

# Spray Head Efficiency

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# Irrigation System and Product Improvements



# Irrigation System and Product Improvements



# Efficient watering is the goal

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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 (desert climates with non desert plants)
- 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





# 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.*



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

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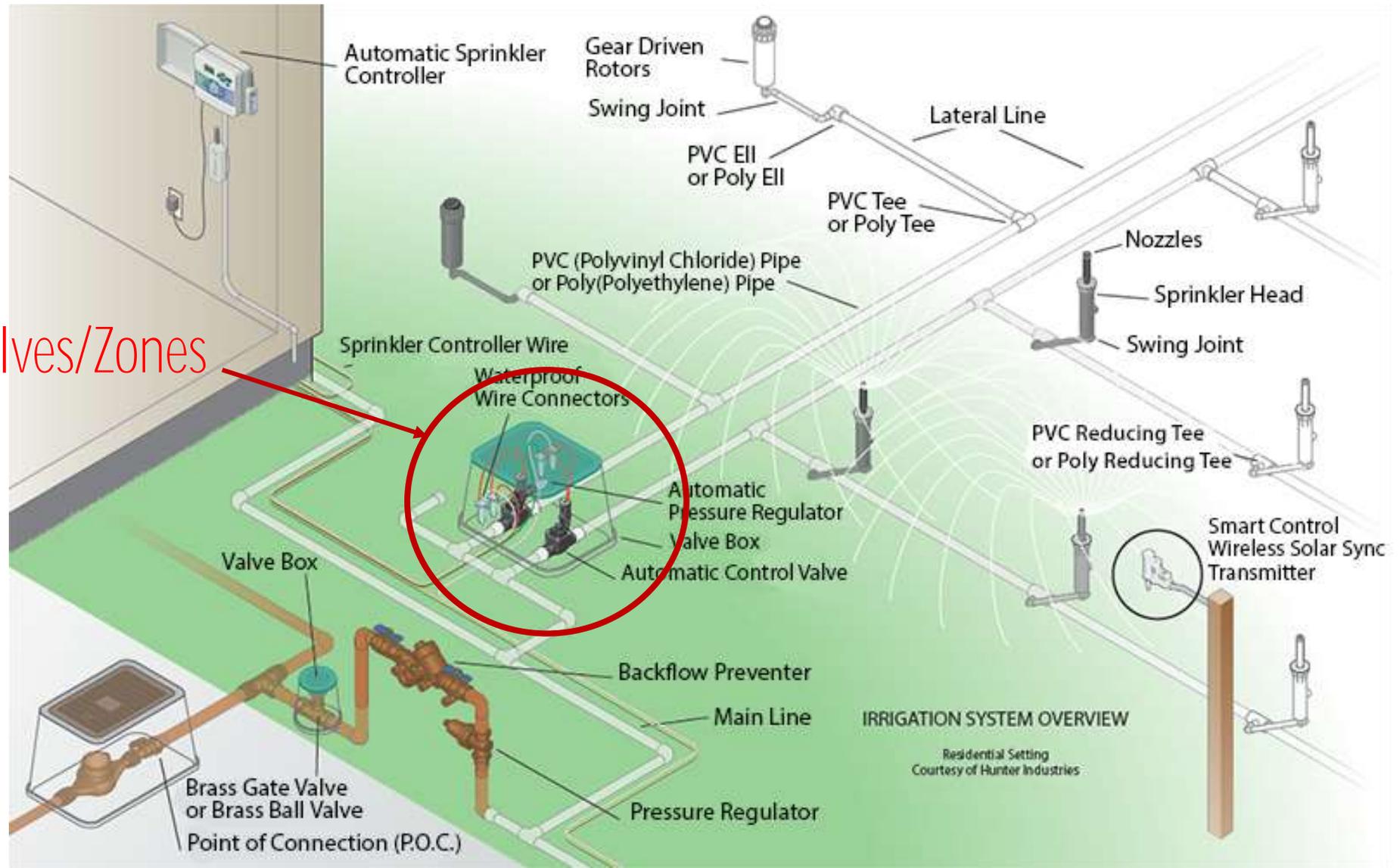
- *Water pressure that is too high or too low can cause problems.*
- *Misting spray heads and water hammer are signs of high pressure*
- ***Heads that don't pop up and dry spots are signs that pressure is too low***
- *Drip Irrigation- 10-30 psi*
- *Spray Irrigation- 30-50 psi*



