Do It Yourself Sprinkler System Checkup Guide

Did You Know….

Watering lawns and landscape plants can account for up to 50% of an average homeowner's total water use. Watering a typical 5,000 square-foot yard with an in-ground sprinkler system could cost more than $10 per application

By properly creating and maintaining a water-efficient sprinkler system, you can reduce water usage while maintaining an attractive landscape.

Sprinkler System Evaluation

Normal wear and tear of your sprinkler system can lead to malfunctions and water waste. Efficient water use requires simple, but ongoing maintenance.

The first step is to perform a routine visual inspection of your sprinkler system. Frequency should depend on property usage. For instance, inspections should be performed more frequently on property heavily used by children or pets.

During the visual inspection, you should ensure that the system functions properly. Look for broken, missing or worn parts. Also check for any leaks and obstructed sprinkler heads. Be sure to properly fix any problems.

Once it is verified that the system is functioning properly, a simple catch-can test should be performed to check the evenness of water application. The catch-can uniformity test should be repeated any time the sprinkler system experiences changes, such as the addition of sprinklers, valve replacement or water source change.

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Watching for Signs….

Periodically inspect plants for the signs of overwatering or underwatering. Applying the right amount of water to your landscape can yield substantial water savings and better plant growth.

Signs of Overwatering

Prolonged periods of standing water can harm and possibly kill plants.

- Leaves may yellow, brown or drop prematurely.
- Individual branches may die back.
- Leaves turn yellow or light green.
- Leaves may droop, even when water is applied.
- Roots are wet, mushy, and dark brown to black.
- Soil around roots is moist to the touch, yet plant still droops.

Signs of Underwatering

Dry plants suffer stresses that cause damage to roots, leaves and stems.

- Leaves turn pale or light green.
- Leaves droop or wilt.
- Leaves may turn brown, starting on the edges.
- Stems have a wrinkled look and turn yellow or brown.
- Soil around roots feels dry.

Sprinkler System Terms to Know

Application rate: Also known as precipitation rate. The rate at which a sprinkler applies water, usually given in inches per hour (iph).

Check valve: A device installed to prevent drainage from sprinklers at lower elevations. Usually installed under the sprinkler, but some sprinklers have this device installed already.

Flow rate: The manufacture-designed water discharge rate from a sprinkler, measured in gallons per minute (gpm). A micro-irrigation emitter's flow rate is measured in gallons per hour (gph).

Flushing: A method of clearing dirt and debris from piping and sprinklers. To perform, remove the last sprinkler head in the zone, turn on the zone for a few minutes to flush, and reinstall the sprinkler.

Head-to-head coverage: Efficient sprinkler coverage that throws water over 80 percent or more of the distance to adjacent sprinkler heads.

Nozzle: The part of the sprinkler where water come out. Most nozzles can be interchanged to provide different flow rates or spray patterns.

Rain Sensor: Also known as a rain shut-off device or rain switch. A device that prevents the sprinkler system from turning on when there has been adequate rainfall. However, it does not interrupt the timekeeping function of a clock.

Rotary head: Also known as a rotor. This sprinkler type throws one stream or many streams of water while rotating, with many moving parts. Typically used to water large lawn areas, applying water at a slower rate than a spray head, from 0.1 to 0.3 inches per hour. Spacing in most residential systems is generally 25 to 35 feet.

Spacing: The distance between adjacent sprinkler heads.

Spray head: A stationary sprinkler head with no moving parts that pops up when water is supplied and down when it stops. Water is applied in a designated spray pattern at a rate from 1.0 to 1.5 inches per hour. Various nozzle types produce different spray patterns. Spacing is generally 3 to 15 feet.

Time clock: Also known as a controller or timer. An automatic timing device, connected to a series of electric valves, that turns sprinkler zones on and off according to a schedule set by a contractor or homeowner.

Valve: A device that controls the flow of water into a zone. Manual valves, such as a gate or ball valves, need to be opened and closed by hand. Electric valves are wired to a time clock.

Zone: A group of sprinklers that operate at the same time and are controlled by a single valve.

Solutions To Common Sprinkler Problems

Sprinkler being blocked by a plant or other object

- Keep the plant pruned back to prevent blockage. Check regularly.
- Add an extension or riser on the PVC piping under the sprinkler so it is above the obstruction. Although popular, this option is many times inefficient as it throws water higher into the air where it will be affected by evaporation and wind.
- Relocate the sprinkler out in front of the obstruction. If necessary, adjust or replace the nozzle so that all plants are watered.
- If in a plant bed, replace sprinklers with micro-irrigation devices that can be moved as plants grow. Micro-irrigation is not permitted on lawn grass.
- Determine whether the plants can survive without the sprinkler.

