



# **Drip Irrigation: Spray to Drip**



**David Rice  
Weber Basin Water Conservancy District**

# Class



WEBER BASIN WATER  
**LEARNING  
GARDEN**

# Feedback



# Monthly Newsletter



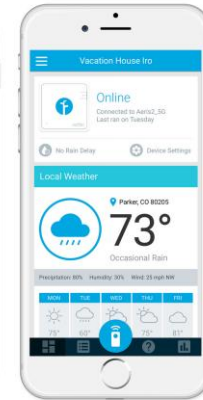
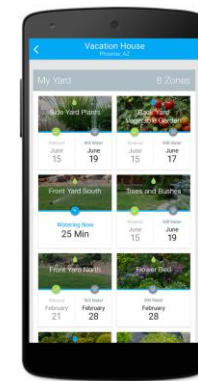
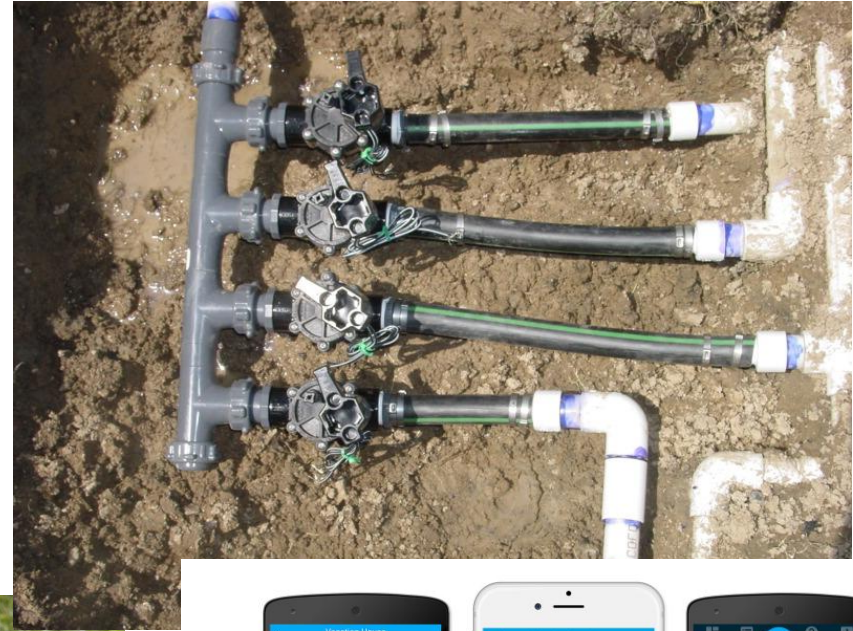


# Irrigation System and Product Improvements





# Irrigation System and Product Improvements





# Efficient watering is the goal

We want to give the plants the amount of water they actually need.





# Why Irrigate?

- When a plant can't get enough water from the environment
- Four irrigation situations
  - Temporary: after transplanting
  - Temporary: during drought
  - Permanent: Using plants not adapted to available moisture conditions
  - Permanent: in areas that have no natural water source (Pots and indoors)
- Irrigation systems
  - Sprinkler (spray) vs. drip/low volume