# Anatomy of a sprinkler system

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Valves/Zones

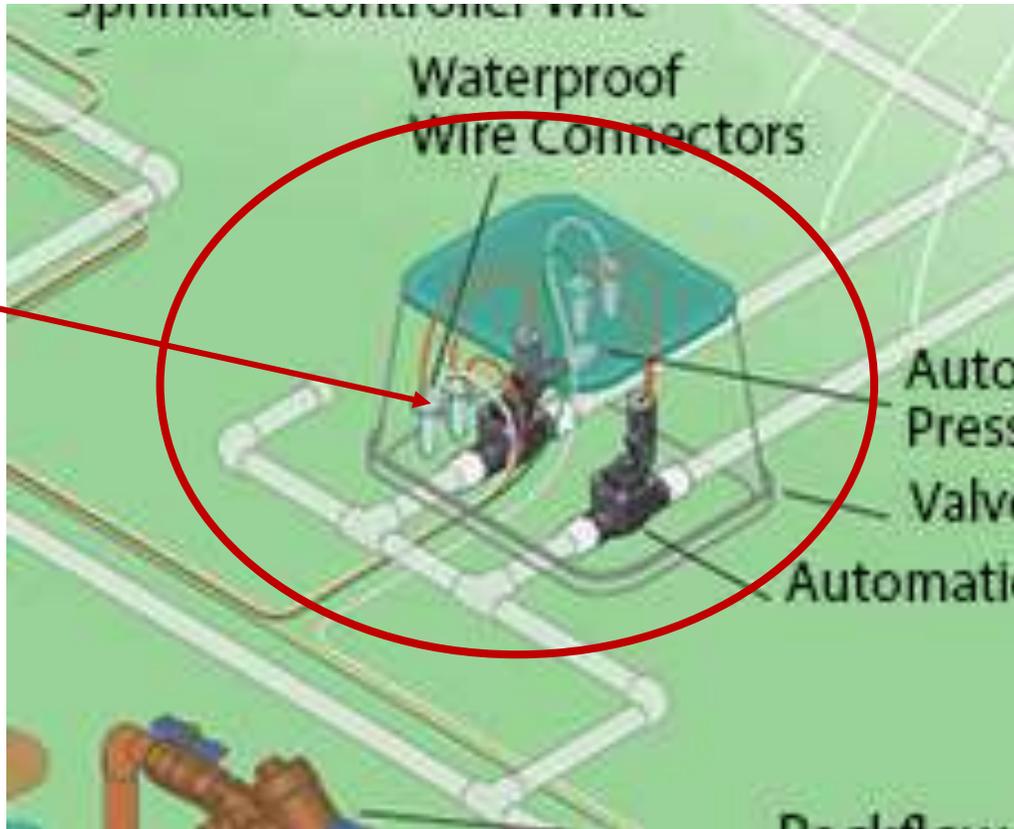


Graphic courtesy  
Hunter Industries

# Anatomy of a sprinkler system

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Valves/Zones



Graphic courtesy  
Hunter Industries

# Sprinkler Valves

Standard Valve



Valve w/  
pressure  
regulator/  
filter



# Zone Set Up - Manifolds and Valves



# Valve considerations

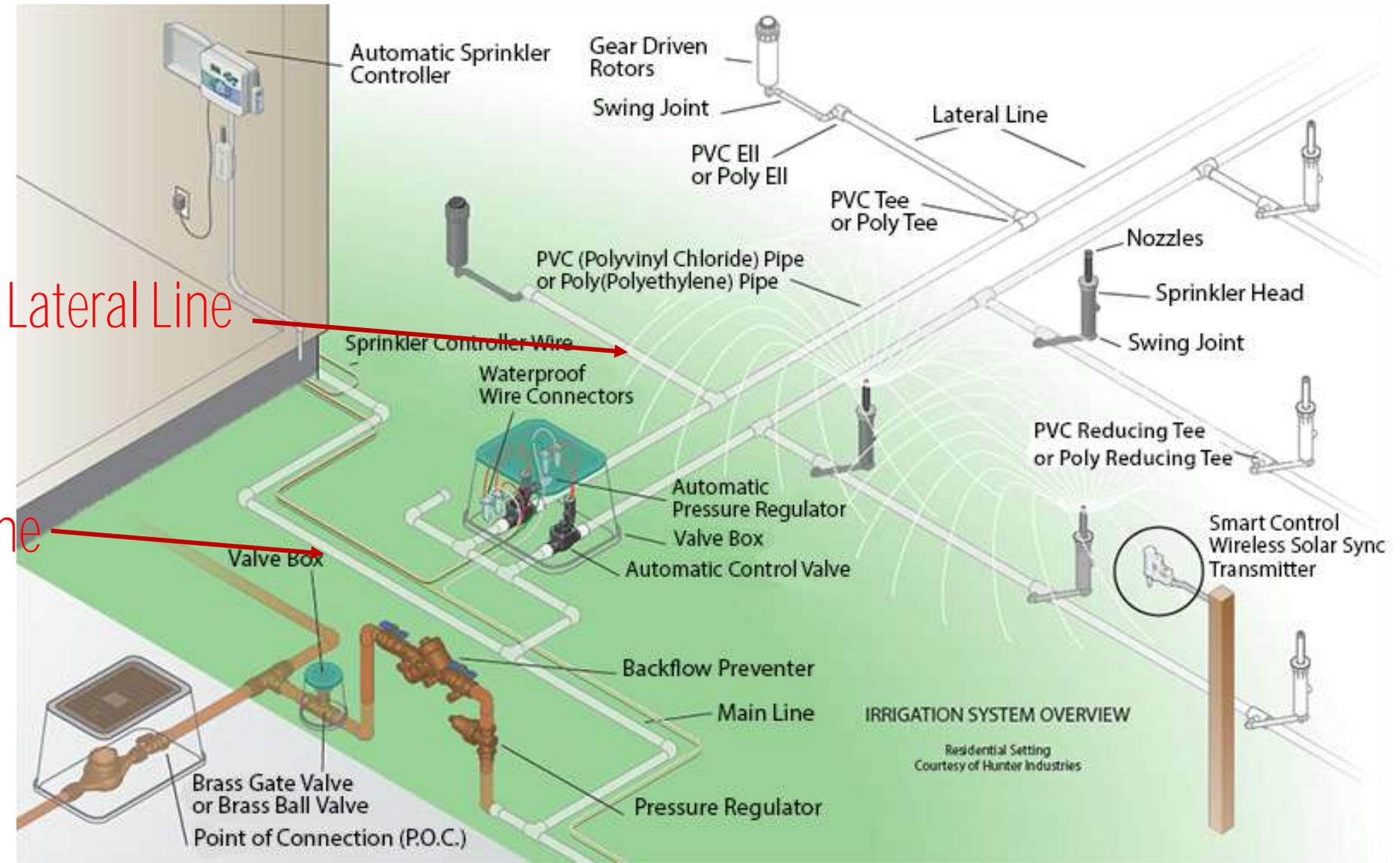
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- Location
  - Should be near area being irrigated, but not IN the lawn
- Each valve should water a zone with drip or spray but not both.
- Valve manifolds help with later repair and replacement (using unions)



