

Sprinkler Checkup Supplemental Index

Sprinkler systems are understandably popular for the convenience and the timesavings they provide for their owners. Logically, they should provide water savings due to timing devices and the potential for more even water application. However, property owners often don't recognize easily correctable problems with their system. This means that systems often fail to live up to their potential due to a combination of equipment issues (design and maintenance) and scheduling practices. While no sprinkler system will ever apply irrigation water perfectly, a properly designed, well-maintained automatic sprinkler system can meet the needs of drier areas while reducing the tendency to over-water others.

A well-designed, modern automatic sprinkler system can provide years of dependable service. However, they still contain many mechanical and electrical parts that can fail over time. Other components can be knocked out of alignment or even broken during routine landscape maintenance. To complicate matters, if you follow our scheduling advice, much of your irrigation system's operation will occur during non-daylight hours. This makes it easy to miss sprinkler system problems.

The following may be helpful in avoiding water waste, and the loss of landscape elements:

- ✓ Sprinklers can change direction over time. Shrubs and trees may grow and block some of your sprinkler heads. Pipes can break or crack, and rotary edgers can damage sprinkler heads. **That's why it's a very good idea to occasionally observe your sprinkler system's operation**. The easiest way to do this is to use the 'manual' operation feature on your controller at a day and time most convenient for you. Then just walk the entire yard looking for leaks, sprinklers spraying the sidewalk, and anything else that looks wrong. At a minimum, a visual inspection should be performed when the system is activated in the spring, and **at least** once again during mid-summer.
- ✓ If your gardener is responsible for the operation of your sprinkler system, you might make this one of his/her duties. While many gardeners are not irrigation experts, nor licensed to perform sprinkler repairs, they can still help identify problems requiring immediate attention.
- ✓ When working towards making changes to your irrigation system please make sure that the person or people doing the work have the appropriate level of license. A Standard License is not sufficient to install a sprinkler system or make large repairs to an existing system; they must have an Irrigation Only License or an All Phase License. Anyone doing irrigation work that is not properly licensed risks being fined by the Landscape Contractors Board. Please refer to www.oregon.gov/LCB for more information.
- ✓ Pay close attention to changes in the appearance of your lawns, shrubs, and trees. No one knows your landscape quite as well as you do. If a plant or patch of turf looks wilted or droopy, or is turning yellow or brown, it may be a water-related problem. However, recognize that it could just as easily mean you are giving it **too much** water. It also may be due to pests or disease. The sooner you take steps to correct landscape problems, the better.

How well a sprinkler system performs is primarily a function of two key factors: ***scheduling and uniformity***.

Scheduling refers to how many days per week, and how many times per day, along with how long each part of a landscape receives irrigation. It is one of the most important factors in determining efficient water distribution from a sprinkler system, but also the easiest to fix.

Uniformity refers to the evenness with which water is applied. The result of many factors, uniformity is important because without relatively equal water application, there will be some very wet spots and other very dry spots. Turfgrass is particularly sensitive to uneven water application, with poor uniformity often leading to over-watering much of the lawn in an effort to keep the drier spots green.

Scheduling Recommendations:

The greatest amount of water savings can often be realized through improved irrigation scheduling. During the months when sprinkling is usually necessary, water needs for lawn areas tend to vary from one to two inches of water per week. Since it seldom rains in our area during some summer months, it is up to your sprinkler system to make up the difference. Initially setting the watering schedule correctly, and adjusting the schedule throughout the watering season to meet changing weather conditions, is important to both efficient watering and a healthy landscape. Please consider the following recommendations when setting up your sprinkling schedule:

- ◆ Spray sprinklers apply water more than twice as fast as rotors. This means that spray zones should run for less than half the time of rotor zones in order for all lawn areas to receive the same amount of water.
- ◆ Consider using multiple start times, which helps get water deep into the soil and encourages deeper roots.
- ◆ Make use of your controller's multiple programs to separate lawn and shrub zones to cut down on the number of days the shrubs receive water. This will encourage deeper roots, which means plants won't become stressed as quickly in hot weather.
- ◆ Plants receive water as well as oxygen from the soil. Over-watering can be just as damaging as under-watering, since it can potentially cut off the air supply to the soil. Thus, lawn watering should take place no more than 4 days a week, and shrub watering should only occur 2-3 days per week. Allowing the soil to dry out a little in between watering days ensures that there is enough open space in the soil for air to penetrate.
- ◆ Take advantage of the **"Percentage Adjust"** feature on your controller during periods of unseasonably hot or cool weather. It is much simpler than cycling through and changing the run time on every zone.
- ◆ In addition, it is best to run sprinklers as early in the morning as possible because sun and wind significantly increase evaporation when the sun is out.