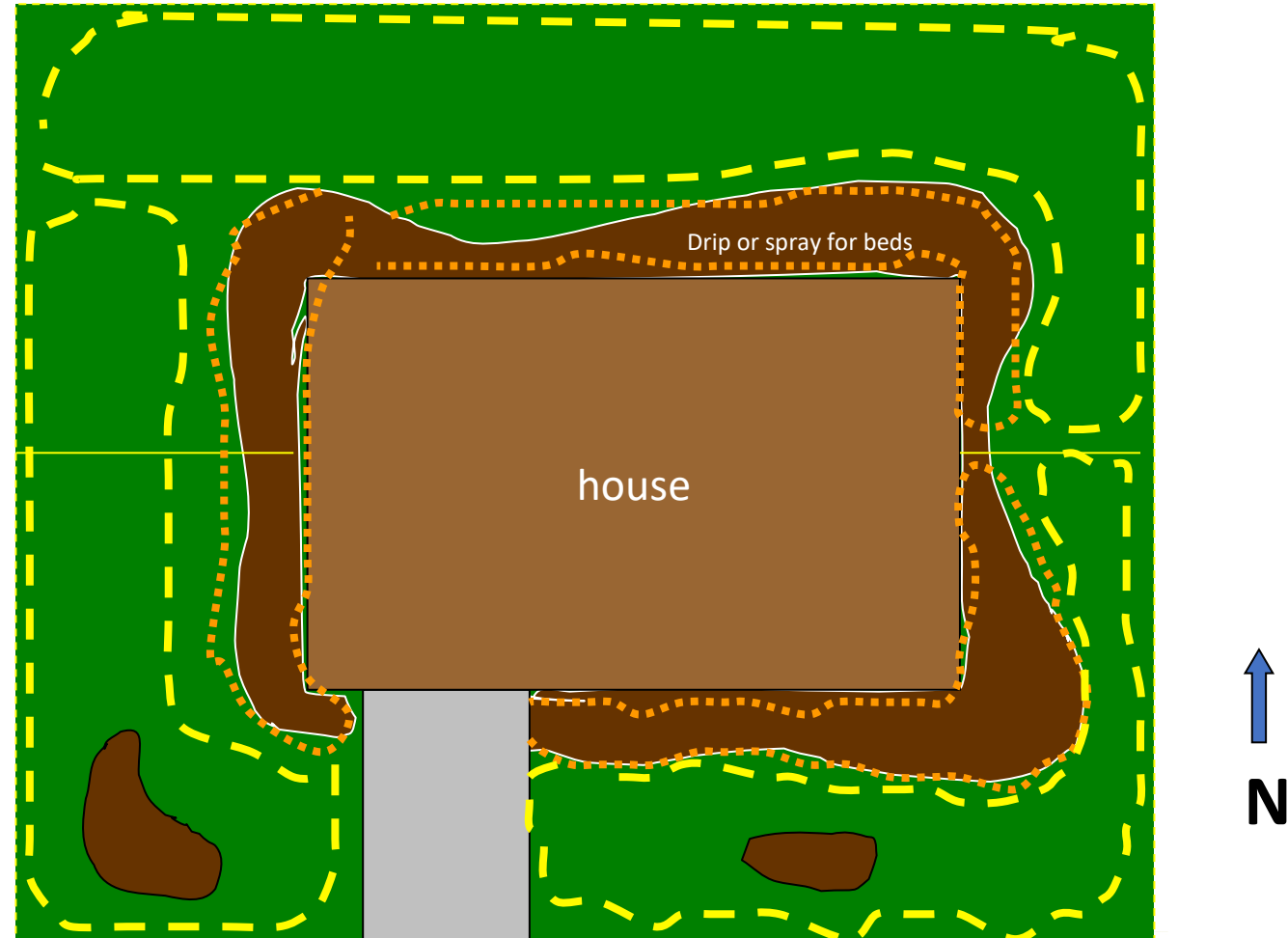
# Irrigation Hydrozoning

Separate irrigation zones should be based on:

- Turf
- Shrub/Flower beds
- Vegetable Gardens
- Exposure/Micro-climate conditions
- Soil types

Run time is based on:

