



STARNOTE 905  
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# UNDERSTANDING DRIP SYSTEMS

*Save Money, Water and have healthy Plants*

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"Drip Irrigation" is a phrase heard often in these days of sensitivity to our water supply. For many people it has the ominous sound of one more overly-complicated home improvement project. Using drip irrigation not only saves water but is healthier for plants, and easy to install in a new yard or convert from an existing sprinkler system. What Is Drip Irrigation? The fundamental difference between drip irrigation and traditional home irrigation is conceptual, and the hardware it uses reflects this approach.

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### TRADITIONAL IRRIGATION SYSTEMS

In traditional irrigation, relatively large pipes (1/2" to 1") are used to convey water under pressure to heads of various types, which then sprinkle or bubble as required. In drip irrigation, much smaller tubing delivers smaller amounts of water at a controlled rate directly to the root zone of the plants being irrigated. The difference could be compared to using a laser rather than a kitchen knife when performing surgery.

In most cases, drip technology can be used in an existing landscape to water trees, shrubs, flower beds, vegetables and container plants without requiring extensive system overhauls.

### DRIP SYSTEMS WATERING RATE

Drip systems water at a slow rate and should be scheduled to run infrequently for longer periods of time (sometimes as little as twice a month, depending on the type of landscape and its maturity). Drip is rated in GPH (gallons per hour), as opposed to the GPM (gallons per minute) of traditional sprinkler heads. The basic cycle of drip irrigation is the alternation between soil saturation and a "resting" period when the oxygen necessary for good root growth can infiltrate the soil. Running a drip system every day not only defeats the purpose of the system, but may eventually result in the death of plants from oxygen deprivation and soil salinization.

**Different soil types** absorb water at different rates. Heavy clay soils, so common in the southwest, are slow to absorb water, but are also slow to give it up. Care is required

when choosing the frequency of watering in these soils, so that sufficient time for oxygen renewal is allowed. Sandy soils, such as those found throughout our area, are much quicker to both accept and give up water. These soils must be watered longer and more often. The water needs of your chosen plants also factor in system design, so it's important to know both the type of soil you will be irrigating and the watering requirements of the plant material. [\(top\)](#)

**When choosing emitters** for plants in clay soil, pick lower rated ones ( ½ GPH to 1 GPH) that will allow for long, slow soaking. If you have sandier soil, choose emitters that are rated at 2 GPH. Unlike the "scattershot" effect of traditional systems, drip directly waters the root zone of your trees, shrubs and planting beds. It is very important to place emitters in proper locations around the plant. **A single emitter set to water a tree will eventually result in a weak tree with a lopsided root system, and may ultimately lead to the plant's death.** Even watering is needed around the entire tree. [\(top\)](#)

### **CONVERTING YOUR SYSTEM TO DRIP**

Converting a traditional irrigation system to drip requires a little investigative work in your yard. If you are lucky, you will have a properly divided set of valves controlling the various zones of your yard, with planting beds and shrubs on a different circuit than your lawn. If you are unsure about this, talk to a Star Nursery irrigation associate who will help you decide what to do. You will probably want to convert all valves, except those controlling your lawn, to drip irrigation. [\(top\)](#)

**Converting: Option # 1.** The quickest way is to build your drip system from your existing rigid-pipe (PVC) system. This has the advantage of being cheaper, easier, and longer lasting than flexible tubing, but can only be used easily if your existing system was properly constructed and installed.

To convert, simply remove existing sprinkler heads or shrub adapter heads in your planted area and install drip adapters on the risers. These will allow you to run ¼" flexible distribution tubing to the targeted area. Multi-port drip bubblers easily adapt to your existing sprinkler system and have built-in pressure regulation and filtration, which removes the need to place special controllers in-line. These products come in 2,6,10 or 20 GPH, or have adjustable flow rates. Choose the flow rates that work best for you. There is no need to attach separate emitters to the end of the distribution tubes. You can run tubing from individual ports as far as 15 feet with negligible loss in performance. The main advantages of this system are ease of installation, use of existing pipes and long life. [\(top\)](#)

**Converting: Option # 2.** The other significant conversion option is the flexible pipe system. This is what most people think of when they hear about drip irrigation. This method is based on ½" flexible tubing drawing directly off water supply pipes. It should also include an in-line pressure regulator and water filter. Don't mix tubing types! There are size differences ranging from .620 to .710. All ½" fittings don't fit all kinds of ½" tubing. Match all the parts before you begin work. Distribution tubing (1/4") with separate emitters can be connected directly to the ½" flex line. This system is highly adaptable and more suitable because of flexibility. It's also easier to change if you need to expand or contract the system.

Since no glue is used, a pressure regulator is needed to prevent the compression fittings from separating under normal water pressure. Filters take out most of the mineral debris that can clog the tiny openings of drip emitters. Once you have installed these items at the valve manifold, the connection point to your main water supply, it's very simple to run your ½" tubing. You can bury the line or leave it exposed. Burying prolongs the life of your system but can also make maintenance and diagnosis of problems more difficult. [\(top\)](#)

Once the ½" tubing has been run to the general irrigation areas, you are ready to add the ¼" distribution tubing and drip emitters. On trees, for example, make a "J" loop around the drip line of the tree and install your emitters. As the tree grows, you can expand the watering area by adding more ¼" lines. To better understand how many emitters you can attach on a ¼" line, and the associated pressure losses, please read Star Tip # 1022 "Maximum Dripper Line Runs".

To install ¼" tubing connectors in your main ½" flex line, use a special hole punch tool which makes exactly the right size hole. Never use a knife or pruning shears to make the hole or you will probably have leaks in the system. If you make a mistake, a dual-purpose goof plug is available which allows you to correct errors in both ½" and ¼" tubing. This plug also allows you to close old holes when you move distribution lines. There are also convenient ½" and ¼" compression fittings which make tee or 90° connections. Once again, make sure the fittings match your tubing! [\(top\)](#)

**NEW TECHNOLOGIES:** Only the most basic systems have been described. Recent advances allow nearly unlimited customizing options. There are micro-sprinklers for flower beds and containers. Mist heads and ¼" soaker tubing are also available. Laser drip tubing and Dripperlines offer excellent water distribution alternatives. There is really no limitation to a properly designed drip system. With regular maintenance and reasonable care, a system can last for many years while saving money and water, and preserving your landscape.

If you have questions or encounter problems, visit your favorite Star Nursery location for the right answers. Converting to drip is an easy, cost-saving, do-it-yourself project. Once you've converted, you'll urge others to do the same!  
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