

# Drip Irrigation for Home Landscapes

City of Olympia, Public Works

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## Grow Healthier Plants with Half the Water and Less Work than Sprinklers

**How does it work?** Drip irrigation emitters deliver water directly to the soil, with no water wasted through evaporation or application to unintended areas. Benefits of drip irrigation include:



- Water only where needed, not on unplanted areas.
- Fewer sprouting weeds.
- Reduced plant diseases spread by splashing soil and wet foliage.
- No dead plants from sprinklers blocked by other plants.
- Less work moving hoses and sprinklers!

**It's easy to install and use drip irrigation.** The parts fit together using common tools, and can be hooked up to a hose spigot or existing sprinkler system. Drip can be placed above ground, and a few zones can water a larger area.

It's simple to lay soaker hoses on a small garden bed, although planning a drip system for a large garden may require the assistance of an irrigation contractor.

## How to Create an Efficient Drip Irrigation System

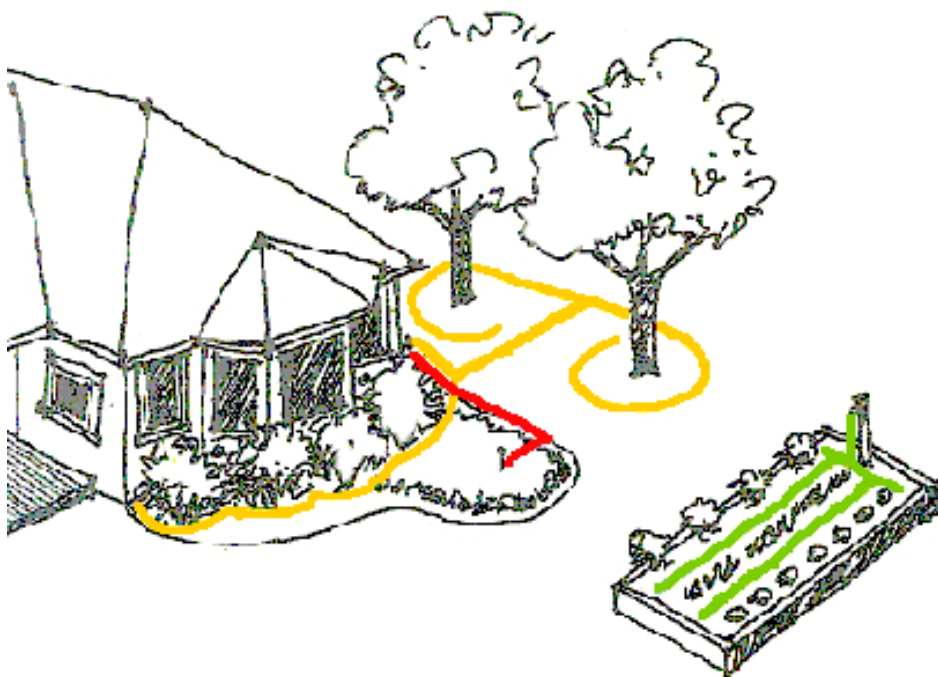
The best drip irrigation system for your garden depends on the size and layout. Drip irrigation and soaker hose catalogs (available from garden centers or mail order suppliers) can help you select the parts you need (see resource listings on page 4).

The following steps can help you learn what's right for your garden:

1. *Draw a map of the garden areas you plan to water.* A drawing makes it easy to lay out tubing and count the number of parts needed to put it together.

Use a tape measure to determine the length and width of planting areas, then sketch them on graph paper for easy scaling.

Let each inch on paper equal 4 or 8 feet for easy reading. Show the size of planting beds, and the location of large plants and water faucets. Note where lines need to go under or around paving.

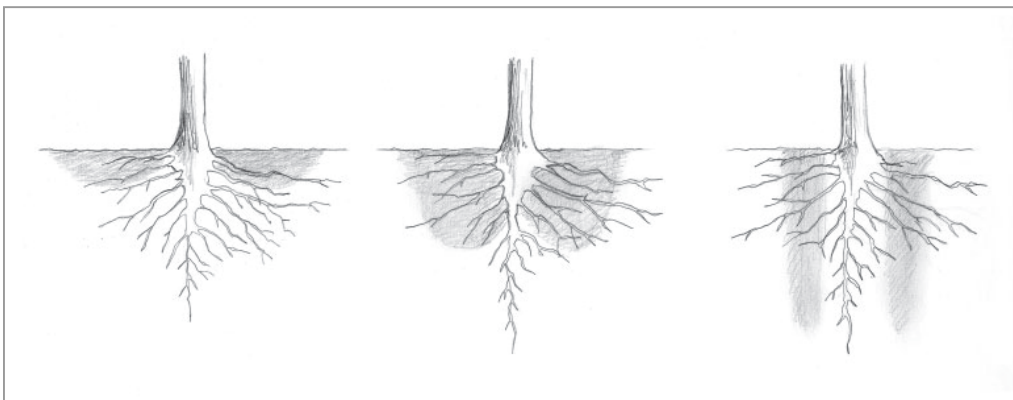


2. *Choose the irrigation type appropriate for each planting area.* Drip systems can include emitters placed at each plant, soaker lines that create a band of moist soil, and small sprays. Use the chart below to help select the best device for each garden area based on plant needs and your budget (see Table 1).