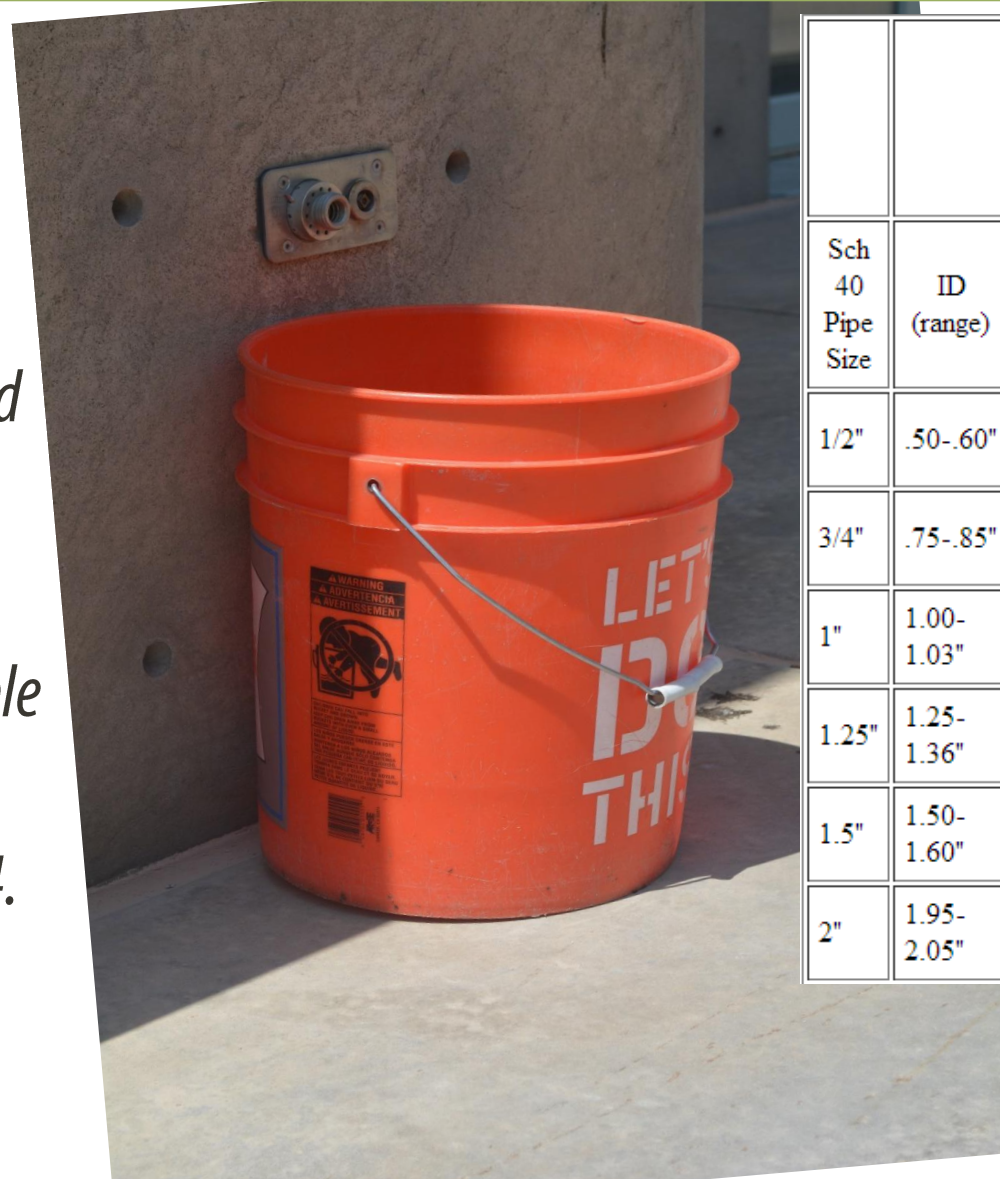
- **Seasonal changes in temperature.**





# Determining Flow Rate

- Use an empty bucket.
- *Fill the bucket for a minute and you have your number.*
- *You can also...*
- *Fill for half a minute and double the gallons.*
- *Fill it for 15 seconds and x by 4.*
- *Or: Gallons Collected / Time in Seconds) X 60 = GPM*



Sch 40 Pipe Size	ID (range)	OD	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*	
			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

# Water Pressure

- *Water pressure that is too high or too low can cause problems.*
- *Misting spray heads and water hammer are signs of high pressure*
- *Heads that don't pop up and dry spots are signs that pressure is too low*
- ***Drip Irrigation: 10-30 psi***
- ***Spray Irrigation: 30-50 psi***





# Backflow Preventer (culinary systems)

Prevents contaminated water from being siphoned into the house.

Required by most city ordinances.





# Pressure Regulator (PRV)

Keeps system pressure within optimal range.

Reduces wear on equipment.

Improves system efficiency.