# Anatomy of a sprinkler system

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Lateral Line

Main Line

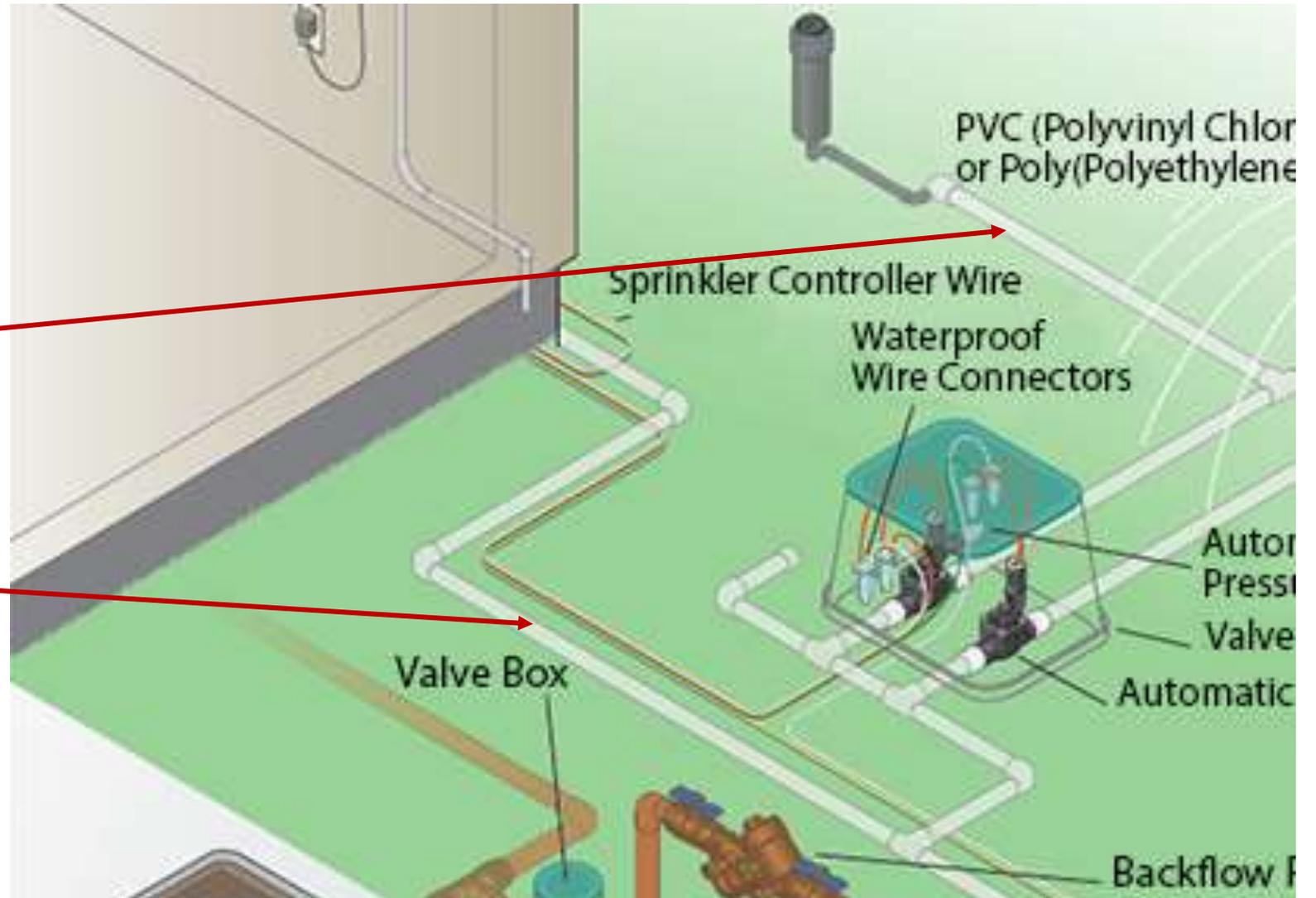
Graphic courtesy  
Hunter Industries

# Anatomy of a sprinkler system

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Lateral Line