Sprinkler being blocked by lawn grass

- Replace sprinkler with a model that pops up higher.
- Add an extension between the PVC pipe and the sprinkler, ensuring that the top of the sprinkler remains just above soil level to avoid breakage when mowing.
- Clean out grass around the sprinkler and install a concrete “donut” around the sprinkler.

Water is squirting out around the sprinkler head

- Check sprinkler head, piping and fittings under the sprinkler for leaks.
- Check rubber or plastic seal inside the top of the sprinkler for debris and wear; replace with recommended seal if it is damaged or worn.
- Spray nozzles and rotor heads may need cleaning.
- Replacement of sprinkler may be needed.

Time clock is not operating

- Make sure it is plugged into a working outlet and switched to “on” or “automatic”.
- Make sure that the backup battery is not corroded or low on charge.
- Has it rained recently? Perhaps the rain sensor is interrupting clock operation. This is normal until the cork disc dries out.

Rotor sprinkler does not rotate correctly

- Check to ensure the sprinkler or the piping below it is not clogged. Clean sprinkler by soaking.
- Check if there is adequate pressure in the zone to operate this type of sprinkler. Another nozzle with a lower flow rate may need to be installed.
- The sprinkler may be broken. Replace it with the same type as others on the same zone.
- If the head is at the end of the main water supply line for your system, there may not be enough pressure to operate the sprinkler properly. The head should be capped, or a new zone should be installed. This may be a point where a licensed irrigation contractor should be contacted.

Spray head sprinkler not putting out any water

- Check to ensure the sprinkler, nozzle, filters or piping are not clogged. Clean parts by soaking.

Handy Sprinkler System Checklist

OBSERVATION	☑	SOLUTION
Sprinkler Selection & Layout		
Are lawn areas and landscape plants on separate zones?		If not, relocate sprinklers.
Are rotors and spray heads on separate zones?		If not, relocate sprinklers. Piping or other changes may be necessary.
Are lawn and plant areas that require watering receiving it?		If not, adjust spray pattern or replace with nozzle that has correct spray pattern.
Are pavement areas or plants that do **not** require water receiving it?		If so, replace or adjust nozzles to receive the appropriate arc pattern or relocate sprinklers.
Are spray patterns free from obstructions?		If not, trim plants or relocate sprinklers.
Are sprinklers covering at least 80 percent of the distance to adjacent sprinklers?		If not, relocate sprinklers to provide head-to-head coverage.
Are sprinklers of similar make and model used in each zone?		If not, match manufacturer and model within each zone.
Do all rotors or spray heads within a zone have the same flow rate?		If not, replace sprinklers or nozzles as needed to match.
Do sprinklers rise up enough to provide adequate coverage?		If not, replace short heads with taller ones of the same model or add fittings to raise height.
Time Clock Settings		
Are rotor zones set to run 45-60 minutes?		If not, adjust as needed.
Are spray zones set to run 15-20 minutes?		If not, adjust as needed.
Is the clock set to operate during allowable day(s) and times?		Know and follow local watering restrictions. Adjust as needed.
Rain Sensor Device		
Is the sensor blocked by plants or other objects?		If so, move sensor or prune plants.
Is the sensor wired into the clock properly?		If not, follow manufacture's wiring instructions.
Is the sensor checked annually for proper operation?		Check annually. See *Do It Yourself Rain Sensor Checkup*.
Maintenance Issues		
Are sprinklers or pipes damaged?		If so, repair or replace with similar model.
Are sprinklers clogged?		If so, clean nozzles, screens and filters by soaking and scrubbing with a toothbrush. If many are clogged, zone flushing may be necessary. Install filters or screens to minimize clogging.
Any leaks?		If so, check rubber seals for tears and debris. Clean or replace with similar model.
Are sprinklers leaning?		If so, place upright. Stake to protect if this occurs often, or consider moving the sprinkler. On slopes, heads should be aligned perpendicular to the slope.
Is water leaking from the lowest head when the zone is off?		If so, install a check valve or replace sprinkler with one containing a built-in check valve.
Landscape Appearance		
Do lawn and plants appear healthy?		Check for other causes of problems first (damage, fertilizer deficiency, etc.). If not, check plant's water needs against amount of water applied.
Are there excessively dry or wet spots?		If so, check sprinkler spacing and application rates.
Are there visible holes in the ground?		If so, check for leaks, fix, then fill holes.
Are there any areas that are visibly eroded?		If so, check for leaks, make repairs, fill area, and cover with mulch, sod or groundcover plants.

Does Your System Measure Up? Record Sheet For Catch-Can Test

Use this record sheet to conduct a simple catch-can test and find out how much water your sprinkler system applies. This will help you determine if you need to alter the system or make time clock adjustments to prevent over- or underwatering your landscape.

