# Drip Irrigation Basics

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# Drip Irrigation Advantages
(Why use drip?)

- Water delivered to where you need it without a lot of waste.
- Slow delivery of water so a benefit with all soil types.
- Reduced weed growth due to less water where you don’t want it.
- Can water at any time of day or night when spray restrictions may be in effect.
- No blockage of spray due to larger plant material.
- In most cases, easy to assemble and repair with no glued parts.
- Used in all types of plant combinations or specialty situations (i.e. Vegetable gardens, raised beds, etc).

# Flow Rates, Drip vs. Spray

- It all depends on pipe size (flow) (see chart) and nozzles used.
- Spray head application rate varies:
  - 5000 series rotor at normal pressure can apply 3-5 gpm (1 head)
  - Fixed pop up can range from .25 to 3 gpm depending on the nozzle used.
- Drip on the other hand is in gallons per hour. Each emitter ranging from .5 to 10+ gallons per hour.
- A typical system using 1 gph emitters could run approx. 1,400 emitters  and have enough flow through a ¾ inch pipe.

| | | | Assume Gravity to Low Pressure. About 6f/s flow velocity, also suction side of pump | | Assume Average Pressure. (20-100PSI) About 12f/s flow velocity | | Assume "High Pressure" PEAK flow. About 18f/s flow velocity* | |
|---|---|---|---|---|---|---|---|---|
| Sch 40 Pipe Size | ID (range) | OD | **GPM** (with minimal pressure loss & noise) | **GPH** (with minimal pressure loss & noise) | **GPM** (with minimal pressure loss & noise) | **GPH** (with minimal pressure loss & noise) | **GPM** (with significant pressure loss & noise) | **GPH** (with significant pressure loss & noise) |
| 1/2" | .50-.60" | .85" | 7 gpm | 420 gph | 14 gpm | 840 gph | 21 gpm | 1,260 gph |
| 3/4" | .75-.85" | 1.06" | 11 gpm | 660 gph | 23 gpm | 1,410 gph | 36 gpm | 2,160 gph |
| 1" | 1.00-1.03" | 1.33" | 16 gpm | 960 gph | 37 gpm | 2,220 gph | 58 gpm | 3,510 gph |
| 1.25" | 1.25-1.36" | 1.67" | 25 gpm | 1,500 gph | 62 gpm | 3,750 gph | 100 gpm | 5,940 gph |
| 1.5" | 1.50-1.60" | 1.90" | 35 gpm | 2100 gph | 81 gpm | 4,830 gph | 126 gpm | 7,560 gph |
| 2" | 1.95-2.05" | 2.38" | 55 gpm | 3300 gph | 127 gpm | 7,650 gph | 200 gpm | 12,000 gph |

# Determining Flow Rate for Drip Zones

Bucket method to determine flow
From the source

# Drip Zone Set Up - Manifolds and Valves

# Sprinkler Valves

Standard Valve


Valve w/ pressure regulator/ filter

# Filtration- a necessity with secondary water


Filter


Pressure Reducer

For Drip a mesh/screen size of 150 is probably adequate. The higher the number the finer/higher the filtration.

# pressure regulator/reducer





# Hose end connections work also


You can even purchase battery operated valves for hose end applications

# The quick set up of a drip zone manifold

- https://www.youtube.com/watch?v=yG56_Tbyi5o

# Pipe types and terms

- PVC (schedule 40)
- Poly
  - ½ inch or ¾ inch.
  - Used for main lines or lateral lines.
  - Thickness varies depending on use (drip applications have thinner walled pipe)
- Lateral Line- line from valve assembly to delivery (heads or emitters)
- Main Line-  supplies water to valve assembly (always pressurized)

# Drip irrigation overview

- Drip irrigation allows water to flow slowly to the root systems of the plants.
- Very little water is wasted because of evaporation or wind.
- Helps with weed control.
- Easier to install or change.

# Drip irrigation types


# In-line drip

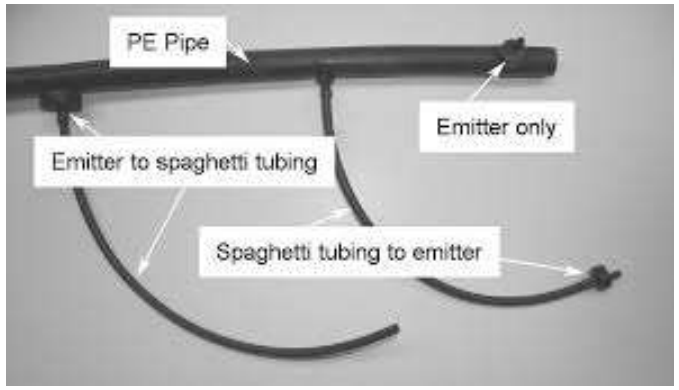
In-line drip is best for high density plantings.

# In-line emitter poly around shrub

# In-line drip emitters

- Drip emitters built directly into the lines
- This is meant to water the entire planter bed evenly
- Installed on the surface of the soil under a layer of mulch
- Maintenance of this style of drip line is easy

# Point-source drip




- Drip emitters are attached to the main line with distribution tubing
- Emitter is meant to water individual plants
- Installed on the surface of the soil under a layer of mulch
- This is the best approach for maximum weed control

# Point-source drip

Point-source drip works well for low-density but can be used on higher density plantings as well

# Drip irrigation retrofit kits

New technologies make switching from overhead spray to drip much easier.

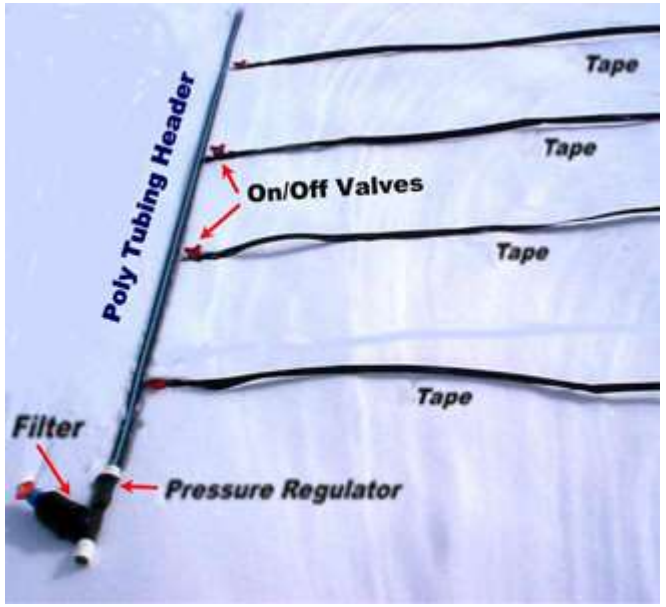
# Spray to Drip Conversion

# Drip Tape/ Trickle Tape/ T Tape



Drip tape used here in row crop applications, and dense plantings in raised beds

# Drip Tape Continued




- It operates at 8-15 PSI at the head-lines to give 10 PSI in the drip lines. (other drip may run at 35 PSI)
- Drip tubing can last anywhere from 1-5 years depending on the quality (8 mil- 15 mil) and the application and if left in the sun, etc.
- Drip Tape can be buried, covered with mulch or left at the surface level.
- Pressure compensating along the length, works very well.

# Resources:

- https://www.dripworks.com
- https://www.dripdepot.com
- https://www.rainbird.com/homeowners/drip-irrigation-basics
- https://www.orbitonline.com/products/drip-irrigation
- https://cwel.usu.edu/irrigation-extension