TABLE 1.

Drip Irrigation Types and Uses	Benefits	Limits
Soaker hoses “sweat” moisture along their entire length.	<ul style="list-style-type: none"> <li>• Good for small areas on level ground and temporary watering of transplants.</li> <li>• Easy to connect to garden hoses.</li> <li>• Inexpensive and reusable.</li> </ul>	<ul style="list-style-type: none"> <li>• Uneven watering on slopes or large areas.</li> <li>• Hoses limited to 100 feet per connection.</li> <li>• Water wasted on unplanted areas.</li> <li>• Clog or break in 2-4 years.</li> </ul>
Drip emitters inserted in plastic tubing at each plant to apply water only where needed.	<ul style="list-style-type: none"> <li>• Efficient way to water many plants spread over a large area.</li> <li>• Uniform watering, with proper number of emitters per plant.</li> <li>• No waste in unplanted areas.</li> <li>• Tubing lasts 10-20 years.</li> </ul>	<ul style="list-style-type: none"> <li>• Some types easily damaged.</li> <li>• May need to add emitters as plants grow.</li> </ul>
Drip lines with emitters pre-installed inside plastic tubing (usually 12” apart) create a band of moist soil.	<ul style="list-style-type: none"> <li>• Uniform watering for large dense plantings, even on slopes.</li> <li>• Simple to install.</li> <li>• Emitters cannot be broken off.</li> <li>• Tubing lasts 10-20 years.</li> </ul>	
Drip tapes have regularly spaced emitters molded into thin plastic tubing; mostly used for agriculture.	<ul style="list-style-type: none"> <li>• Inexpensive for annual gardens or temporary (1-2 year) watering of new landscape plantings.</li> <li>• Easy to install and move.</li> </ul>	<ul style="list-style-type: none"> <li>• Can only run in straight lines.</li> <li>• Tubing easily damaged.</li> <li>• Clog or break in 2-4 years.</li> </ul>
Micro-sprays can be plugged into plastic tubing wherever needed to sprinkle small areas.	<ul style="list-style-type: none"> <li>• Good for spot watering transplants amid older plantings, or thirsty plants amid drought-tolerant plantings.</li> <li>• Easy to install and move.</li> <li>• Adjustable sprays match varied needs.</li> </ul>	<ul style="list-style-type: none"> <li>• Watering rate varies.</li> <li>• Spray can blow away.</li> <li>• Easily knocked over.</li> </ul>

3. *Sketch a layout showing where your drip tubing will be placed in each bed.* Spacing of soaker hoses or drip emitters depends on the soil, plant types, and spacing. Water spreads just 6 inches from a soaker hose or drip emitter in sandy soil, but a foot or more in clay (see diagram below). It is good to wet at least 50% of the root area of each perennial or shrub. Table 2 shows optimal spacing for drip and soaker hoses in various situations.



*Note: Water spread from drip or soaker hose in clay (far left), loam (middle), and sandy (right) soils.*

*Emitters or soaker hoses should be spaced closer on sandy soils than on clay.*

TABLE 2.

Plant Type	Space Between Drip Lines or Soaker Hoses		OR Number of Emitters Per Plant	
	<i>Clay Soil</i>	<i>Sandy Soil</i>	<i>Clay Soil</i>	<i>Sandy Soil</i>
	Emitters 15-18" apart in line	Emitters 6-12" apart in line		
Shrubs and Trees	3-4' between lines or hoses	2' between lines or hoses	One emitter/2' plant circumference	One emitter/1' plant circumference
Annuals	One soaker or emitter line per row of plants		One per plant	One per plant
Perennials	One soaker or emitter line per row of plants		One per plant	One or two per plant

4. *Decide how many "zones" are needed, and how to control them.* Plants with similar water needs and sun/shade conditions should be grouped into zones controlled by the same valve or timer zone. Annuals need more water than perennials or shrubs, while most trees and large shrubs rarely need to be irrigated after the first few years in the garden. Plants in full sun may need twice as much water as similar plants in shade.