Main Line



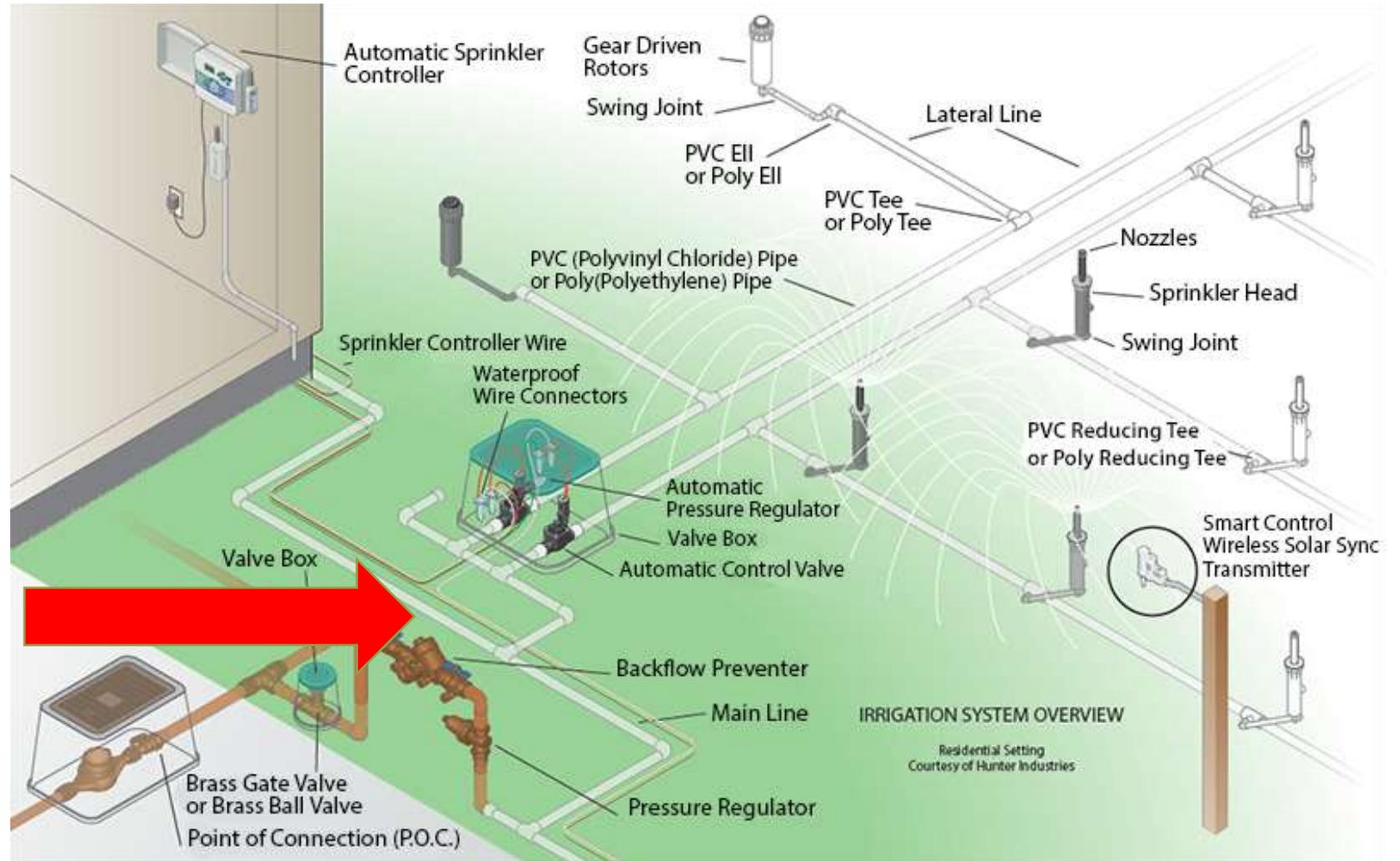
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# Main Line

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Constantly  
pressurized.

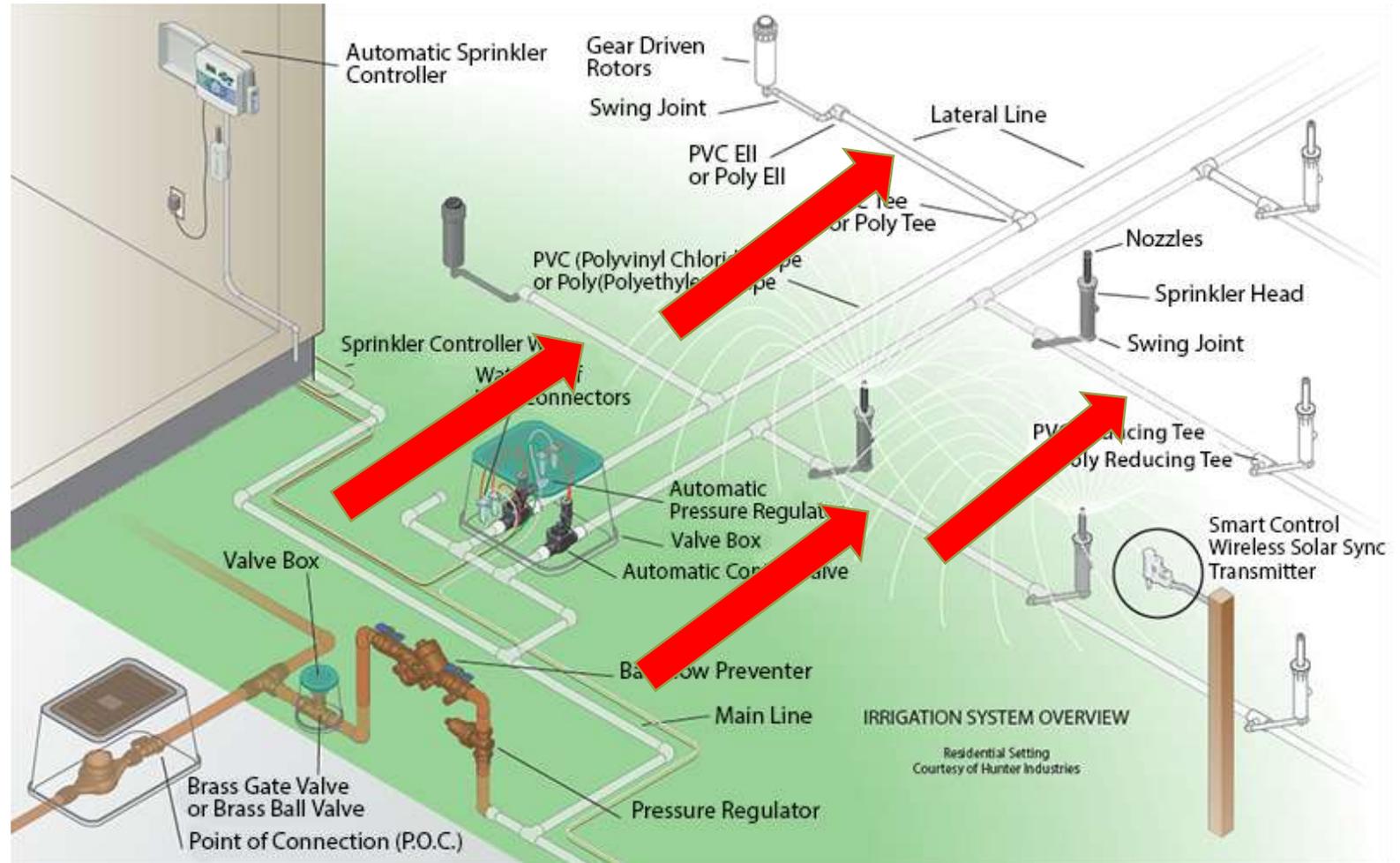
Should be larger or  
equal in size to  
lateral lines.



