Las Campanas Water Coorperative

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Drip Irrigation for Efficient Watering

Saving water in the landscape will become increasingly important as we move into a hotter and potentially drier future.

When properly designed, utilized, and maintained, a drip irrigation system is the most efficient way to water most plants in our gardens. Drip systems apply water directly to the soil in discrete spots in the landscape, versus sprinklers that are designed to throw water out over larger areas.

Water is applied through emitters, which have openings of various sizes to determine how much water each emitter will apply for a given time span. Common emitter sizes are 1/2, 1, 2, and 4 gph (gallons per hour). The number and sizes of emitters used determine how much water is applied to each plant.

The area of coverage for each emitter (how far the water will spread out) is determined by the soil make-up; water goes down in a narrower column in a sandy soil than it does in a clay soil. It also goes down faster through a sandy soil than it does through a clay soil. How closely emitters are spaced and how long the system is run each time should be correlated to the soil texture and the way water moves through the soil, as well as to the types and sizes of the plants.

Drip systems are controlled by valves that open to allow water to flow through; these valves are often referred to as zones. When the valves are opened and for how long are variables controlled by a timer. Plants that need the same frequency of irrigation when they are established should be watered by the same zone, whenever possible. For example, most of the trees we use, plus drought tolerant native and adapted shrubs, need to be watered less frequently than most of the perennials and non-native shrubs (such as roses) that we use; thus, trees and drought tolerant shrubs should be irrigated on the same zone. Many of the non-native shrubs and perennials we use need to be watered more frequently and can be grouped in the same zone. The numbers and sizes of emitters used insure that each plant gets the right amount of water each time that zone is run. Grouping plants that need irrigation at different frequencies on the same zone usually means some will be overwatered or some will be underwatered. A landscape that includes plants with a variety of irrigation needs should have different zones tailored to those needs.

The combination of numbers and sizes of emitters, plus the length of time the valve is open, determine how much water is applied to that zone at each irrigation.

It is very important to expand coverage of drip systems as plants grow, as root systems spread further out.

For example, a zone with 100 emitters rated at 2 gph will use 200 gallons of water in an hour. Typical designs are more complex than this; Eye on Water can be used to check actual output after a zone has been run.

The main lines that bring water to each zone along with the small tubing that takes water to each emitter should be covered with an inch or so of mulch or soil; exposure to sunlight can degrade the plastic these are made of. Emitters can be left just above ground or under the mulch, as long as they are placed correctly in regard to the root system. If drip lines are buried too deep it may be impossible to detect leaks until a lot of water has been lost.

It is very important to expand coverage of drip systems as plants grow, as root systems spread further out. Emitters placed at the base of a new plant will not water the expanding root system adequately after a couple of years. Expanding the irrigation once will work for many perennials, while irrigation may need to be expanded twice for shrubs and possibly more than that for trees.

Irrigation frequency should be keyed to the changes in seasonal conditions. A system that waters every three days in the hottest part of summer might only need to be run every 5-7 days in the spring (April/May) and in the fall (September/October). A system that is keyed to watering plants during the hottest summer days is likely overwatering plants in the spring and fall. Daily weather variables also affect the frequency of irrigation needed. Knowing how to turn the system off for a while after a heavy rain, as well as how to program it to match seasonal needs, keeps water use more efficient.

A variation on the typical drip set-up is the use of micro-sprinklers, small plastic sprinkler heads that throw out a fine mist. These are very inefficient and not recommended for most applications. For large areas of groundcovers or densely planted beds, drip lines with emitters included inside the hose (in-line emitters) at intervals of 6" or 12" can water all the plants in that area more efficiently.

Since typical drip systems don't throw water up in the air, it doesn't matter what time of day they are run. Some people like to run the system in early morning so they can see if there are any leaks or abnormally wet areas before the heat evaporates the surface water. The potential for leaks also makes it important to know how to turn the system off as soon as they are detected.

Matching a drip irrigation system to the characteristics of the site, the plants being irrigated, and the seasonal weather conditions is the most efficient way to water your garden and insure that all your plants remain healthy.