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## Drip Irrigation Tune-up

Drip irrigation is an excellent way to deliver appropriate quantities of water to landscape plants. However, drip systems may develop problems a few years after installation. Mineral deposits can start to limit the system's performance, routine maintenance can disrupt lines, and when trees and shrubs have outgrown their original drip emitters. Often, the first sign of drip irrigation failure is a dying plant or a small geyser. Giving your drip system a tune up will likely improve your irrigation efficiency, conserve water in your landscape, and maintain healthier plants.

A plant is considered "irrigated" when an adequate amount of water is supplied to its root systems. Roots do not seek water. Roots develop where there is soil and periodic water. Deep, less frequent watering encourages deeper roots and more robust plants. Even so, rooting depth has limitations because roots also need oxygen and the deeper you go, the more difficult it becomes for oxygen to diffuse into the soil.

Drip irrigation has several advantages: less evaporation and run-off because water soaks directly into the soil; less stress on plants because soil moisture is replenished periodically; and reduced weed growth because water is only applied where plants are growing. Of course, this assumes proper system design, installation, maintenance, and that someone is periodically checking the system to ensure it is performing as it should.

To begin giving your drip system a tune up, check to see if you have a filter. If so, disassemble, clean and reassemble the filter. Then remove the end cap(s) and turn on the valve allowing the water to flush out dirt and debris in the main line being careful to prevent soil and debris from entering the open end. Turn off the valve, remove emitters (simply pull them off), replace the end cap and flush the lateral lines for another two or three minutes. While the system is running, replace emitters, and observe for problems. This procedure should also be followed anytime repairs are made to the system.

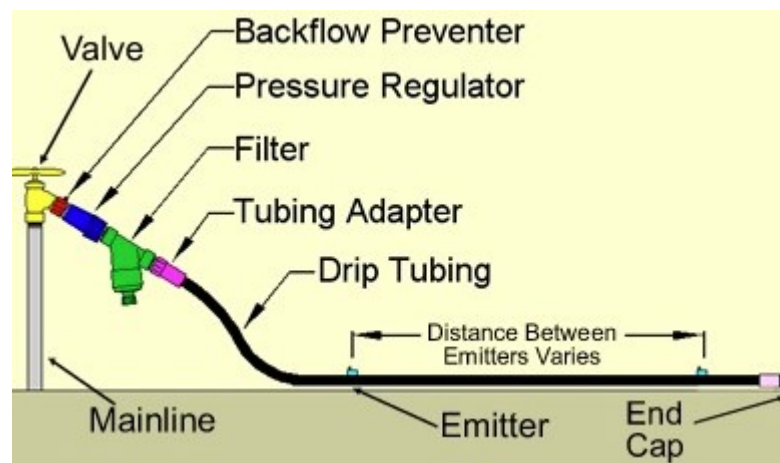
Drip irrigation systems should also have a pressure regulator that reduces incoming water pressure for low-pressure drip systems. Typical household water pressure is 50 to 60 psi while drip systems are designed to operate at around 20 to 30 psi depending on the manufacturer. A typical drip system has the pressure regulator installed just after the filter.

During the growing season, periodically check, clean, and/or replace emitters to ensure proper operation. Check for emitters that have popped off tubing because of high pressure, and install or replace the pressure regulator if needed. Check to see that all emitters are in place. Salt/mineral deposits and be removed from emitters by soaking them in vinegar and/or using forced air to blow them out. New emitters are also relatively inexpensive.

Look for pinched or broken tubing and straighten or replace it. Missing and broken emitters will need to be replaced. Drip irrigation emitters are sold with either fixed or adjustable output. The output is measured in gallons per hour (GPH). Emitter output can be checked by placing the emitter in a container and measuring the volume after a fixed time interval. For example, if you collected 20 ounces of water over five minutes, this emitter's output would be about 2 gallons per hour (actually 1.88 GPH). 20 ounces divided by 128 converts it to gallons. Multiply the gallons times 12 to convert 5 minutes to calculate GPH.

It is also a good idea to assess whether or not the drip system is adequately providing water to larger plants. Large shrubs and trees are almost always planted with one or two drip emitters placed near the base of the plant. Many sources recommend that emitters be moved outward as these plants grow. I recommend that emitters be added rather than moved. When emitters are simply moved, the roots that were established in the original placement may not get adequate irrigation while you are waiting for new roots to grow toward the new emitter location. Drip irrigation can be problematic for these larger plants unless plans are in place to expand the area irrigated over the life of the plant. Multiport drip irrigation heads can accomplish this very well.

Next, you should critically assess whether or not a particular plant still needs irrigation. Native and drought-adapted plants are often established after two years of irrigation and may perform adequately without supplemental irrigation. Cacti and succulents are especially drought tolerant. When emitters are removed, install plugs designed especially for this purpose.



Simple schematic of a drip irrigation system.

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