Zones also must be sized based on the water flow available. To check the flow available at your water source, run a fully open garden spigot or zone valve into a 5-gallon bucket for 30 seconds. Multiply the number of gallons by 120 to determine the hourly flow and how many emitters (rated in gallons per hour) can be run on a single valve.

5. *Make a list of the parts and tubing needed to construct your system.* Complete your sketch of tubing and emitter layout, adding parts needed at each connection to the water source (see the "What Every System Needs" section on page 4). Include extra connectors, couplers, plugs, emitters, and end fittings for quick repairs and additions.

### How Long Should I Soak or Drip?

*Each drip or soaker system is unique and its schedule should be, too.* Watering schedules depend on the weather, plants, soil, and emitter or soaker hose flow and spacing. Table 3 below suggests watering times for various situations, but the best advice is to observe plants and soil moisture before and after watering.

TABLE 3.

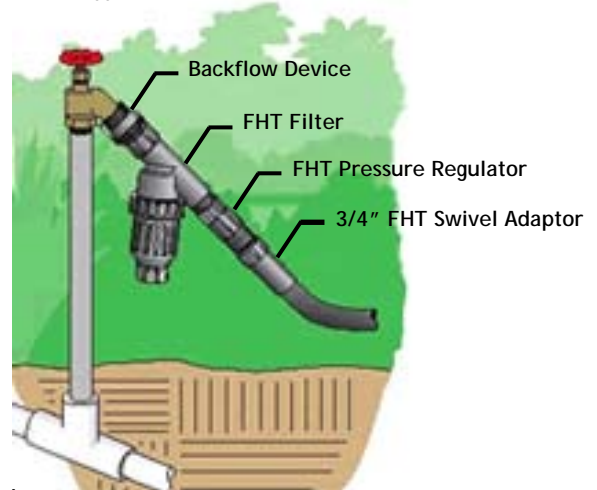
Plant Type	Layout on Loam Soil	Water Need	Weekly Run Time
Shrub and Tree Bed	One gallon/hour emitter per foot on lines 3' apart; or soaker hoses 3' apart	1/3 to 2/3" per week	One hour (once or split over 2 days)
Annuals and Perennials	One 1/2 gallon/hour emitter per foot of row	3/4 to 1" per week	One and a half hours (split over 2-3 days)
	One soaker hose per row	3/4 to 1" per week	45-60 minutes (split over 2-3 days)

## What Every System Needs

Every drip and soaker system starts with a few basic parts to ensure efficient operation and longevity. These may include some or all of the following, depending on the situation:

1. **A backflow preventer** is required for every irrigation system and hose spigot to prevent contamination of drinking water. Inexpensive (\$5 to \$10) backflow devices work for a single irrigation zone or hose spigot. Multiple-zone systems need a brass check valve.
2. **A filter** is essential to remove debris that can clog drip emitters. Filters usually cost \$5 to \$25 depending on the landscape size and water quality.
3. **A pressure reducer** is needed for efficient operation of many irrigation devices. Most drip emitters need regulators to work properly and for fittings to hold together if pressure is over 50-70 psi. Soaker hoses and drip tapes need 10 psi regulators. Use a pressure gauge (\$5 at garden centers) to check pressure at garden spigots. Plastic reducers can regulate pressures under 100 psi. Higher pressures require more durable devices installed at the meter.

HEAD ASSEMBLY



### TIPS FOR DRIPS

- *Use high quality parts that resist clogging and damage.* Pressure compensating emitters apply water evenly throughout the garden and automatically flush out dirt.
- *Lay drip lines and soaker hoses under mulch-don't bury them in the soil.* They will be easy to find before digging. Lines buried in the soil are hard to find before digging, and damage can go unnoticed.
- *Lay out drip and soaker tubing in straight or gently curving lines that come near to each plant.* Don't run small diameter "spaghetti" tubing to reach plants, as they are easily disconnected or cut.

## Drip Irrigation Parts Catalogs and/or Planning Guides

Catalogs are available at home and garden centers; most have good information on designing and laying out systems. Mail order suppliers with quality parts and useful information include:

- Dripworks, 1-800-522-3747 or [www.dripworksusa.com](http://www.dripworksusa.com)
- The Urban Farmer, 1-800-753-3747 or [www.urbanfarmerstore.com](http://www.urbanfarmerstore.com)
- DIG, 1-800-322-9146 or at [www.digcorp.com](http://www.digcorp.com)

## Want More Information?

**Contact:** Linda Ayala, Water Conservation Program Assistant  
**Telephone:** (360) 753-8570 or (360) 753-8270 (TTY)  
**Email:** [publicworks@ci.olympia.wa.us](mailto:publicworks@ci.olympia.wa.us)

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