# PVC vs Poly Pipe

PVC



Poly Pipe







# PVC vs Poly Pipe

## PVC

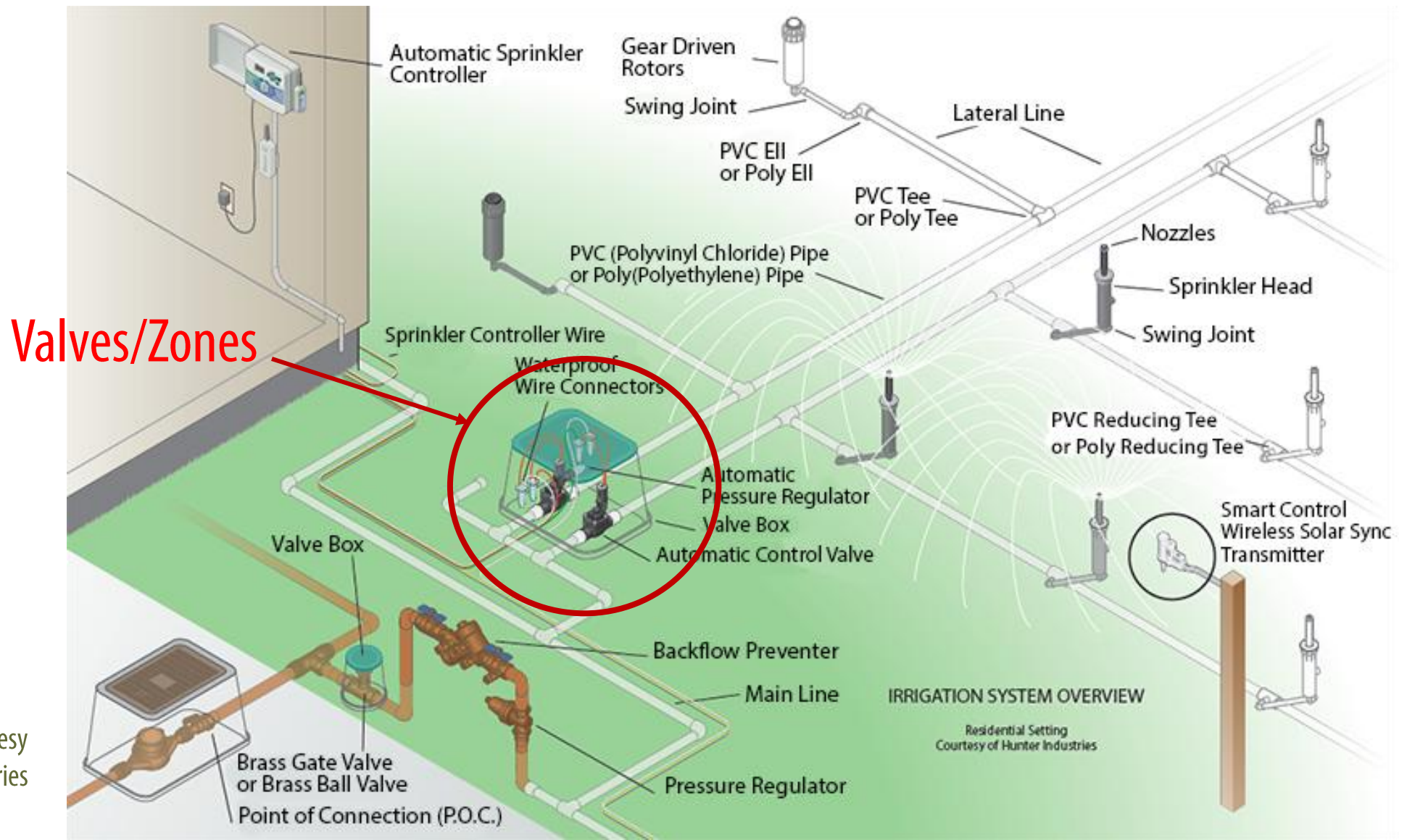
- Rigid/Inflexible
- Can break if water is frozen inside
- More available in warmer climates
- Fittings are secured with glue

## Poly Pipe

- Flexible
- Expands to allow freezing without breakage (can still split)
- More available in colder climates
- Fittings secured with barbs and clamps



# Anatomy of a sprinkler system



Graphic courtesy  
Hunter Industries



# Zone Set Up - Manifolds and Valves





# Sprinkler Valves

Standard  
Valve



Valve w/  
pressure  
regulator/  
filter





# Valve considerations

- Location
  - Should be near area being irrigated, but preferably not IN the lawn
- Each valve should water a zone with drip or spray but not both.
- Valve manifolds help with later repair and replacement (using unions)





# The quick set up of a drip zone manifold

- [https://www.youtube.com/watch?v=yG56\\_Tbyi5o](https://www.youtube.com/watch?v=yG56_Tbyi5o)