# Lateral Line

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Pressurized only  
when the valve  
is in operation



# Filtration- a necessity with secondary water



Filter  
Pressure  
Reducer

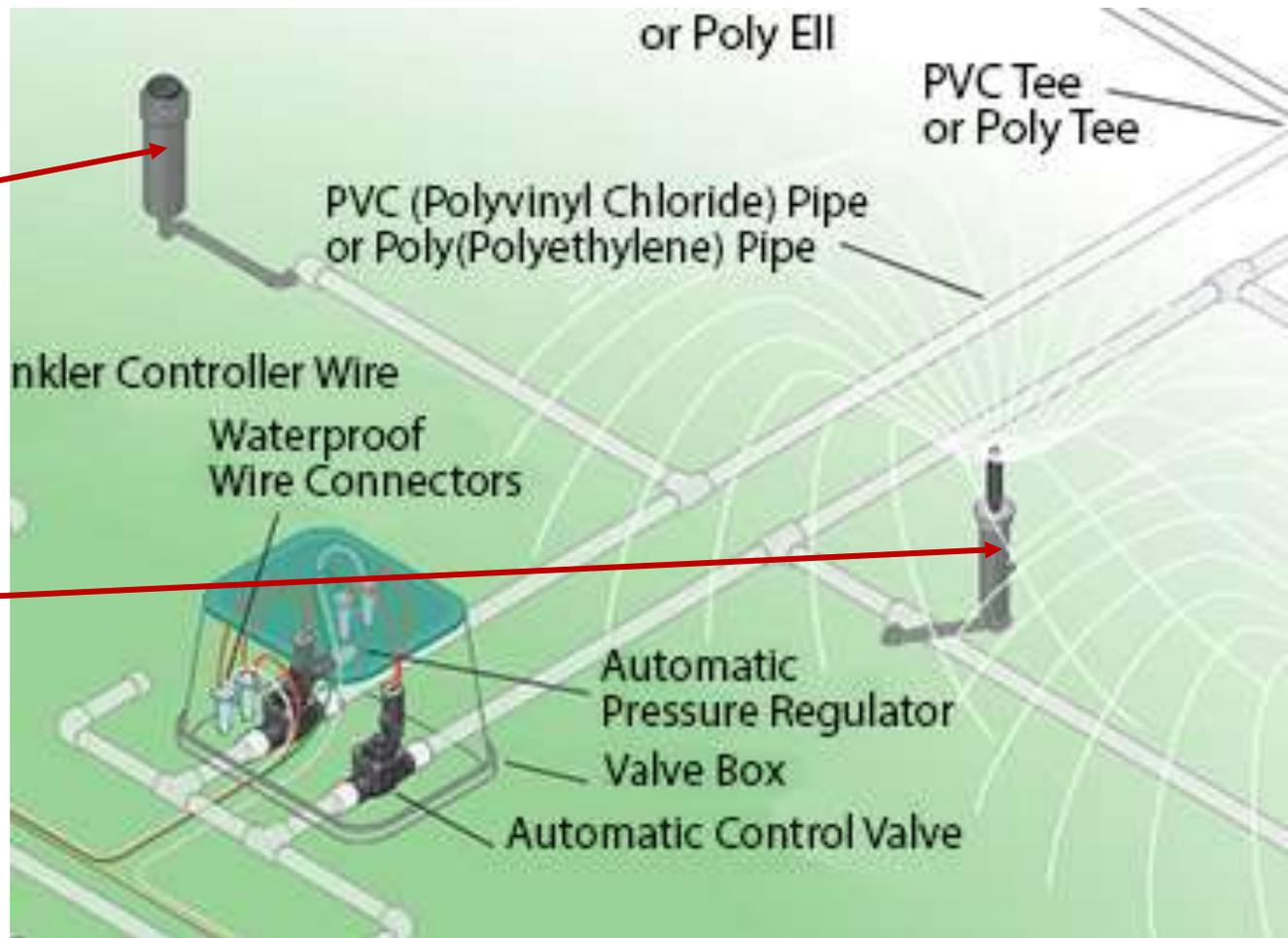
For Drip a mesh/screen size of 150 is probably adequate. The higher the number the finer/higher the filtration.