Suggested Watering Schedule:

Please refer to the following **“Sample Lawn Watering Schedule”** as a recommended watering schedule. It is a good starting point when determining how much and how frequently you should be watering your lawn. Please note that it gives suggested total watering times per week for your lawn. The schedule assumes typical output for spray /rotor sprinklers. If you adopt these schedules, you should pay especially close attention to any changes in lawn health, color, etc. and adjust the schedule as necessary. **You can also call our “Lawn Watering Infoline” at 541-774-2460, which is updated weekly throughout the summer with our current recommended run times for both sprays and rotors**

Biweekly Period	Approximate Lawn Water Needs (Inches <u>per Week</u>)	Total Watering Time <u>Per Week</u>		
		Standard Sprays	Rotor Heads	Rotating Nozzles
May 1-15	1.04	42 minutes	100 minutes	156 minutes
May 16-31	1.21	48 minutes	116 minutes	181 minutes
June 1-15	1.40	56 minutes	134 minutes	210 minutes
June 16-30	1.59	64 minutes	153 minutes	238 minutes
July 1-15	1.76	70 minutes	169 minutes	264 minutes
July 16-31	1.71	68 minutes	164 minutes	256 minutes
Aug 1-15	1.50	60 minutes	144 minutes	225 minutes
Aug 16-31	1.33	53 minutes	128 minutes	199 minutes
Sep 1-15	1.09	44 minutes	105 minutes	163 minutes
Sep 16-30	0.84	34 minutes	80 minutes	126 minutes

Use this schedule as a reference, making adjustments as needed to reflect actual weather, site conditions, specific sprinklers being used, and the type of plants being irrigated. When water needs are met by rain, reduce sprinkling accordingly. Run times are based on average results for various sprinklers. They assume an application rate (a.k.a. Precipitation Rate or PR) of **1.5** inches per hour for standard spray heads, **0.625** inches per hour for gear-driven rotor sprinklers, and **0.4** inches per hour for multiple stream rotating nozzles.

Shrub Watering Schedule:

The sample schedule provided is for lawn areas only. Most shrubs and trees prefer deeper, less frequent watering. Here are some additional tips:

- ✓ If your timer has multiple program capability, try placing your lawns on program ‘A’, and your shrub/tree zones on program ‘B’. This will allow you to water your lawns more frequently than shrubs. To conserve even more water, consider switching your trees and shrubs to drip irrigation.

- ✓ Shrubs typically need 1/3 to 2/3 as much water as lawns, and with their larger and more robust root systems, neither require nor prefer water as often as turfgrass. You may want to adjust your shrub zone watering schedules with this in mind.
- ✓ Drip irrigation systems are a very efficient means of watering non-turf areas. The drip irrigation guidelines we gave you will help to determine your watering schedule based on the number and size of emitters provided for each plant, along with the size, type of environment, and the water usage of each plant. The moisture meter should provide you with a useful tool in assessing whether your schedule is providing sufficient water to individual plants. If you find that some plants seem to be getting plenty of water and others seem dry, adding more emitters to the dry plants can help.

When to Water:

Sprinkling during daylight hours is discouraged because sun and wind significantly increase evaporation. Midday watering may even damage your grass. While watering in the evening is popular, high temperatures and wind are often still a problem at that time of day. Additionally, sprinkling when the sun is out can greatly increase the amount of water lost to evaporation. Daytime temperatures often peak around 4:00 p.m. and evening breezes are common, so wait until *at least* after dusk if you prefer evening sprinkling. Our recommended watering window is **9:00 p.m. to 6:00 a.m.**

How to Water:

Your timer has multiple start time capability, and utilizing it will allow you to split a day's watering into two or more cycles. This can be particularly beneficial in our region where clay soils tend to absorb water very slowly. "Cycle and soak" irrigation allows water from each cycle to absorb into the soil before more water is applied. For example, the "**Sample Lawn Watering Schedule**" suggests sprinkling during the first part of June for 56 total minutes per week when using standard spray heads. Splitting this time among three watering days would mean 18 minutes of run time each watering day. Rather than applying this water all at once, as you are currently doing, try splitting each day's watering into three cycles of 6 minutes each. To do this, set the timer for three start times per watering day, each spaced about an hour apart (but make sure to leave enough separation between start times to allow all zones on that program to finish running before the next cycle begins).

Please note that this proposed watering schedule is based on a decade of locally observed data. It provides a good general reference. If you wish to even more closely match your irrigation to the current weather, you can call our Lawn Watering Infoline (541-774-2460) which provides approximate lawn water needs for the week.

Also, while our proposed schedule is based on long-term weather conditions combined with on-site observations, actual weather will vary somewhat from averages, and water needs vary from site to site according to such factors as grass type, soil characteristics, slope, and how much sun an area receives. Because of this, you should utilize any MWC-recommended schedules as a starting point only. Adjustments may be necessary based both on actual weather conditions and on your own observations. In making adjustments, it is probably also best to make modifications a little at a time, and evaluate results before making further adjustments. You may even find that you can maintain a green lawn with less water than these numbers indicate. Keep in mind that making some of the sprinkler repairs and modifications suggested could result in

substantially improved water application, and in turn a meaningful reduction in necessary watering time.

Each sprinkler zone may have somewhat different conditions. It is suggested to visually check plant health and soil dampness to determine if too much or too little water is being applied and adjust time accordingly. Remember shrubs and trees are much different from lawn and require a much different watering schedule. It is suggested that deeper, less frequent watering occur in these areas. Use the moisture meter we provided to monitor soil moisture levels to help you evaluate whether your schedule is providing sufficient deep watering. Remember to give the soil some opportunity to dry out some between sprinklings, which encourages deeper plant roots.