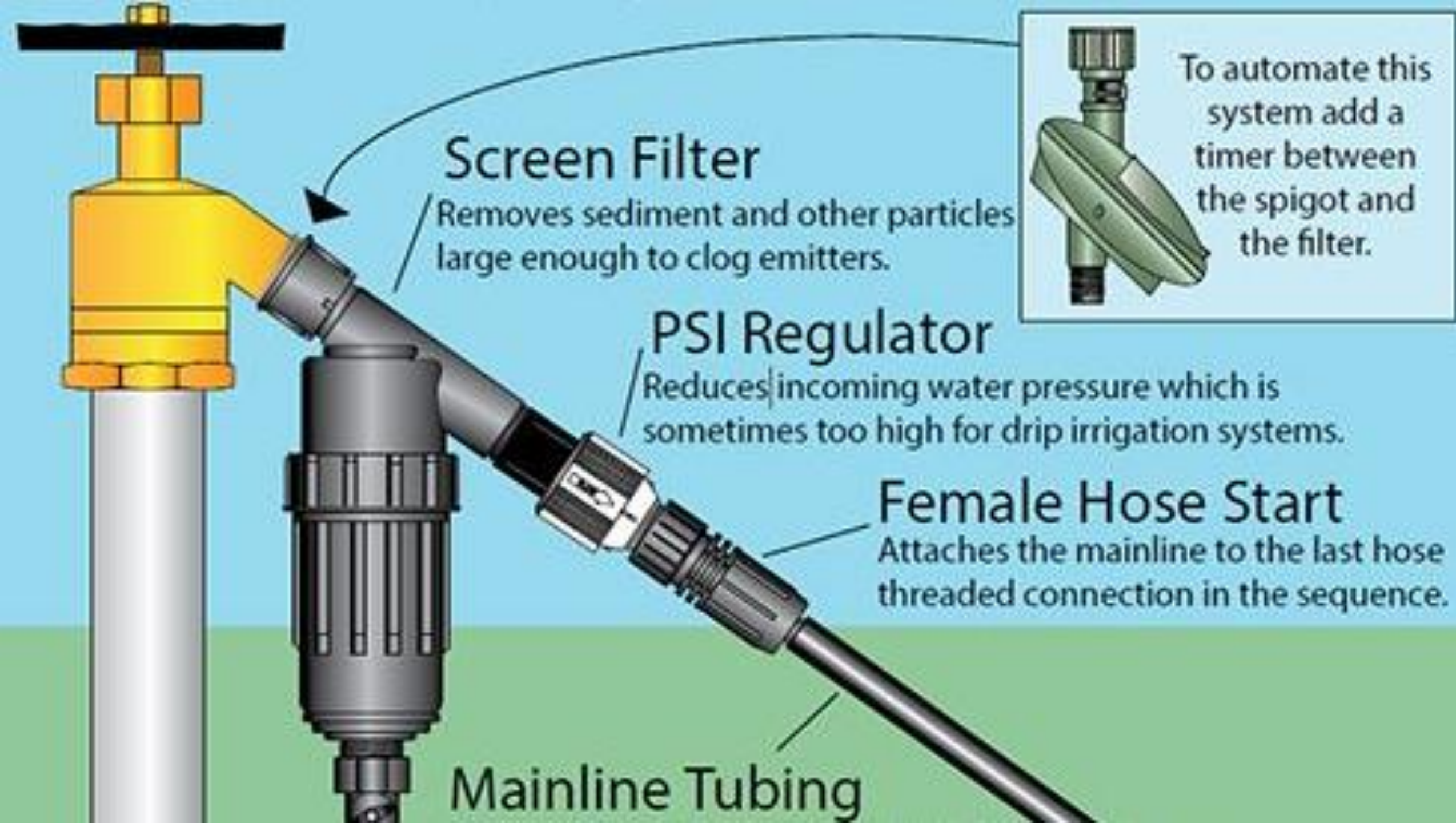
# Drip Irrigation Advantages

## (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).





## Screen Filter

Removes sediment and other particles large enough to clog emitters.

## PSI Regulator

Reduces incoming water pressure which is sometimes too high for drip irrigation systems.

## Female Hose Start

Attaches the mainline to the last hose threaded connection in the sequence.

## Mainline Tubing



To automate this system add a timer between the spigot and the filter.