# Anatomy of a sprinkler system

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Rotor Heads

Spray Heads



# Fixed spray heads

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Best for small areas

Highest  
precipitation rates



# Fixed spray nozzles

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Choose from  
Full  
Half  
Quarter  
SST  
U



# Fixed spray nozzles

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Choose the right  
nozzle for the  
right application

## Terminology for spray Fixed Pattern Spray Heads

- AP- Adjustable Pattern
- VAN- Variable Arc Nozzle (0-360 degrees)
- HE VAN- High Efficiency Variable Arc
- F- Full Circle
- H- Half Circle
- Q- Quarter Circle
- SST- Side Strip Pattern (for narrow spaces)
- SQ- Square Pattern
- U-Series (general spray nozzle type)
- DSS- Dual Spray
- MPR- Matched Precipitation Rate

# Fixed spray nozzles

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Color Coding for spray Fixed Pattern Spray Heads

Every company color codes their products

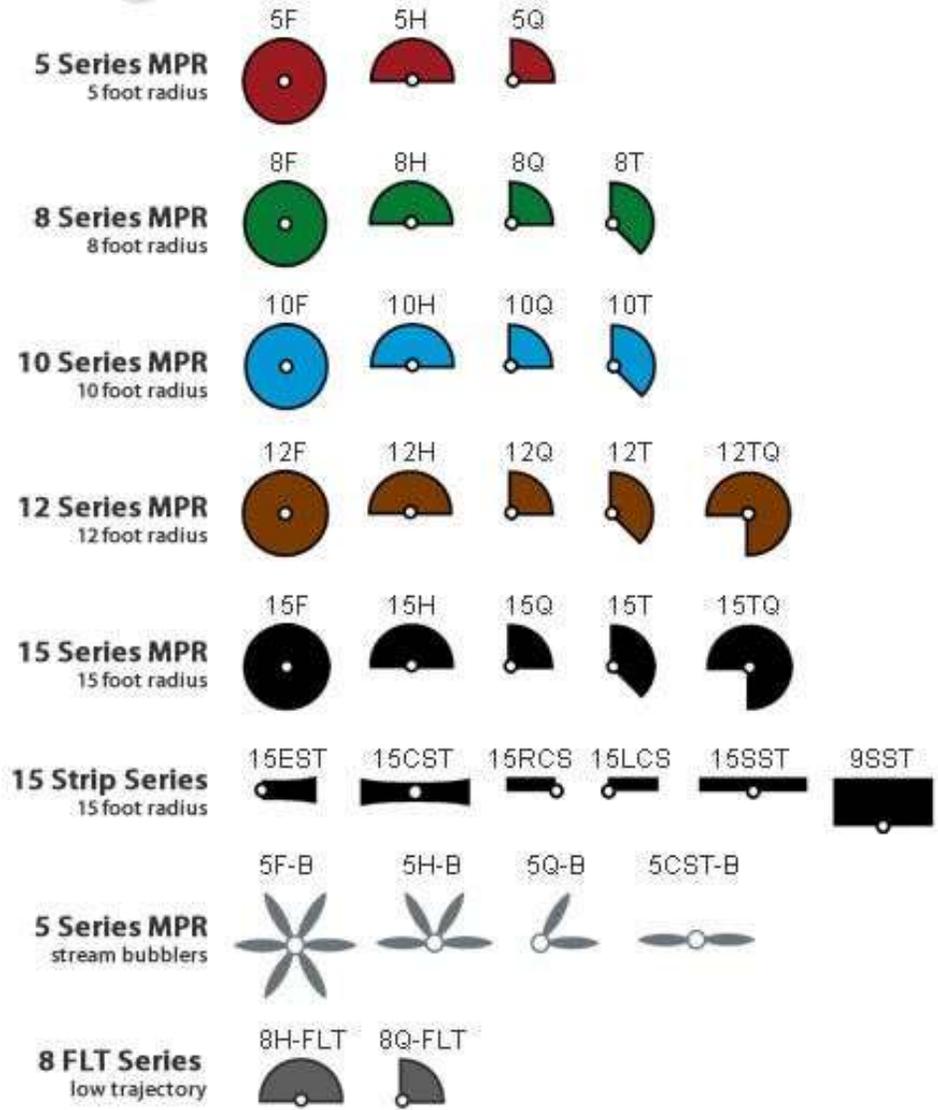
Choose the right  
nozzle for the  
right application

- Color codes for radius of throw (8, 10, 12, 15, 18 ft)
- This will help you as you glance to see if you have the right one to get matched head to head coverage. They have the same MPR so you can mix nozzles if they are the same series type.