Sprinkler Controllers:

Timing devices commonly known as irrigation controllers or sprinkler timers operate automatic sprinkler systems. Setting your controller's initial watering schedule correctly is important, as is adjusting it regularly throughout the watering season as the weather changes. *In addition, annually replacing the back-up battery will allow the controller to maintain your sprinkling schedule in the event of a power outage.*

Many newer controllers have features that can make it easier to water efficiently. If your system's controller appears to be old, it may lack many of these features. Upgrading your controller can be one of the most worthwhile improvements you can make to your sprinkler system. If your controller works fine, but is not as 'user friendly' as many models, you may understandably find it confusing. Feel free to call us for characteristics to look for if you decide to replace it at some point. If your system controller is working well, you should consider the features you may not be using. You may wish to review your owner's manual to become familiar with these and determine whether they might be useful for you. Some features we find especially useful include:

- ◆ ***Multiple programming:*** Since lawn, shrub and drip areas have different sprinkling needs, it is helpful to have the ability to program more than one irrigation schedule, both as to frequency and length of cycle. For example, you can program lawn areas to operate 4 days per week under Program A and shrub areas for 2 or 3 days per week under Program B.
- ◆ ***Multiple start times:*** This is the ability to run each sprinkler zone more than one time per watering day. It can be a very helpful option, enabling you to water with the 'cycle and soak' method we described previously.
- ◆ ***Water Budget or Percentage Adjustment:*** This feature allows you to adjust the watering times for all of your sprinkler zones at once with a single button, making frequent programming adjustments much easier. For example, if we had a week of very hot (i.e., "record-breaking") weather, rather than adding time to the schedule zone by zone, you could simply use the percentage adjustment key to increase from 100% to 110% or 120%. On the other hand, this feature can also be used to **reduce** all watering times if we have a period of unusually cool weather by decreasing the 'budget' from 100% to 90% or 80%.
- ◆ ***Weather based controllers:*** This style of sprinkler controller automatically adjusts watering times based on current weather conditions. Some controllers have their own weather station, which is usually installed on a rooftop, and some receive local weather

information from broadcast signals. Additionally, some of these timers can be controlled with a personal computer.

Rain:

- ◆ Reduce or even eliminate irrigation whenever there is measurable precipitation. This can often be done easily by setting your controller to “RAIN” or “OFF” to shut it off manually until dry weather returns. There are also automatic rain shut-off devices available that are inexpensive and are not difficult to install. After sufficient rainfall, the sensor tells the controller to skip the next scheduled watering session. When the rain stops, the controller returns automatically to its regular program.

Uniformity Issues:

- ◆ **Excessive pressure:** Sprinklers are designed to operate within certain water pressure ranges. For instance, many gear-driven rotor sprinklers operate best above 30 PSI (pounds per square inch), with an optimum operating pressure of 45 PSI. Standard spray heads, on the other hand, have an optimum operating pressure of 25 - 30 PSI, but perform poorly above 30 PSI. Multi-stream rotators operate best between 40 – 45 PSI. Drip systems are designed for pressure levels ranging from 20 - 30 PSI. Pressure levels above these ranges can place significant strain on a sprinkler system, making them susceptible to leaks, blowouts, and other problems. In addition, standard spray heads tend to have poor distribution and extreme “misting” under high pressure, which wastes water.
 - ✓ Under these circumstances, one of the most beneficial modifications is to add pressure reduction to the sprinkler system. The best way to accomplish this is to install the device at the valve assembly, although replacing individual sprinklers with models that contain pressure reducers is also an option. Adjusting flow volume with sprinkler valves can also help but may stress the valves and reduce their life spans.
- ◆ **Insufficient pressure:** Sprinklers are designed to operate within certain water pressure ranges, measured in pounds per square inch (PSI). For instance, many gear-driven rotor sprinklers operate best above 30 PSI, with an optimum operating pressure of 50 PSI. Standard spray heads, on the other hand, have an optimum operating pressure of 25-30 PSI, but operate poorly below 20 PSI. Multi-stream rotators operate best between 40 – 45 PSI. Drip systems are designed for pressure levels between 20 - 30 PSI. Insufficient water pressure can affect uniformity by causing sprinklers to not fully pop up or seal properly, which may reduce the amount of water that reaches your lawn. Overdevelopment of a sprinkler zone draws a large amount of water at one time, causing the water pressure for the entire zone to drop. Low pressure can be the result of several factors, but here is a list of the most common reasons:
 - ✓ If you have more sprinklers in a zone than you have pressure to accommodate, you might consider turning some of the sprinklers off (with the screw on the top of the nozzle) and see if this results in the rest of the sprinklers working better. If so, on the short term, it may be worth manually watering part of the zone in order to enable the rest of the zone to work better. If you have zones that water both shrubs and lawn, which is not an ideal situation regardless, turning off the

sprinklers in the shrub areas might be the most logical, since they can be watered easily and effectively with soaker type hoses. A more permanent solution might ultimately require system re-design that breaks up sprinkler zones into smaller areas with fewer sprinklers per zone. Another way would be to change all the nozzles in the zone in question to MP rotator nozzles, which will reduce the amount of water that is flowing in the zone, thus creating better hydraulics.

