damage. Plastic pipes were installed during the renovation last spring, and all the new sprinklers were equipped with swing joints. This combination reduced rigidity in the system and kept the equipment from cracking or splitting during the earthquake.

The plastic feeder lines to the controller, which sits atop a concrete pad, were intentionally given two to three extra inches to reduce rigidity. During January's vertical-motion earthquake, in which the ground moved up and down rather than rolling side-to-side, the loose lines stayed connected to the controller even though it is highly unlikely the controller moved in exactly the same ways as the field.

Jerry Nielsen, assistant general manager of the Coliseum, believes compaction of the irrigation piping with the sand under the playing field may have been another factor in the preventing damage to the system. "The compaction occurred purposely during installation so the growing medium would produce a firm, playable field," he said. "That probably helped in keeping the system in place."

The extent of the damage to rest of the Coliseum is still being studied by structural engineers. During the first week of February, the Federal Emergency Management Agency appropriated $10.9 million to the Los Angeles City Council for rehabilitation of the facility.

Until the Coliseum can be repaired and re-opened for public use, grounds crews will continue normal maintenance of the field. "We're in our winter mode right now, and we are certainly taking care of the field so we can be prepared to have an event whenever we're allowed," said Peet. ❑