

Irrigation System Tune-Up Hints... What to look for

One of the best ways to reduce your water use is to ensure that your irrigation system is functioning efficiently. A well designed, well functioning irrigation system applies water uniformly, and does it with an application rate and delivery method that best matches the plants' needs and soil type. Meeting these criteria affords you the best opportunity to effectively schedule irrigation with the least amount of waste and for the greatest benefit to the plants.



But even the best irrigation systems can degrade quickly without regular maintenance, becoming a point source for water waste, runoff, and visibly stressed plants. So if you keep increasing the amount of time you water and your plants or lawn still aren't looking their best, or you don't like the idea of paying for water that's simply going down the gutter—consider a different approach. Tune it up! Get your irrigation system working properly, and then keep it there with an effective maintenance plan.

This plan should cover both substantive repairs done once or twice seasonally, as well as shorter interval check-ups throughout the main irrigation months. Given the high incidence of sprinklers damaged by mower blades and string trimmers, a quick visual inspection and tune-up should be as regular as mowing the grass. So the next time you or your gardener finish clipping the grass or shrubs, turn the sprinkler system on one station at a time and make sure everything is in order. Here are just a few items to check:



▶ **Once or Twice a Season**

▶ **Frequently Throughout the Season**



▶ Start at the irrigation control valves and look for leaks or drips from the valves themselves or from the pipe threads where any pressure regulators or filters have been attached. Threaded connections that leak can be corrected by using a Teflon thread-seal tape or simply by tightening up the connection. Leaking valves may be caused by debris within the valve that creates a blockage of flow, backing up the water within the valve. Disassembly and cleaning of the inside of the valve may remedy this situation.



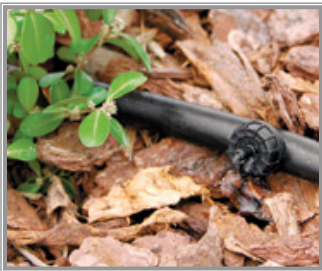
▶ Is the water pressure correct for the sprinkler technology being used? For lawn sprinkler technology, low pressure means poor coverage and poor uniformity, but excessively high pressure wears out parts prematurely, results in unacceptably high application rates, and causes misting that drifts off target. Most pop-up, fixed spray sprinklers work optimally in the 30-psi range, whereas rotor type



Typical pressure regulator

sprinklers have a range of optimal pressures with most near 50-psi. Consult the manufacturer recommendations for *optimal* performance and adjust your system accordingly. Pressure test kits are available from local irrigation supply stores. These dynamic pressure test kits can be used in conjunction with the flow rate adjustment on the valve to set the correct operating pressure for the type of sprinklers you are using. Drip and micro-spray systems should have an 8 to 10-psi pressure regulator installed, accompanied by a filter.

**Pressure checks only need to be done once at installation or again if the system capacity changes significantly for example, when adding or removing sprinkler heads to a station.*



▶ For drip type irrigation, turn on each drip station individually and walk the length of the line(s) making sure each emitter or micro sprayer is working properly. If this means uncovering them from a layer of mulch or poking your way through the bushes, so be it. If you have lines and emitters that are buried under landscape fabric, rather than compromise the weed protection of the barrier by tearing holes in it, you should use the audible leak detection method outlined below. However, if the plants are showing signs of water stress or if you hear a leak, you will need to dig up the line.

Above ground, micro sprayers should be mounted on spikes that are firmly seated in the soil, be unobstructed by vegetation to the point that they are reaching their intended target, and be spraying level to the soil grade. Leaving micro sprayers lying on the surface of the soil creates soil erosion and can excavate the soil away from plant roots. Likewise, wide open, 1/4" lines left lying on the surface to flood irrigate an area are also not advised. It is better to install an emitter at the end that drips as it was intended to do.



▶ Are there mixed sprinkler technologies being used on the same irrigation valve or station? If there are, you have a serious problem regarding application uniformity and scheduling. The difference in application rates between sprinkler types (i.e. pop-up vs. rotor vs. micro sprays) can vary by as much as 1" to 1 ½ " per hour. If you have a station with pop-ups and rotors together for example, the area being watered by the pop-ups will likely be receiving twice as much water as the area being watered by the rotors, in the same amount of time. The system will need to be retrofitted with matched technologies where appropriate. At the very least, you will need to make changes to ensure matched application rates throughout the stations.