# Rain Bird MPR example for color and spray pattern



# Rotary nozzles

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- Can be used in most area sizes
  - Lower precipitation rate



# Rotary spray nozzles

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Lower Rate of  
Application and  
Better Uniformity  
Longer Run Time



Rotary nozzles are adjustable for 3/4, half, quarter or in-between to meet the needs of the space (45-270 degree adjustment)

# Rotor heads

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Best used in large  
areas  
Lower  
precipitation  
rates



# Rotor heads

Localscapes  
Localscapes.com

Best used in large  
areas

They have lower  
precipitation  
rates

## Specs

**Precipitation rate:** 0.20 to 1.50 in/hr (5 to 38 mm/h)

**Radius:** 25 to 50 feet (7.6 to 15.2 m)

Radius may be reduced up to 25% with radius reduction screw

**Pressure:** 25 to 65 psi (1.7 to 4.5 bar)

**Flow Rate:** 0.76 to 9.63 gpm (3.0 to 36.6 l/m; 0.17 to 2.19 m<sup>3</sup>/h)

Reversing full- and part-circle adjustment from 40° - 360°  
Standard nozzle trajectory of 25°. Low angle nozzle trajectory of 10°. MPR nozzles varied nozzle trajectory between 12° - 25°.



# Rotor nozzles

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Choose the right  
Gallons Per Minute  
for the area the head  
is covering



# Impact heads

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Best used in large  
areas  
Similar  
precipitation rates  
to rotor heads



[https://youtu.be/GzXmWd\\_6Ktg](https://youtu.be/GzXmWd_6Ktg)

# Impact heads

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# Swing joints

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Helps sprinkler heads be more adjustable and less prone to breaking when impacted





# Broken Heads or Nozzles

- Results from snow plows or shovels
- Freezing
- Cars driving on it
- Lawn mowers

These should be fixed right away to avoid water waste and poor coverage issues



# Examples of Water Waste





# Water, Water, Everywhere



# Best watering practices/standards

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Lawn is always  
watered separately  
from other plants.



# Flower Bed Best Practices

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Planting beds are  
always watered  
with drip irrigation.



# Watering Best Practices

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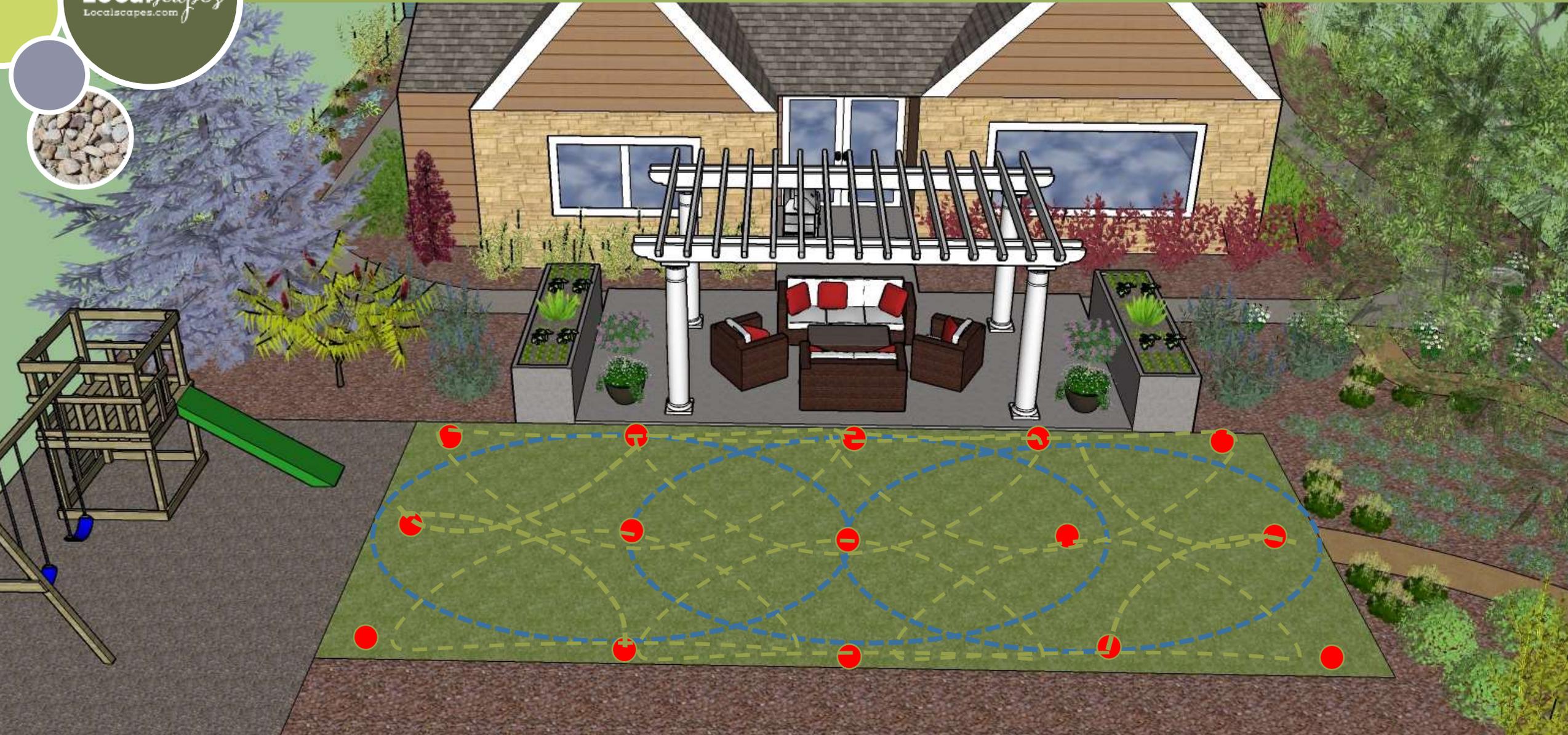


Use only one type of irrigation per zone. Don't mix spray and drip lines on same zone.



