



DRIP IRRIGATION FOR HOME GARDENS AND LANDSCAPES

BILL SMILLIE, MASTER GARDENER

“Water wars! Water is one of THE key commodities in the coming years. There's less and less of it generally available (not that the ocean volumes are changing much) and it's becoming increasingly expensive. As a result, homeowners are focusing on water use like never before.

Without question, the best method of garden irrigation for most home garden and landscape situations is drip irrigation. Efficient watering means putting the right amount of water, in the right place, just at the plants needing it, without excess, runoff, overspray, or waste. The most efficient irrigation method available is drip. Drip irrigation exceeds 90 percent efficiency, whereas sprinkler systems and hand watering are 50 to 70 percent efficient. The advantages of drip irrigation greatly 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, or through in-line emitters in dripline. 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.”

From the UC Master Gardener Program of Sonoma website, an excellent reference:

http://sonomamg.ucanr.edu/Drip_Irrigation/

Availability	↔	On VMS > Documents/Presentations > INFO DOCS > Drip Irrigation for Home Gardens and Landscapes	
History	↔	Original: 2/8/18	Revised: month/year:

ATGB - Drip Irrigation for Home Gardens and Landscapes

PLANNING GUIDELINES

1. Start with a site map, simple drawings are adequate.
2. Define Growing Areas:

Public View	Orchard Plants
Foundation Plantings	Vineyard / Berries
Border Plantings	Roses or Cut Flowers
Vegetable Garden	Pots and Containers
3. Consider the Plant Water Requirements:

Low	Drought Resistant, Native Plants
Medium	Mediterranean, Temperate Plants
High	Edibles, Tropical Plants

WUCOLS <http://ucanr.edu/sites/WUCOLS/>
4. Create 'Watering Zones' - (All plants irrigated by one valve):
 - If possible, create zones based on L, M, H water needs.
 - Adjust for shady and sunny areas where practical.
 - Sketch piping layout ideas on tissue paper.
 - Locate emitters and calculate total flow rate.
 - Determine pipe length and confirm allowable flows.
 - Plan for future emitters if plants are young.
 - For big, complicated projects, get professional help.

INSTALLATION TIPS

1. Materials:
 - Compile a list of irrigation parts.
 - Shop around for products, price and help.
 - Be prepared to make multiple trips, save receipts.
2. Basic Tools:

Trenching Shovel	PE Cutter	Wrenches
Grading Rake	Hole Punch	Tape Measure
Wheel Barrow	PVC Cutter	
3. Installation Supplies:

Drip Tubing Staples	Goof Plugs
Teflon Thread Tape	PVC Pipe Primer
Masking Tape	PVC Solvent Glue
4. In the Field:
 - Warm working temperatures are best.
 - Start at the control assembly and work out.
 - Staple drip tubing in place as you go.
 - Flush lines before installing emitters.
 - Mulch to cover drip tubing and emitters.
 - Use a soil moisture meter to check wetted area.
 - Reotemp 36 Inch Moisture Meter
 - Lincoln 36-Inch Soil Moisture Meter #8003

Drip Irrigation Reference Data

A. CONVERSIONS - GPM and GPH

- Gallons per Minute (GPM) x 60 = Gallons per Hour (GPH)
- Gallons per Hour (GPH) / 60 = Gallons per Minute (GPM)

B. IRRIGATION CONTROL ASSEMBLIES

MANUAL PARTS LIST:	AUTOMATIC PARTS LIST:
Garden Hose Valve	3/4" Automatic Valve with
Anti-Syphon Valve	anti-syphon valve.
150 Mesh In-Line Filter	150 Mesh Wye Filter
25 PSI Regulator	25-30 PSI Regulator
▪ All fittings Hose Thread	▪ All fittings Pipe Thread
▪ Min. Flow 12 GPH	▪ Min. Flow 30 GPH
▪ Max. Flow 240 GPH	▪ Max. Flow 480 GPH
▪ Install anti-syphon valves 12" higher than emitters.	

C. IRRIGATION PIPE - FLOW RATES and PIPE LENGTHS

Pipe Size and Type	Length	Flow
	Feet	GPH
1/4" PE Tubing	75	6
	25	12
	12	18
1/2" (.700) PE Tubing	150	120
	100	180
	50	240
3/4" CL 200 PVC Pipe	300	240
	100	480

- 1/4" Soaker Hose - 1.3 GPH per Foot (Maximum 10 Ft.)

D. DRIP EMITTERS - GENERAL INFORMATION

Root Zone Soil Type	CLAY	LOAM	SAND
Emitter Flow Rate (GPH)	0.5	1.0	2.0
Wetted Diameter (Feet)	3 - 4	2 - 3	1 - 2
Approx. Wetted Area (SF)	9.6	4.9	1.8

E. BUTTON EMITTERS - QUANTITY BY PLANT SIZE GUIDE

Root Zone Soil Type	CLAY	LOAM	SAND
Emitter Flow Rate (GPH)	0.5	1.0	2.0
Plants 1 - 2 Ft.	1	1	1
Plants 3 - 4 Ft.	1-2	2-3	2-3
Plants 5 - 6 Ft.	2-3	3-4	4-5

F. INLINE EMITTERS - 1/4" DRIPLINE (0.7 GPH/Emitter)

Root Zone Soil Type	CLAY	LOAM	SAND
Emitter Spacing (Inches)	12	9	6
GPH per Linear Foot	0.7	0.9	1.4
Max. Line Length (Feet)	28	22	16

G. INLINE EMITTERS - 1/2" DRIPLINE

Root Zone Soil Type	CLAY	LOAM	SAND
Emitter Flow Rate (GPH)	0.4	0.6	1.0
GPH per Foot - 24" Spacing	0.2	0.3	0.5
GPH per Foot - 18" Spacing	0.3	0.4	0.7
GPH per Foot - 12" Spacing	0.4	0.6	1.0

- For complex grid layouts consult vendor or:

<https://www.hunterindustries.com/product-line/micro%20irrigation>