# Hose end connections work also



You can even purchase battery operated valves for hose end applications



# 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.



# All drip systems need:

Filter

Pressure  
Reducer





# pressure regulator/reducer



Uni Flo

Hi Flo

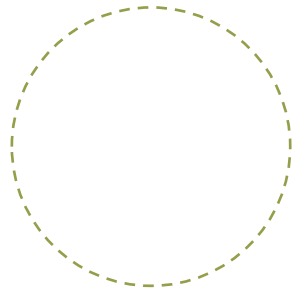
# Pipe types and terms

- PVC (schedule 40)
- Poly
  - 1 inch,  $\frac{3}{4}$  inch or  $\frac{1}{2}$  inch.
  - Used for main lines or lateral lines.
  - Thickness varies depending on use (drip applications have thinner walled pipe)
- Main Line- supplies water to valve assembly (always pressurized) - **Main Line Poly is Thicker**





# Drip irrigation types



**In-Line  
Drip**



**Point  
Source  
Drip**





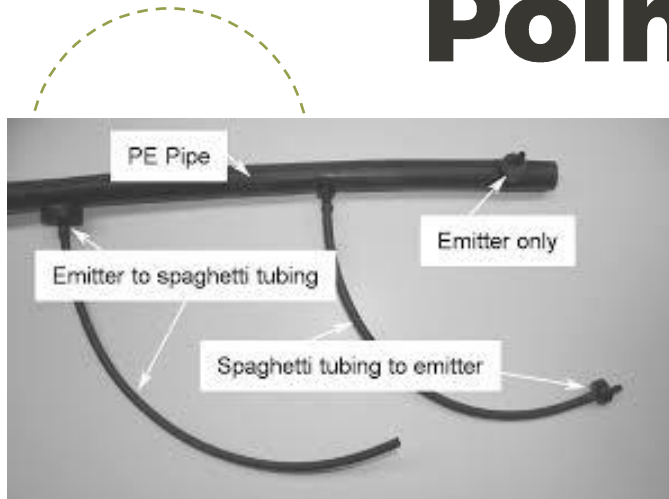
# In-line drip emitters

- 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





# Flower Bed Best Practices

Planting beds should always be watered with drip irrigation.





# Watering Best Practices



Use only one type of irrigation per zone. Don't mix spray and drip lines on same zone.





# Drip irrigation retrofit kits



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





# Spray to Drip Conversion





# For Vegetables in Rows or Raised Beds





# Drip Tape (T-Tape)





# Drip Tape/Trickle Tape/Tape

500 Series  
16 mm - 5/8"

700 Series  
22 mm - 7/8"

900 Series  
29 mm - 1 1/8"

1100 Series  
35 mm - 1 3/8"





# In-Line Drip Tubing





# Drip Emitters

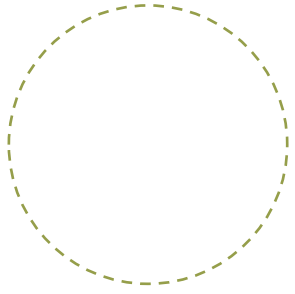






# **Demonstration of Parts and Pieces for Different Application of Drip Irrigation**





# Scheduling and Run Times

- Drip needs to run longer duration because of the slow application rate
- Emitter output determines volume per hour
- Plant material being watered & soils should help you determine the frequency needed.
  
- Example: Veggie raised beds may need irrigation daily for 30 minutes or every other for 60 minutes.
- Example: Zone with established trees and shrubs may only need irrigation 1 time per month but run time may be several hours to soak the root zone.





# Discussion and Set Up

- Drip Irrigation for Veggies/Raised Beds
- Leaks
- Repairing broken items
- Relocating Heads as Turf is removed
- Conversion from Spray to Drip
- Scheduling over the summer
  - (Consider your soil reservoir and how often it needs filled/ how fast it drains for the plants/evaporation/transpiration)
- Fittings and Glue
- All other issues and parts



# Questions ?

The logo for Localscapes, featuring the word "Localscapes" in a stylized font with a trademark symbol, and the website address "Localscapes.com" in a smaller font below it. The logo is set against a dark green circular background.

Localscapes™  
Localscapes.com

- You can do this!
  - Water Management is our personal responsibility
  - Proper irrigation will result in healthy landscaped and a reduction in landscape water use.
- 
- Thank You for coming- Go help others with your knowledge when you can.



# Class



WEBER BASIN WATER  
**LEARNING  
GARDEN**

# Feedback



# Monthly Newsletter





# 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>