Putting Irrigation Systems to Bed for the Winter

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As temperatures drop toward freezing in many areas, it is time to get irrigation systems ready for their "winter sleep." Systems must be completely drained and shut down to prevent damage caused by freezing water on the system components. Similar procedures are followed for new installations and for repairs that require system drainage.

Getting Started

Use a two- or three-person team to winterize an irrigation system. One person must constantly watch the system to ensure that all heads spray air during the blowing out procedure.

Always keep safety in mind. To prevent injuries, keep all personnel from standing directly over any commercial or large turf sprinkler as it is activated. Never attempt to disassemble the system while it is under pressure.

Serious damage can occur to system components if improper methods are used. The following general winterization steps apply to large park, athletic complex, and golf course irrigation systems. However, it is wise to review the instructions for *your own system* before tackling these procedures. For first-time winterization, check with an irrigation specialist on any particular concerns. Often, an irrigation specialist will provide a hands-on learning session.

Backflow Device Protection

The most sensitive part of the irrigation system is the backflow preventer. If this device is exposed to freezing weather conditions, it must be covered or drained before freezing temperatures arrive. When temperatures fluctuate, with a few cold days scattered among relatively mild ones, temporary covering of a backflow preventer with heat-keeping materials such as straw may keep it warm enough to protect it from freezing and cracking.

On many commercial installations, backflow preventers are kept within a heated building for year-round protection.

Any system in an area with freezing and below freezing temperatures during the winter is susceptible to damage from the cold. The most sensitive part of an irrigation system is the backflow preventer.

If the backflow preventer is in a building that is not heated, it must be monitored closely. When in doubt over the degree of protection to provide, *winterize*. It only takes a hairline crack to completely destroy a unit.

Step-By-Step

For complete winterization, first turn off the water by closing the main water supply valve.

If the system has automatic drains, use them to evacuate water. If the system does not have automatic drains, it must be "blown out" with compressed air from an air compressor. Keep the pressure regulator adjusted to 50 psi or less. Higher pressures could damage pipes and connections.

To achieve the volume of air necessary to blow out large systems, you may need to use two or three air compressors with 185 cubic feet per minute capacity. For large irrigation systems, a high-volume air compressor will be needed. *Excessive heat will be generated at the point of air connections to the system. To avoid damage to PVC piping systems, use a length of 1-1/2- or two-inch galvanized pipe to dissipate the compressor heat prior to entering the irrigation system piping.*

Air connection points made at the highest locations on main lines will permit water removal by air volume (CFM) as opposed to pressure (psi). Set the psi at the lowest possible pressure that will adequately remove water from the system.

Open drain valves and/or quick coupler valves at the far end of the system. When all water has been drained, leave the drain valves open and remove the quick coupler. Then, turn on one valve in the system, activating it manually from the controller. If it doesn't activate, more air is needed. The heads should operate just as they do when the system is watering. While the valve is turned on, the heads will begin to blow air instead of water. In this manner, evacuate water from one head or zone at a time, starting with the heads closest to the compressor. Electric valve-in-head and hydraulic normally-closed systems require a minimum air pressure of 35 psi at the head to activate the valve and may require additional time to open. When all of the heads blow air, turn off the valve and move to the next valve.

After the entire system has been cleared of water, repeat the process to ensure all water has been evacuated from the system. This eliminates any pockets where water may have settled during the first evacuation process.

Next, insert the key into the quick couplers and blow them out as well. Then take the air compressor off the system.

Remove the backflow preventer and take it inside to a warm spot, or open all the vents and all the ball valves so they are one-half open and one-half closed. The tolerance on the ball valves is so tight that it can trap water between the ball and valve assembly. Though the amount of water that collects during the running of the system may be extremely small, the tolerances are so close that a little bit of water will expand as it freezes and cause cracks.

Within the system, there will be a drain located just beyond the shut off valve. Ease the drain open after the system has been drained. If the shut-off valve malfunctioned, even a small trickle of water could refill the system over a period of time. This

accumulation of water could freeze, cracking the system, without the problem being noticed. If the drain is left open, any leak will be apparent.

Next, check the controller. Many controllers are equipped with head resistors designed to generate heat within the timing mechanism compartment. In most areas of the country, this head will prevent condensation and rust formation during winter shutdown. If this is the case, leave the AC power on at the controller and disable the timing mechanism by placing the switch in the manual position.

For controllers without heat resistors, it may be sufficient to simply turn them off, depending on the conditions where the unit is placed. Because no water passes through controllers, it is not necessary to protect them from freeze-thaw cycle, just from condensation. Check with an irrigation specialist to ensure proper procedures for "winterizing" your controller.

Hot Tips for the Cold

Don't try to rush the winterization process. The steps must be completed in the proper order.

1) Take precautions. Be on the lookout for the most common problems.

2) Make sure all quick couplers are completely blown out. Find all hidden couplers.

3) Leave the drains open. Leave the backflow devices one-half open.

4) Act early in the season. Taking care of a backflow device after the first unexpected freeze is too late. If a system can't be adequately prepared before the first freeze, another alternative is to run it. Moving water can take far lower temperatures without freezing.

5) Underground systems have more built-in natural protection than above ground systems. Because the ground retains heat much longer than the air, it takes an extended cold period for soil temperatures to drop to the danger level. Still, any system in an area with freezing and below freezing temperatures during the winter is susceptible to damage from the cold. Winterizing is your system's best defense. ♦

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Editor's note: Jeff Uleman is president of Uleman Enterprises, Inc., in Elkhorn, NE. He worked closely with National Sports Turf Managers Association board member Jesse Cuevas on the design and installation of the irrigation system for Rosenblatt Stadium on Omaha, NE.

The Cricket & The Ant

Did you know that there is a close connection between the air temperature and the tempo of a cricket's chirp? It is said that if you count the number of chirps in eight seconds and add four you will have the temperature to within a degree Celsius, nine times out of ten.

Ants are also very sensitive to temperature changes. The higher the temperature, the faster they move. One scientist claims that he can get the temperature of the air to within a degree by timing their speed. ♦

— Weather Facts and Fancies, R.A. Hornstein