

Efficient Irrigation:

Once you've installed a Xeriscape, it's important to water it efficiently. Efficient irrigation is the planned management of water in the landscape to prevent waste and over use. In order to achieve this goal you must understand both the plant water requirements and the operating specifications of the irrigation equipment. BASIC PRINCIPLES Although irrigation systems can range from a new automatic system to a sprinkler attached to the end of a hose, there are some basic principles that will allow you to be more efficient with your water use.

The best time to water is during the morning or evening hours. Watering in the middle of the day when wind and evaporation rates are highest is not very efficient. Most of the water applied between 10 am and 6 pm barely reaches the plant due to evaporation and wind.

Keep water close to the ground. Avoid the oscillating type of sprinkler that sends water high into the air. Stationary sprinkler heads (spray heads) that keep the water fairly low or sprinklers that move horizontally from side to side (rotary heads) are less prone to evaporation and wind drift. Drip, micro-sprays, bubblers or emitters are the most efficient for watering flowers, shrubs and trees.

Design your sprinkler system or plan your hose placement so that a given zone or hose placement waters plants with similar watering requirements at the same time. For automatic sprinkler systems, never mix different irrigation methods on the same zone. All methods, fixed spray head, rotary head and drip emitters apply water at different rates. Trying to irrigate plants with different water requirements at the same time or mixing irrigation methods will result in either over-watering some plants or under-watering others.

Check your system regularly for leaks, broken or misaligned heads and make the repairs promptly.

Your irrigation schedule should be changed at least once a month to reflect seasonal changes in water requirements.

SCHEDULING Scheduling your irrigation run times can often be one of the most confusing things about watering your landscape. Fortunately, when boiled down to the basics it can be fairly easy. Plant water requirement can vary greatly depending on the choices you make in the design process. Using the information discussed in the **Select and Group Plants Accordingly** section will allow you to irrigate plants with similar watering needs more efficiently. Once you know the plant water requirements the operating specifications of the irrigation system will determine how long to water in order to meet the plants needs. Determine your irrigation schedule by establishing the irrigation application rate of each zone or hose end sprinkler. The application rate is how much water your sprinkler system applies to your landscape in a given amount of time. Application rates are usually defined as inches per hour (in/hr). There are two ways to determine the application rate of your sprinklers. A rough estimate of your application rate can be found by determining your sprinkler type and consulting the manufacturers catalog or website. The preferred and most accurate way is to perform a "catch can test". To perform this test simply place three or more identically sized empty cans at various distances from the sprinklers within a given zone, preferably in a grid pattern. Turn the sprinkler zone on for 15 minutes, after turning off the sprinkler system determine the total amount of water collected and divide by the number of cans used. This will tell you how much water is being applied in 15 minutes. To convert to inches per hour simply

multiply times 4. Once you have completed this test you will know how long you need to run your sprinklers to meet the water requirements of your landscape. Example:

You have a sprinkler zone irrigating Kentucky bluegrass that you've determined has an application rate of 1.5 inches per hour. If you live in the front range, in late July, Kentucky bluegrass requires approximately 1.5 inches of water per week. If you do not live in the front range area, check with your local county extension office, they will have information as to the amount of water Kentucky bluegrass requires.

Divide the plant water requirement by the sprinkler application rate and multiply by 60 minutes to determine the number of minutes per week you need to run your sprinkler system to meet the plant requirement.

$$1.5 \text{ in/hr} \div 1.5 \text{ in/week} = 1 \text{ hr/week} \times 60 \text{ minutes} = 60 \text{ minutes per week}$$

In this example you would want to run this particular sprinkler zone for 60 minutes per week to meet the plant water requirement of 1.5 inches per week. Other factors to be considered when scheduling irrigation run times are distribution uniformity and soil type.

Distribution uniformity is a measurement of how evenly your sprinkler system applies water across the entire zone. Distribution uniformity is measured as a percentage with 65% expected for spray sprinklers and 70% expected for rotary sprinklers. Sprinkler systems with high uniformity have to apply less water to meet plant water requirements. Sprinkler systems with low uniformity have to apply more water to compensate for areas where water is not being applied uniformly. Increasing distribution uniformity will allow you to apply less water and irrigate your landscape more efficiently.

Soil types are important in irrigation scheduling because not all soil types accept water at the same rate. Clay soils can typically accept water at rates less than .25 inches per hour, whereas sandy soils can accept water at rates over 1 inch per hour. Knowing your soil type allows you to schedule your irrigation so that runoff is less likely to occur. With clay soils you will have to employ a technique called **cycle and soak** to avoid runoff. If you water for 20 minutes and runoff occurs after 10 minutes, you should schedule your irrigation to run for 10 minutes, wait at least one hour for the water to soak in and then schedule the irrigation system to water the last 10 minutes. The easiest way to determine when runoff will occur is to run your irrigation system and time how long it takes before water begins to runoff. Make note of this so that you can schedule your irrigation accordingly. Read the **Improve the Soil** section to learn about the benefits of soil amendments.

NEW TECHNOLOGY There are many new technologies available to help you manage the amount of water you apply to your landscape. Increased Uniformity **Sub-Surface Drip Irrigation** – Ideal for narrow strips of turf (less than 10 feet wide) and dense planting beds. Irrigation water is applied where it is needed, at the root zone.

www.netafim.com
www.rainbird.com

High-Uniformity Nozzles – Several manufacturers sell nozzles designed to increase the uniform application of water by sprinkler heads. Nozzles with multiple rotating streams, called rotary nozzles, have proven to increase uniformity.

www.hunterindustries.com
www.rainbird.com

SchedulingET (Evapotranspiration) Controllers – These controllers monitor the local weather and adjust your irrigation run times accordingly. They receive their information via either satellite paging or from an on-site weather sensor. The initial set-up of these controllers can be complicated as you need to know information such as plant type, soil type, application rate, slopes and more. Most controllers feature default values to help the average homeowner. These controllers should be used in conjunction with an efficient irrigation system meeting minimum Distribution Uniformity standards.

www.hunterindustries.com
www.weathertrak.comwww.smartline.comwww.irritrol.com
www.toro.com

Soil Moisture Sensors – These devices measure the amount of moisture in the soil and adjust your irrigation run times accordingly. They are typically an add-on device to your existing irrigation controller. The moisture in the soil around your plant material can often be an accurate measurement of the need for irrigation. Again, these devices should be used in conjunction with an efficient irrigation system.

www.baselinesystems.com
www.irrometer.com

Rain Sensors – This is a device that automatically shuts down the irrigation controller when a specified amount of rain has been measured. When the sensor has dried out, the irrigation controller will automatically resume at the next scheduled start-time. Landscape plants can and do benefit from seasonal rainfall. By stopping or preventing the irrigation controller to run when it has rained, thousands of gallons of water can be saved. These are a great add-on that are fairly inexpensive.

www.hunterindustries.com
www.rainbird.com
www.toro.com

An excellent website for further information on turf irrigation management is
<http://www.westernslopeturf.org>.