- ✓ A malfunctioning irrigation valve can cause insufficient pressure. Valve replacement is usually necessary if this is occurring. If the affected zones once operated well and no changes have been made since, you should explore this possibility further.
 - ✓ Older houses and sprinkler systems may have galvanized piping. If so, insufficient pressure problems may relate to the aging of the galvanized pipes. Even when new, galvanized pipes will tend to have more pressure loss from friction than other types of piping. Losses become greater as galvanized pipe ages. These pipes tend to become pitted and collect mineral deposits, making the pipe opening smaller and rougher. If pressure problems are only evident with your sprinkler system, this may involve just your sprinkler piping. However, if you also notice low pressure and water flow with your interior plumbing, especially when multiple water uses are occurring simultaneously, your main water line might be a primary or contributing factor. Pipe replacement is the only solution to this problem.
- ◆ **Low head drainage:** Water that flows out of one or more sprinklers after the system shuts off is usually due to "low head drainage". It often occurs when the sprinkler system is installed on a sloped area. After the sprinklers are turned off, the water that is in the pipes drains out through the lowest sprinkler heads and is replaced with air. This wastes water. In addition, all that air being forced through the lines every time you turn on the sprinklers can put a lot of stress on pipes and sprinklers.
- ✓ The addition of check valves at the sprinklers that are draining should correct this. While some sprinklers can be retrofitted with check valves, generally the easiest remedy for this is to simply replace the low sprinklers with a comparable sprinkler that has a check valve built in. Check valves and sprinklers with built-in check valves are usually not available at discount stores or local hardware stores. They can be purchased from a local irrigation specialty store, online, or from a professional irrigation contractor.

PLEASE NOTE: If you install check valves, make sure you winterize those zones after the watering season ends. Water trapped in sprinklers and piping can freeze and cause damage. Hiring a professional to blow the system out with compressed air is ideal, but loosening nozzles and propping them open briefly to drain may be sufficient.

- ◆ **Improper nozzle selection:** Sprinklers come in many configurations and with a variety of nozzles from which to choose. It is important to measure the distance you will need the sprinkler to throw water and select a nozzle that will not throw much further past that distance, in order to prevent overspray. However, the nozzle not only

determines distance, it also determines the *quantity* of water the sprinkler applies (example: 2 gallons per minute). In rotor sprinklers, that quantity is generally the same whether the sprinkler is spraying a quarter circle, half circle or full circle.

- ✓ While it may not be possible to perfectly balance output and spray distance, keep in mind that if a sprinkler will be covering a full circle, it should have a nozzle that applies close to twice the volume of the nozzle on a sprinkler spraying a half circle with the same radius, and so forth. With rotor sprinklers, it can also be helpful to utilize low angle nozzles for the higher volume sprinklers, and use the adjustment screw as this can provide a shorter spray distance while maintaining water output. Replacing nozzles is not difficult, but since nozzle selection can be complicated, you may wish to obtain some assistance from an irrigation professional.
 - ✓ Select nozzles that have a throw distance that is close as possible to the length of landscape you need to water. If needed, there are special spray nozzles that throw water farther to the sides than out in front of it, which are useful for narrow strips of grass.
 - ✓ It may also be beneficial to replace some standard spray nozzles with variable arc nozzles (VANs), which would help you to tailor sprinkler patterns to the shape of your yard.
- ◆ ***Improper sprinkler selection:*** The size and shape of your lawn usually determines which sprinkler type should be used. In general, smaller lawn areas benefit from the use of standard spray sprinklers, which have a range of 4'-18' at 20-30 PSI. Multiple stream rotating sprinkler nozzles have a medium range of about 8'-30' at 25-50 PSI, and can be installed on existing spray sprinkler bodies. They are available in similar nozzle sizes as sprays, but apply water less quickly (which helps water soak into the soil instead of running off or pooling). If you have a large lawn area to cover, choose gear-driven rotors, which can cover distances of 13'-50' at 60 PSI. Impact rotors are another option, however their internal parts are exposed, and dirt, bark, or grass blades may cause damage to them. Sprinkler pop-ups should have a minimum pop-up height of 4 inches in turf areas to provide enough clearance above the grass.
- ✓ Be sure to select sprinkler models carefully and choose the type that is best suited to the length and area of your lawn. Using the wrong type of sprinkler can cause landscape problems. For instance, using rotors in a small area will result in significant overspray, while sprays in large areas may cause dry spots due to insufficient coverage.
- ◆ ***Sprinkler placement issues:*** Ideally, the spray from one sprinkler should reach at least to each adjacent sprinkler. This is called "head-to-head coverage." There should be some overlap because uniformity is improved if all parts of a lawn are getting water from more than one sprinkler. It is generally best to have sprinklers located in corners and around the edge of the lawn that spray inward and complement sprinklers spraying from the middle or opposite side. Otherwise, it is difficult to obtain uniform watering to the edges of the lawn. Placing sprinklers too close to each other in an attempt to add more water to an area often results in over-watering, which can be just as damaging as too little water. Good sprinkler design and selecting the appropriate nozzles for the area

to be watered will eliminate the need to “double-up” and place a new sprinkler right next to another.

