

Drip Irrigation Basics

With drought increasingly a constant factor, and water bills out of sight, homeowners are focusing on water use like never before. We needn't turn off the taps completely and go without gardens, but by planting low-water plants and then watering efficiently, we can both comply with the municipal requests to reduce water use and lower those bills!

Efficient watering means putting the right amount of water, in the right place, just where the plants need it, without excess, runoff, overspray, or waste. The most efficient watering method available is drip irrigation--drip irrigation exceeds 90 percent efficiency, whereas sprinkler systems and hand watering are 50 to 70 percent efficient. For most home gardeners, the advantages of drip irrigation outweigh the disadvantages. The primary advantages are:

- Lower water use
- Less water waste
- Ease of watering

The two primary disadvantages are the necessity of routine maintenance, and the need to know and monitor your garden—since by and large you can't see drip at work, you have to pay attention to your plants, as well as visually monitor the system.

Drip irrigation works by placing water slowly and directly into the soil—literally “dripping” it in from the many small water emitters, which are placed one or more at each plant. Drip is also excellent for watering sloped gardens because the slow rate of water applied through drip irrigation means it is more likely to soak in before it runs off.

Whether you currently hand water, use hose-end sprinklers, have an in-ground sprinkler system, or are putting in new landscape, there is a drip system for you. Some are very, very basic, and still require turning the water on by hand, on a schedule that keeps your garden properly irrigated, and others are more complex systems, with electric valves and electronic controllers—but you get to choose.

Basic Elements



Basic drip systems consist either of individual water emitters connected by ¼” feeder tubing to 5/8” polyethylene main line tubing, or 5/8” tubing with emitters ‘built in’ at measured intervals. Either system is in turn connected to a water source. This can be a hose bib, a manual valve, or an electric valve controlled by an irrigation controller. Emitters are small plastic parts that ‘emit’ controlled amounts of water. They can be drippers, or micro-sprayers, or micro-bubblers, or lengths of emitter line which have water drippers every few inches. They are normally calibrated in gallons per hour, or gph, and standard sizes come in ½ gph, 1 gph, 2 gph, and more.

Installation of a basic, simple drip system is quite straightforward, and easily within the grasp of most home gardeners. It goes together much like a tubular erector set--all snapping together. Main 5/8 inch lines slip into fittings on the water source (if you're on well water, you need a filter on the water source). If you are using 1/4" feeder tubes, these slip onto barbed fittings that poke into the main lines; "tee" and "el" fittings allow feeder branches to go to individual plants; continuous emitter lines snap/poke in like feeder tube then snake through areas of denser planting. The 5/8" in-line emitter tubing works similarly; you snake it through your beds or construct circles around shrubs and trees that you then connect with regular main lines.

If you already have an above-ground pressurized system, it is very simple, with a couple of plastic parts, to convert it to a drip system. So if you're thinking of reducing some of your lawn, for example, and you already have a system that automatically waters, you've got the controller and underground piping for a drip system!

Advice from representatives at outlets that sell drip equipment, can assist you, and make a DIY job feasible. Also, an excellent primer is *Drip Irrigation in the Home Landscape*, available from the University of California Agriculture and Natural Resources (Publication 21579-<http://anrcatalog.ucdavis.edu/>). An excellent book on drip is *Drip Irrigation for Every Landscape*, by Robert Kourik.



Emitter Line

Water Zones

Whether you install a simple, hand-activated system, or a more complex automatic system, one key element of drip irrigation design is zoning—sometimes called hydrozoning. What this basically means is dividing the irrigation system into areas, zones and putting plants with similar water needs on their own zones. For example, you might have all pots on a sunny deck, which need water daily, or perhaps twice, on one zone. Shrubs that need weekly, or twice weekly watering would go on another zone. Trees which need less frequent, but longer watering on yet another. Sunny and shady areas might go on different zones.

Dealing with the disadvantages—Maintenance and Monitoring

You should visually monitor the system regularly. If you don't, you won't know that the system is not working until plants die or show severe water stress. Lines break, tube pulls away from fittings, shovels make unknown cuts, emitters plug. Look and listen for geysers, spouts, leaks, large wet areas, etc. Also monitor the health of your plants for signs of too little or too much water. You should of course do this anyway. Check the soil periodically for correct moisture.

You also need to learn basic repairs and keep a toolbox of useful repair parts and tools: wire cutting pliers, regular pliers, hole punch, sturdy scissors, various connectors, sprayer heads, emitters, bubblers, emitter tubing, goof plugs, etc. But don't be concerned if you are not mechanically minded – this stuff really is pretty easy to understand.



Over time, you will need to adjust your system, to reduce water to some plants, and increase it to others. Gardens are constantly changing: plants die and must be replaced; new sections are added; plants grow, and need more water, and drip irrigation systems have changed as well, in order to maintain maximum efficiency in the use of water.

While involving some time, effort and cost, a properly designed and installed drip irrigation system will both save considerable water and money, and make the job of watering the garden easier.

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