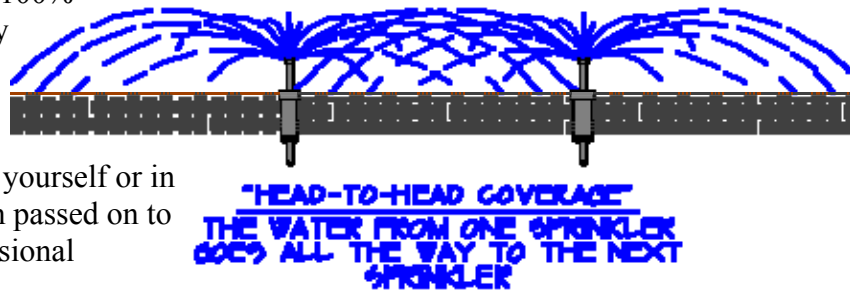
▶ Check to see that the lawn sprinklers have *matched application rate nozzles*. These are required in order to water uniformly when a single irrigation station contains spray heads with a variety of coverage patterns. To demonstrate, let's say on one station you had sprinklers in the middle of a lawn spraying a 360° pattern, some on the edges spraying 180°, the corners on 90°, and the flow rate (the amount of

water being applied) of each sprinkler nozzle was the same. Since the 180° sprinklers would be spraying the same amount of water over an area that is half as big as the sprinklers spraying 360°, then the area covered by the 180° sprinklers would get twice as much water. The area served by the 90° sprinklers would get four times the water as the area served by the 360°. Matched application rate nozzles compensate for this effect by varying the flow rates so that each sprinkler pattern (360°, 180°, 90°) applies the same amount of water over a given area, for a given amount of time.

▶ Are there any tilted sprinkler heads? Pop-up sprinklers should pop up perpendicular to the soil grade. So if the ground is level, the sprinklers should pop up to vertical. If the ground is sloped, the sprinklers should pop up 90° to the grade of the slope. Tilted sprinkler heads mean poor uniformity of coverage, which leads to areas of stress in the lawn. If necessary, dig out a small area around the sprinkler body to adjust it to perpendicular, then backfill with the just removed soil to keep it in place.

▶ Are your sprinklers spaced for head to head coverage? More uniform watering occurs when sprinklers are spaced so that their radius of throw extends out to the adjacent sprinklers. This is referred to as 100%

overlap. No sprinkler technology exists that can overcome the problems inherent in a poorly designed system, so whether you're attempting an installation yourself or in need of a retrofit to fix a problem passed on to you, be sure and get some professional guidance first.



▶ Are there any geysers? If so, don't add to the cost of fixing the problem by continuing to run the irrigation, and thereby running up your water bill. Either make the repair right away by keeping some spare parts on hand, or turn the system off until it's fixed. If you elect to do the repair yourself, you should take the time to understand what type of components you have – manufacturer, model, nozzle type, etc. Replacing what is broken with an incorrect part can create performance inefficiencies, so consult with an irrigation professional if you are unsure what you need. Don't let a hastily made purchase lead to the mistake of installing a new sprinkler that waters halfway across the street and over your neighbor's driveway.

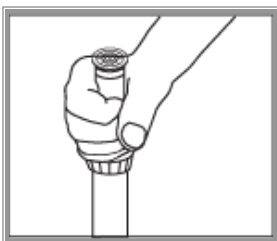
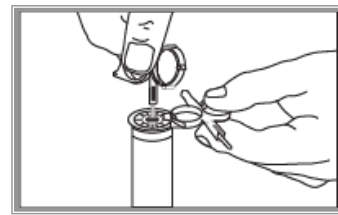
▶ If there are no geysers, are there any sprinklers that are otherwise visibly broken? Inspecting sprinklers from a distance does not work. Walk around and get up close to each spray head. Look for small streams of water spraying vertically from the tops of sprinklers that could indicate a small crack or chip. Sometimes the break is lower down on the sprinkler body and creates a disruption of the spray pattern as the water from the break sprays upward. Often, leaks occur not from breaks, but when sand or other

particles, trapped between the sprinkler body and the pop-up riser, wear grooves into the side of the riser over time, allowing water to escape past the seal.