- ✓ Depending on the area to be watered, sprinklers that are too close to another sprinkler can be spaced out or completely removed.
 - ✓ If sprinklers are spaced too far apart to overlap each other, it may be possible to move them or add a few sprinklers in key locations. However, adding new sprinklers might not be possible without adding another sprinkler zone. Determining this would require an analysis of available water pressure and flows in this sprinkler zone, so it should be attempted only after consultation with an irrigation expert.
 - ✓ If sprinklers are not located in corners and around the edges, it may be possible to move them. This would usually be accomplished by using flexible pipe with a swing joint, which allows individual sprinklers to be placed farther away from the underground pipe. Contact us if you would like more information about this.
 - ✓ If adding additional zones and more sprinklers is not feasible, then consider running a hose-mounted manual sprinkler in these lawn areas, using a hose that is operated by a hose bib timer.
 - ✓ Check your drip system periodically to make sure the emitters are getting water to areas that need it. If emitters are watering an area with no plant material, move them to a nearby plant or remove them completely to prevent water waste.
- ◆ **Obstructed sprinklers:** Over time, sprinklers can become blocked by shrubs, trees, etc. that grow over them. This results in excessive water deposited near the sprinklers and little, if any, water reaching the lawn.
- ✓ If plants are in the way, either trimming them back or moving the sprinklers out from under the plant to the edge of the lawn can resolve this issue.
- ◆ **Buried sprinklers:** Grass growth can cause sprinklers to become too low in the ground, or “buried”, which can cause the grass around it to deflect the spray. This results in excessive water deposited near the sprinklers and little, if any, water reaching the lawn.
- ✓ If the sprinklers are buried, they can be raised by digging down and adjusting them by hand or by checking with an irrigation supplier for adaptors designed for raising sprinklers.
- ◆ **Tilted sprinklers:** Generally, sprinklers work best when the top of the sprinkler is parallel to the grass surface around it. When sprinklers become tilted, it can distort their spray pattern and prevent proper operation.
- ✓ You can usually straighten tilted sprinklers by digging carefully around the sprinkler body, straightening the unit, then carefully tamping the soil back down, making sure not to cover the top of the sprinkler.

- ◆ **Misaligned sprinklers:** Sprinklers can shift in aim so that they are now watering sidewalks, driveways, streets, or fences – and missing parts of your lawn. This is a common problem, so inspecting sprinklers on a regular basis is advised. You can lessen or even eliminate alignment problems by making some minor adjustments to your sprinklers.
 - ✓ On standard spray heads, pulling up the nozzle and rotating it to the correct position usually resolves the issue. If a rotor is covering a distance that is too wide, the watering “arc” may be scaled down by turning the adjustment screw typically on the top of the nozzle with a small tool, after setting the fixed side of rotation.
 - ✓ If VANs (Variable-Angle Nozzles) are present, turning the adjuster ring located on the nozzle will fine-tune the spray patterns to provide better uniformity with less overspray onto walks, streets, etc. Doing this yourself (or having your landscaper do it) at least once a year can enhance landscape health while also conserving water. If you have questions about how to make these adjustments, please feel free to call us.

- ◆ **Old / worn equipment:** As with most things, sprinkler equipment wears out over time. This generally becomes evident by poor mechanical performance. Controllers that cannot be programmed, valves that leak, or sprinklers that won't perform properly can cause problems in the landscape. Replacing the product with the same or similar is usually the solution.
 - ✓ You can often replace the inner workings of many worn sprinklers or valves, without having to dig it up, if you get the exact same one.
 - ✓ Otherwise, to replace a sprinkler begin by digging carefully around the sprinkler body exposing the connection to the pipe that serves it. Remove and replace the sprinkler, refill the hole, carefully tamping the soil back down (but making sure not to cover the top of the sprinkler).
 - ✓ Replacing valves is usually best left to an irrigation professional. When working towards making changes to your irrigation system please make sure that the person or people doing the work have the appropriate level of license. A Standard License is not sufficient to repair a sprinkler system or make large repairs to an existing system; they must have an Irrigation Only License or an All Phase License. Anyone doing the work that is not properly licensed risks being fined by the Landscape Contractors Board. Please refer to www.oregon.gov/LCB for more information.
 - ✓ For controllers that need replacing, it is recommended to find one which is easy to program and has features described earlier in this report.

- ◆ **Damaged piping:** Modern in-ground sprinkler systems are made mostly of plastic and other materials that are easily broken. Damaged pipes can lose significant amounts of water creating damage to surrounding soil, landscapes or hardscapes. This will also interfere with the proper operation of the sprinkler system. The causes of damage can come from excessive pressure/water hammer, digging or freezing.

- ✓ Repairing damaged piping as soon as possible with the correct material is the best way to solve the problem. Basic repair supplies can be purchased from local hardware stores or irrigation professionals.
 - ✓ If hiring someone to repair your irrigation system, please make sure that the person or people doing the work have the appropriate level of license. A Standard License is not sufficient to install a sprinkler system or make large repairs to an existing system; they must have an Irrigation Only License or an All Phase License. Anyone doing the work that is not properly licensed risks being fined by the Landscape Contractors Board. Please refer to www.oregon.gov/LCB for more information.
- ◆ **Damaged sprinklers:** Modern in-ground sprinklers are made mostly of plastic and other materials that can be damaged by foot traffic, pets, lawnmowers, weed whackers, and edgers. Damaged sprinklers can leak significant amounts of water, spray too much water in some areas, and leave other areas completely dry. There could be a variety of causes for damage, from worn seals to stripped gears, or the pop up not sealing properly.
- ✓ Replacing damaged sprinklers with a comparable model can solve the problem. Basic sprinkler supplies can be purchased from local hardware stores or irrigation professionals.
- ◆ **Leaking sprinklers:** Over time, sprinklers can develop leaks from normal wear and tear. They can leak from a few different places. Depending on the location of the leak, it can be relatively easy to fix or may require some digging.
- ✓ If the sprinkler is leaking where the cap meets the body of the sprinkler, tightening the cap by hand can usually stop it.
 - ✓ If the sprinkler is leaking out where the nozzle attaches to the pop-up, pulling up the nozzle and hand tightening it should be sufficient.
 - ✓ Wet ground surrounding a sprinkler with no visible leak above ground might indicate leaking where the sprinkler meets the underground piping. This may require digging around the sprinkler to determine to origin of the leak and its repair.
- ◆ **Clogged sprinklers/emitters:** All sprinkler types are susceptible to clogging. Dirt, mulch, rocks, and other debris can find its way into sprinklers when they retract, which can plug the nozzles and/or prohibit them from closing. In addition, pipe repairs can often introduce foreign materials into the system. Cleaning sprinklers and drip pipes regularly will lengthen their lifespan, improve coverage and possibly help prevent many a malfunction.
- ✓ Check for debris or damage on a regular basis and clean when necessary. This can be done by rinsing or replacing the filter, which is located below the nozzle. If a repair has been completed within the past few years, check nozzle filters periodically for small chips of plastic or PVC piping.