Supplies:

- Twenty (20) straight-sided containers of the same size
- Ruler
- Stopwatch, water or kitchen timer
- This record sheet
- A pen or pencil

Step1: Place the containers randomly underneath the spray pattern of one zone. You will need to repeat these steps in each zone.
Step 2: Turn on the sprinklers in that zone for 15 minutes.
Step 3: Turn off the sprinklers and measure the depth of the water you collected in each container.
Step 4: Record the amount of water (in inches) that you collected for each container.

1_____ 2_____ 3_____ 4_____ 5_____ 6_____ 7_____ 8_____ 9_____ 10_____
11_____ 12_____ 13_____ 14_____ 15_____ 16_____ 17_____ 18_____ 20_____

Total of All Containers in Inches _____

Step 5: Compare each container's water content to determine if the amount is the same between them. If any discrepancies exist, changes will need to be made to sprinklers or piping so that the water is applied uniformly in the zone. ***Alterations need to be finished prior to continuing.***

Some questions to ask yourself:

a. Are there areas receiving much more water than others? Much less water?
b. Do any sprinklers need to be added or changed so that water is applied evenly?
c. Are sprinklers throwing water over 80 percent or more of the distance to adjacent sprinkler heads?

Step 6: Add all container measurements together and divide by the number of containers to obtain the average depth of the containers in that zone.

_____ ÷ _____ = _____
Total of all containers ÷ number of containers used = zone's average water depth in inches

Step 7: Multiply the zone's average water depth by four to obtain the zone's hourly rate of application.

_____ X 4 = _____
Zone's average water depth X 4 = zone's hourly application rate in inches per hour

Step 8: Determine if you are overwatering or underwatering within the zone. Most plants and lawns require only ½" to ¾" of water when plants show signs of stress. Using the zone's hourly application rate, consult the guide below to determine how long it will take to apply ¾" of water.

Zone's hourly application rate	0.5"/hr.	1.0"/hr.	1.5"/hr.	2.0"/hr.
Amount of time to run each zone to deliver ¾"	90 min. run time	45 min. run time	30 min. run time	23 min. run time

Step 9: adjust your sprinkler system timer to deliver the appropriate amount of water for the zone.

Step 10: Repeat for each zone. The catch-can test should be repeated any time the sprinkler system experiences changes, such as the addition of sprinklers, valve replacement, or water source change.

Backflow Prevention

It is important to note that every irrigation system installed must comply with local codes and provide proper prevention of water backflow. In addition to obtaining installation permits, the City of Tampa requires approved backflow prevention on all irrigation systems.

Backflow into a water system can pollute or contaminate the water in that system.

The basic mechanism for preventing backflow is a mechanical backflow preventer, which provides a physical barrier to backflow.

A backflow preventer stops water that is inside your irrigation pipes from returning or flowing back to the source due to suction in the pipes.

For backflow prevention devices to function correctly they must be installed a minimum of 6 to 12 inches above the highest head on the irrigation system, depending on the type installed.

For more information on approved backflow preventer devices and Tampa's installation requirements, please contact the Construction Services Division at (813) 274-3100.

More information on cross-connection prevention and backflow prevention is available on the Florida Department of Environmental Protection website at www.dep.state.fl.us/water/drinkingwater/bfp.htm .

Rain Sensors

A rain sensor is a device or switch that overrides the automatic irrigation system when rainfall occurs. The sensor shuts off a system if it is operating during a rain shower, or is scheduled to run the following day and it has recently rained. It will also return the system to its regular operation during normal weather conditions.

Florida Law (Section 373.62 F.S.) requires that all irrigation systems be outfitted with a working rain shut-off device or other technology to inhibit or interrupt operation of the irrigation system during periods of sufficient moisture.

Do-It Yourself Rain Sensor Check-Up

To ensure proper operation, sensors should be checked at least once a year. Information about types and installation of rain sensing devices is available from the University of Florida.

These instructions are specifically for testing a cork-disc rain sensor. If you have another type, please check with the manufacturer for specific instructions about testing it.

For a cork-disc sensor:

1. Locate the rain sensor for your irrigation system. Typically, it will be located on the roofline or atop a fence. Check to make sure that the top of the sensor is not obstructed by eaves, treetops or other obstructions that keep rain from reaching the sensor.
2. Turn on the time clock for the zone nearest the sensor.
3. Press and hold down the button on top of the sensor. The zone should shut off. (If your rain sensor does not have a button on top, it is not a cork-disc sensor.)
4. Release the button and the zone should come back on. If it does, the sensor is operating properly.
5. If the system does not shut off or come back on, check for wiring problems. The device may have to be repaired or replaced. Check the instruction manual or manufacture's Web site for additional information about your specific brand and model rain sensor.