Breaks that occur below the surface, where the sprinkler attaches to the delivery pipe, will often excavate a space around the sprinkler, with water bubbling up from below while the sprinkler continues to spray. More severe breaks in a below ground transmission pipe will create a noticeable loss in system pressure, where many of the sprinklers won't pop up, and the ones that do, don't spray very far. Large breaks don't always manifest as visible eruptions of water from the ground, so if there is a severe drop in pressure, don't wait—investigate the problem immediately or call someone qualified to help you if you can't do it yourself.

► Adjust the distance of spray so that no hardscape (sidewalk, street, patio, deck) is being irrigated. If your sprinklers are over spraying their intended target, check to see if the nozzle is right for the size of the lawn you have; meaning, if your lawn is 8' wide and your sprinkler nozzles were designed to water a 15' radius, someone installed the wrong ones and you should change to a smaller radius nozzle. Once you get the correct radius, fine-tune the distance with the adjustment screw located on top of each pop-up spray head, or by whatever means provided by sprinkler and manufacture type.



► Adjust the direction (pattern) of spray so that no hardscape is being watered. This type of adjustment may simply require turning a misdirected head to better spray the intended target (don't be shy – just reach down, grab hold of the pop-up, and turn); or it could require replacing a poorly chosen fixed-arc spray head with a fixed-arc of the correct pattern; or with an adjustable type better suited for oddly shaped areas. Rotor type sprinklers often require a small tool to be inserted into the top of the sprinkler head to adjust the area being sprayed, so make sure you have one on hand.

► Are there any clogged sprinklers? Clogs severely impair the uniformity of water being applied. Look for sprinkler spray patterns that have visible interruptions in the intended pattern. For example, if a pop-up sprinkler with a 180° spray pattern has a 10° gap where no water is coming out, there's a good chance that debris stuck in the nozzle is the cause. Clogs in rotor type sprinklers will noticeably change



the dispersion appearance and watering distance of the stream. Clogs in impact type sprinklers often result in a “stuck” sprinkler, where the stream of water stays over one spot in the lawn. A paper clip gently inserted into nozzle openings can quickly dislodge smaller obstructions, with the key word being *gently*. You don’t want to damage the nozzle or change its aperture. Larger blockages will require disassembly and cleaning of the sprinkler head.

▶ Are there any blocked or deflected sprinkler spray patterns? There are many types of obstructions; shrubs, flowers, or trees growing into and over lawn sprinklers; excessively high turf heights; pop-up sprinklers that no longer pop up taller than the grass, even when it’s mowed; landscape features added after the installation of a lawn (raised beds, retaining walls, ornamental sculptures), and more. Do your best to ensure that the area around the sprinklers remains unobstructed, or (in the case of overly short pop-ups and newly added landscape features) consider retrofitting the system to meet the currently existing conditions.

▶ For drip systems, the best approach to take for problem identification is to use your ears as much as your eyes. Where drip lines and emitters are covered with mulch or have been overgrown by larger shrubs, it would be impractical to perform frequent visible checks that require digging everything up or hacking through bushes to see if everything’s working properly. Rather you should turn it on, wait until after the line has pressurized (allowing all the air in the line to be expelled), and then walk slowly along from beginning of the drip line to the end, listening for the sound of water jetting into the soil or spraying into the plant structure. Most drip emitters are quiet after the initial pressurization, so any unusual noise after that time should be considered a possible leak that warrants further investigation. When you first use this approach you will encounter a lot of anomalous noises that, upon investigation, don’t lead to leaks. With time though, you will get better at identifying which sounds are true problems.



Although this checklist is not an exhaustive list of the problems you may need to address with your irrigation system, just working on these few areas will greatly improve your water use efficiency. If you would like help identifying other aspects of your irrigation system that could use improvement or simply need help with any of the concepts mentioned above you can **call 838-5357 to make an appointment for a Water Smart Home Program water use assessment.**