- ✓ Some sprinklers have nozzles that do not come off the sprinkler, therefore are more difficult to clean. It requires the removal of the cap & riser assembly to access the screen.
 - ✓ To unclog a drip emitter, pull it from its water source. Visually inspect the inlet for debris. Using air or water, flush the emitter backwards through the outlet to dislodge the clog.
 - ✓ If clogging is due to the water source, install a filter into the mainline ahead of the system.
- ◆ **Mixed sprinkler types:** To achieve uniform water application, it is important that all sprinklers within a sprinkler zone apply water at similar rates. This is especially difficult to do if a single zone uses a combination of sprays, rotors and/or drip. Spray heads usually apply water at a much higher rate (typically more than 1 ½ inches in an hour) and have shorter spray patterns than rotor styles of sprinklers (which tend to apply water at around ½ inch per hour). Additionally, while rotor and spray sprinklers use water in gallons per minute (GPM), drip systems use water in gallons per hour (GPH), thus they should not be zoned together with rotors or sprays.
- ✓ This problem can be resolved either by changing out sprinklers to ensure they are all the same type, or by re-zoning your sprinklers so that each zone has only one type of sprinkler. We strongly advise that consultation with a certified irrigation contractor or irrigation specialty store to assess the hydraulics of your system before completing the suggested changes.
- ◆ **Mixed lawn and shrub zones:** Ideally, each sprinkler zone should cover plants with similar water needs. Lawn and shrubs have very different water needs, both in terms of amount and frequency. Lawns need more water with greater frequency than shrubs. If they are zoned together, shrubs will receive more water than they need.
- ✓ The best solution to this would involve re-designing your irrigation system to place these areas in separate zones. A re-design of the landscape is another option. All non-functional lawn areas are good candidates for replacement with shrubs, trees and groundcovers.
- ◆ **Spray sprinklers in shrub zones:** Sprinklers in shrub areas are often obstructed by foliage. This can affect the uniformity of your sprinklers by blocking water from getting to where it is needed. In addition, spray sprinklers apply water very quickly, so using them in shrub areas may cause inadvertent over-watering.
- ✓ If you use spray heads to water shrubs and trees, try reducing weekly run times by 1/2 to 2/3 in comparison to lawn areas.
 - ✓ While pruning and moving sprinklers are options, converting these areas to drip or bubbler systems served by a separate zone could be a better solution. Drip irrigation systems apply water slowly and directly to the plant root, which ensures that shrubs receive water where it is needed, little water is lost to evaporation,

and foliage will not be damaged by strong sprinkler spray. This can dramatically reduce the amount of water used and often better meets the needs of shrubs.

- ✓ For areas within shrub beds where flowers are planted, consider converting these areas to low volume micro-sprays in conjunction with a drip system.
- ◆ **Small / narrow lawn areas:** These areas are nearly impossible to irrigate efficiently. Sprinklers usually overshoot the lawn area, throwing water onto driveways, buildings, etc. This not only wastes water but also can be damaging to non-lawn structures.
 - ✓ While changing nozzles to better fit the lawn area (if possible) can help, the best way to resolve the issue is to replace all non-functional lawn areas with planter beds, footpaths or other non-lawn features. This would both conserve water and reduce, or possibly eliminate, the maintenance associated with lawns.
- ◆ **Sloped areas:** Lawns planted on sloped surfaces are nearly impossible to irrigate efficiently. Traditional spray sprinklers tend to apply water very quickly, so water tends to run off the slope before it can be absorbed into the soil.
 - ✓ If spray irrigation is utilized on a sloped area, attempt to install sprinklers that have the lowest application rates possible. Equipping them with micro-spray nozzles may be an option in some circumstances. Also, slopes oriented towards the south and/or west can be especially challenging for turf grass since they receive the most solar radiation during the summer. Ground covers and/or shrubs watered with a drip system are usually a better choice for significantly sloped ground. Adding terraces to reduce slopes could greatly reduce runoff and are often attractive as well.
- ◆ **Lack of / inadequate backflow protection:** Backflow assemblies are devices that prevent water that may have been exposed to contaminants from being drawn back into the drinking water system. State health rules specify where such devices are needed, how they are to be installed and establish requirements for annual testing. Since water within irrigation pipes can contain microbes and garden chemicals, all irrigation systems must be equipped with backflow prevention devices.
 - ✓ For more information on this topic, please refer to our backflow prevention brochure, or contact our backflow prevention specialist, Julie Alvis, at 774-2450.
- ◆ **Manual / old systems:** Many older homes have either no in-ground sprinkler system, old systems that include galvanized piping or systems that must be turned on and off manually.
 - ✓ If your sprinkler system is an older installation and operates manually, it may be worth considering a retrofit and/or replacing some or all of the system. While your manual system makes watering easier than moving hoses around, you are not able to take advantage of nighttime watering, and it is less likely that you will water for precise amounts of time. For now, we encourage you to set timers to remind you when you need to turn off sprinklers. At some point, you may wish to consider converting your system to be able to operate it automatically. If you do so, make sure you obtain a controller with a sufficient number of stations to

operate the number of sprinkler zones that your master plan suggests you will ultimately need. Meanwhile, you should consider using a mechanical or electronic timer that can be attached to the hose bib in your back yard. These devices can make manual watering more convenient, without worries about forgetting to shut off the water.