# Head-to-head coverage

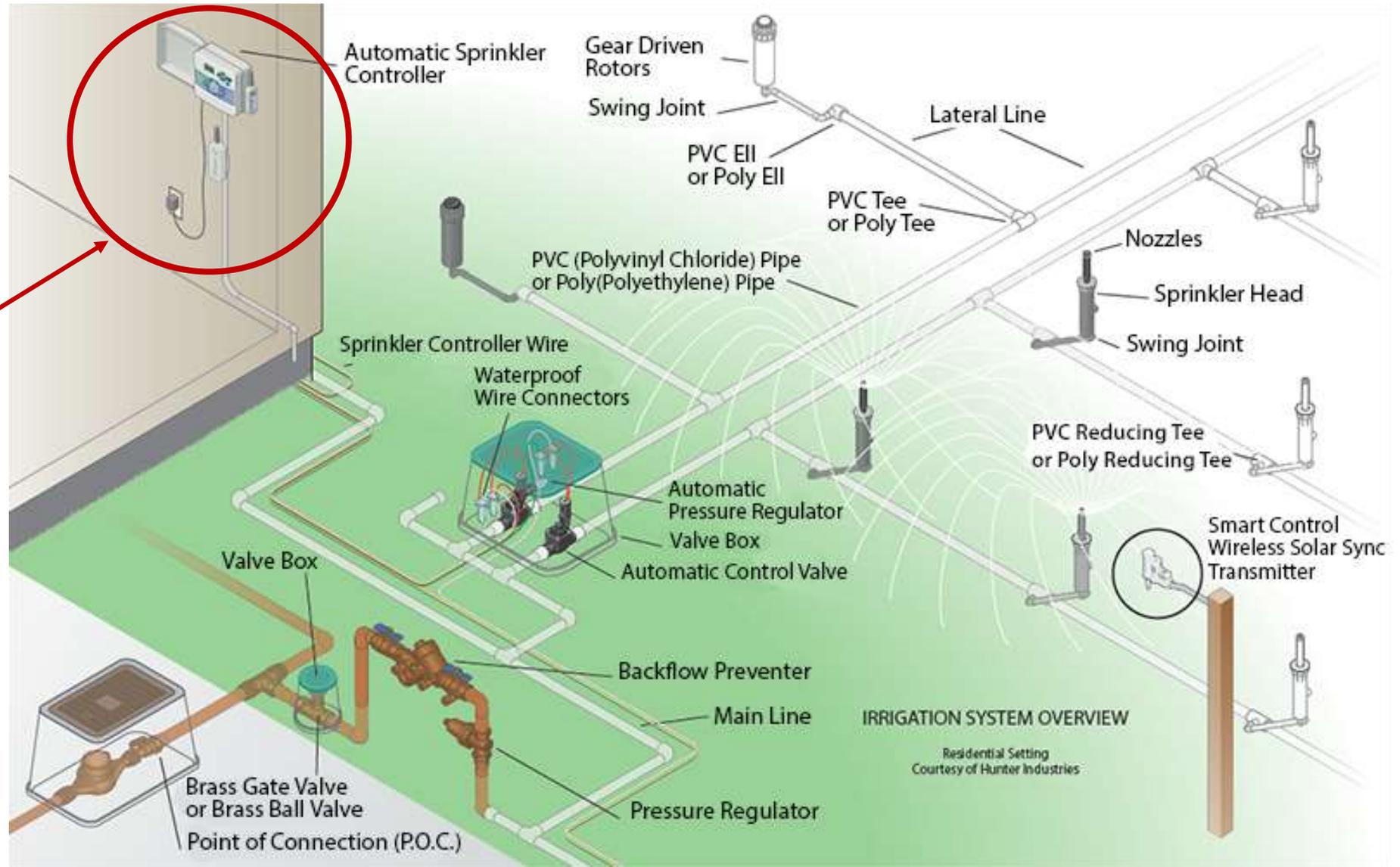
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# Anatomy of a sprinkler system

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Controllers



Graphic courtesy  
Hunter Industries



# How do traditional controllers work?

- Valves turn on and off at specified times for specified duration.
- Need to be reprogrammed (at least seasonally) to ensure water application matches plant requirements





# How do weather-based irrigation controllers (WBICs) work?

- Calculate ET
- Analyze field data, plant water requirements, soil type and slope to determine how frequently and how long to water.



# Smart Controller Rebate Program

Receive a \$75 rebate for EPA WaterSense certified smart controllers that run on weather or soil moisture based operation.

Apply at [www.utahwatersavers.com](http://www.utahwatersavers.com)



Utahwatersavers.com



## It Pays to Save

Ready to start saving water on your landscape or in your home? Create a Utah Water Savers account to view cash rebates and programs available in your area.

**Programs and Rebates**

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# Smart Technology still needs user input

Smart control will not fix poor design and requires smart input to be effective



# Questions ?

The logo for Localscapes, featuring the word "Localscapes" in a stylized font with "Localscapes.com" underneath, all within a dark green circular background. A partial image of mulch is visible in the top left corner.

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- 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.