- ✓ If the piping for your system is galvanized metal, the long-term condition of your pipes is highly dependent on how corrosive the surrounding soil is, and varies significantly from one location to the next. Even if your pipes are still in good condition, metal systems are not easily adapted, and people are often nervous about attempting maintenance for fear of stripping threads or otherwise doing more damage.
- ✓ If your system has older brass spray sprinklers, your system will tend to have a very high water output. Older brass sprinklers do not pop up as high as the newer sprinkler models so surrounding grass is more likely to obstruct the spray. Brass sprinklers also have a higher spray pattern, which tends to cause more wind drift – and particularly if they are already misting due to high water pressure. Sputtering and/or failure to pop up caused by corrosion and/or mineral build-up also seem to be common complaints. In short, brass sprinklers are not nearly as ‘user friendly’ and lack the adjustment flexibility of newer models. Replacing these units with a new model is possible, but it often requires changing the riser or replacing it with a swing assembly.
- ✓ If you decide to add an updated system in two or more phases, you should try to master plan the entire system before starting work to ensure that you end up with a complete system with compatible features that functions well.

Drip Irrigation Systems:

Most residential landscapes with tree and/or shrub areas can benefit from the use of drip irrigation. Drip systems apply water directly to the root area and tend to result in far more efficient water application to shrubs and trees when compared to sprinklers. In addition, with drip irrigation, there is often less fertilizer/nutrient loss due to reduced leaching and soil erosion. Since the water is applied slowly over time, the frequency of irrigation is less dependent on soil characteristics (i.e. how fast it is absorbed). Water distribution can also be closely tailored to the needs of each individual plant. For more information on drip irrigation, feel free to contact us.

The following are some general tips to help you get started:

- ◆ Like other types of sprinkling systems, drip systems need upkeep too. It is therefore a good idea to occasionally turn your drip system on when you can take some time to inspect it.
- ◆ Drip irrigation systems are designed to operate with lower pressure than regular sprinklers and therefore pressure reducers are recommended to be installed with them. The recommended operating pressure for drip systems is generally 20 to 30 PSI. If emitters are being blown off your drip lines, it likely suggests excessive pressure. If you do not have a pressure reducer on your drip zone, you may want to consider adding one.

- ◆ It is generally recommended that drip systems be equipped with filters. It is a good idea to clean these out occasionally. You may want to consider adding a drip-system filter if you experience emitter clogging or related problems.
- ◆ There are pre-assembled kits that combine appropriately sized valves for drip systems, a filter and a pressure regulator. These all-in-one kits may be worth considering as they address multiple issues in one installation. These can be found at local irrigation specialty stores.
- ◆ Emitters can become clogged, and should be replaced before the plant becomes stressed or dies. The moisture meter we gave you can aid in determining whether it is moist around your plants' roots. Look for evidence that emitters are working whenever you check the drip system.
- ◆ Drip emitters are most effective when located midway between the plant's trunk and the dripline (i.e., the outer limit of the plant's branches). Since the dripline expands as the plant grows, it is best to move and expand the emitter array every year or two.
- ◆ It is good practice to provide two or more small volume emitters per plant rather than a single large volume emitter. This will provide water more uniformly to the root area, and will assure that the plant still receives some water if an emitter malfunctions or clogs.
- ◆ If **all** plants on the drip system seem too dry, try adding a few minutes at a time to the drip zone schedule. However, if only *some* plants seem too dry, more emitters or micro-sprayers can be added to only the dry plants.
- ◆ Shrub areas watered by drip often only need to be watered a few days a week but with fairly long run times. If some of your drip zones also water flowers or vegetables, you will probably need to run them more frequently.

PLEASE NOTE: Though drip systems are low volume and require little pressure to operate, they can be over developed and result in an unsatisfactory water application due to inadequate water supply. Drip is user friendly and very easy to expand, but taking it beyond its limits can result in a less than desirable reduction in water application to areas of your landscape.

Other Considerations:

Lawn Alternatives:

Lawns tend to be high cost, high maintenance investments. They require mowing once or even twice weekly during the growing season, along with periodic applications of fertilizer and other garden chemicals to achieve the desired appearance. They also need sufficient, even, and regular watering. However, since traditional grasses also tend to have higher water and maintenance needs, and because they demand very precise water application, the best approach is to define your lawn needs, and limit grass to the most functional and appropriate locations, such as sunny areas close to the house and without too much slope. In other areas of your landscape, you may decide to replace some of your lawn with other alternatives over time.

- ✓ Narrow strips of lawn (less than eight feet wide) are especially difficult to irrigate efficiently, and they often serve little function. They also tend to have especially high maintenance demands (lots of edging, broken sprinklers along sidewalks, etc.). Converting these narrow grass strips to shrubs, groundcovers, or artificial turf may save money and water.
- ✓ Sloped areas are difficult to keep green without runoff, and are good candidates for conversion to plants that need less water.
- ✓ Replacing excess lawn areas with decks or patios can create pleasant, functional areas that require less work and less water.
- ✓ Replacing portions of front lawns with shrubs or ground covers can add interest and privacy, while lowering maintenance and water use.

NOTE: When replacing turf lawns with non-grass landscaping, check homeowner covenant landscape provisions to make sure your property is not subject to specific landscaping requirements.

Traditional lawns certainly have their place. They can provide an excellent play surface, help cool the air near your house, and reduce erosion. However, landscapes usually include far more lawn than is functional, or lawns are placed where other choices might be more desirable or logical. Since grass tends to have high water needs and demands very even water application, over time you may wish to consider replacing some lawn areas with other options.

There are many attractive plants have particularly low water needs. Selecting these can result in aesthetically pleasing landscapes that may need minimal sprinkling. For low-water landscaping ideas, pictures, and tips, please visit our “**Water-Wise Gardening**” website at www.medford.watersmartgardening.com.

Keep in mind that when replacing lawn areas, some accompanying modifications to sprinkler systems or schedules may be necessary for water savings to be realized.

Soil Improvement:

Improving the soil by adding organic amendments is also recommended when replanting an area. Soils in this area are usually high in clay. Soil improvement is very important for water efficient landscaping. Clay absorbs water so slowly that the water will run off if applied too quickly. You should consider working in up to six cups per 1000 feet of organic soil amendments (such as compost) deeply into the soil before planting or lawn renovations. Unfortunately, it is a somewhat common landscaping practice to simply add a few inches of topsoil and plant without tilling soil amendments into the existing soil. This tends to hinder deep root development, which in turn may require you to water more often for short amounts of time and can make maintaining a healthy lawn more difficult. When planting new plants, or if at some point you decide to re-plant your lawn, it would be beneficial to add more soil amendments, especially organic material, and mix it in well with both the topsoil layer and some of the underlying soil.

Thatch:

Thatch is a build-up of slowly decomposing grass stems and roots that can occur over time. If a great deal of thatch accumulates, it can prevent water, air and nutrients from reaching the grass roots. Thatch removal with a special rake or de-thatching equipment may be beneficial. Once removed, thatch can be prevented by watering deeply and infrequently, using slow-release nitrogen fertilizers, aerating clay and/or compacted soils, switching to low thatch-producing grass varieties (Bluegrass, Ryegrass, and Tall Fescue) and mowing on a regular basis.

Aeration:

With the clay soils typical in our area and the tendency for soil compaction, we recommend that lawns be aerated yearly, generally in the spring or fall. It reduces soil compaction, increases air exchange and allows water to infiltrate more quickly into the soil profile.

Fertilizing:

While use of some fertilizer is generally considered to be beneficial, recognize that the more you fertilize, the more you will need to water and mow. You may wish to consider organic or slow release fertilizers, and limit how often you apply them. Fall and spring tend to be the recommended times to fertilize lawns.

Fertilization is also effective when done immediately following aeration. The aerated soil will absorb fertilizer directly into the root zone. You may also wish to consider top dressing with a light soil mixture such as compost after aeration. Raking this mixture in will help it filter into the aeration holes and should gradually improve your soil.

Mowing:

In our area, cool season turfgrasses are the dominant grass species used for lawns. "Cool season" refers to grass that stays green through winter but goes dormant (brown) in the summer without irrigation. These types of grasses should be mowed no shorter than two inches in the cooler months and three inches in the heat of summer. Keeping grass height above these levels will prevent excessive moisture loss from the soil and help promote a healthy, full lawn.

Mulching:

Mulch is any material spread over the soil surface to retain soil moisture, moderate soil temperature, and/or suppress weed growth. Generally, we recommend applying about three (3) inches of organic mulches in planting beds and on bare ground. Mulches can be either organic or inorganic.

- ✓ ***Organic mulches*** include things like compost, grass clippings, straw, aged animal manure, pine needles, leaves, bark, and wood chips. These materials can improve water absorption, add nutrients to the soil as they break down, insulate soil in winter, cool soil in summer, help prevent soil compaction, help prevent erosion, and suppress weed growth.
- ✓ ***Inorganic mulches*** include rocks, gravel, or sheeting. While these materials can suppress weeds and lessen erosion, inorganic mulches can also absorb and re-radiate

the sun's heat. This can actually **increase** the amount of water that surrounding plants need. In addition, plastic sheeting can act as a barrier to water and nutrient movement in the soil, causing further problems.

All organic mulch decomposes and shifts around, so replenishment from time to time is necessary. You might consider adding a few more inches of mulch in your planting beds. Adding mulch will help keep shrub and tree roots cool and moist, slowly amend your clay soils with organic material, and lower watering needs. When applying mulch, be sure to keep it a few inches from trunks of trees and shrubs.

Moss:

Moss loves shady, moist conditions, so exposing it to sun or allowing the area to dry out is most effective. Since taking down trees is often not a desirable solution, consider replacing these areas with shade tolerant grass blends or other shade-loving plants. Additionally, moss loves acidic soils. Adding lime will raise the pH of the soil.

When attempting any of the ideas presented, please monitor your landscape closely for any changes in plant health, occasionally check soil moisture levels with the meter we provided or other type of probe, and seek out a variety of expert opinions. If you have any further questions, please contact us at (541) 774-2436.