

Make Your Sprinkler System Work Correctly and Efficiently

David Rice

Weber Basin Water Conservancy District



WEBER BASIN WATER
**LEARNING
GARDEN**

Class Feedback



Monthly Newsletter



Efficient watering is the goal

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

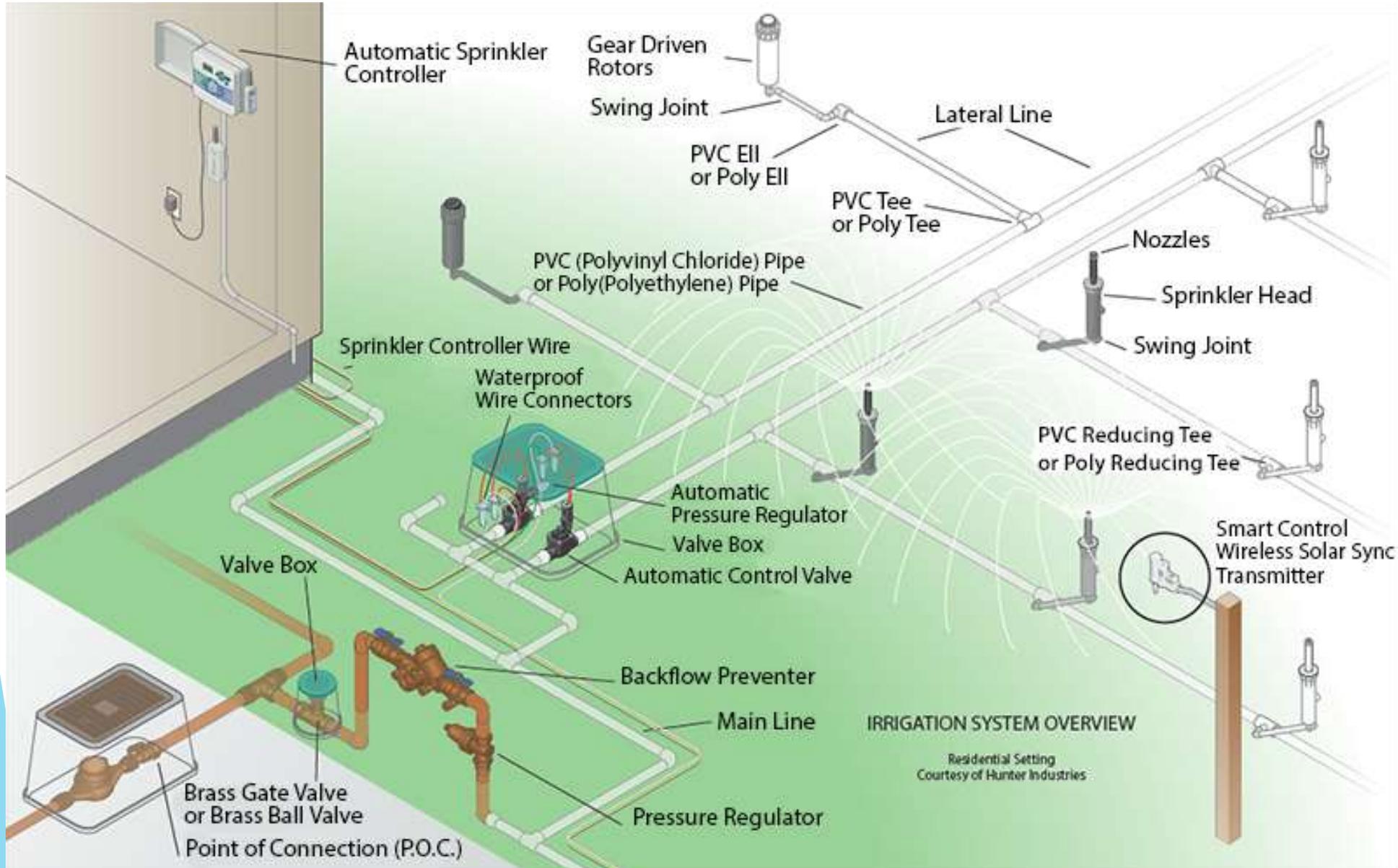




Why Irrigate?

- ▶ When a plant can't get enough water from the environment (desert climates with non-desert plants)
 - ▶ Temporary: after transplanting
 - ▶ Temporary: during drought or no rainfall
 - ▶ Permanent: in areas that have no natural water source (Pots and indoors)
- ▶ Irrigation systems
 - ▶ Sprinkler (spray) vs. drip/low volume
 - ▶ Manual or timer (controller)

Anatomy of a sprinkler system



Graphic courtesy
Hunter
Industries

Backflow Preventer (culinary systems)

Prevents contaminated water from being siphoned into the house.
Required by most city ordinances.



Pressure Regulator (PRV)

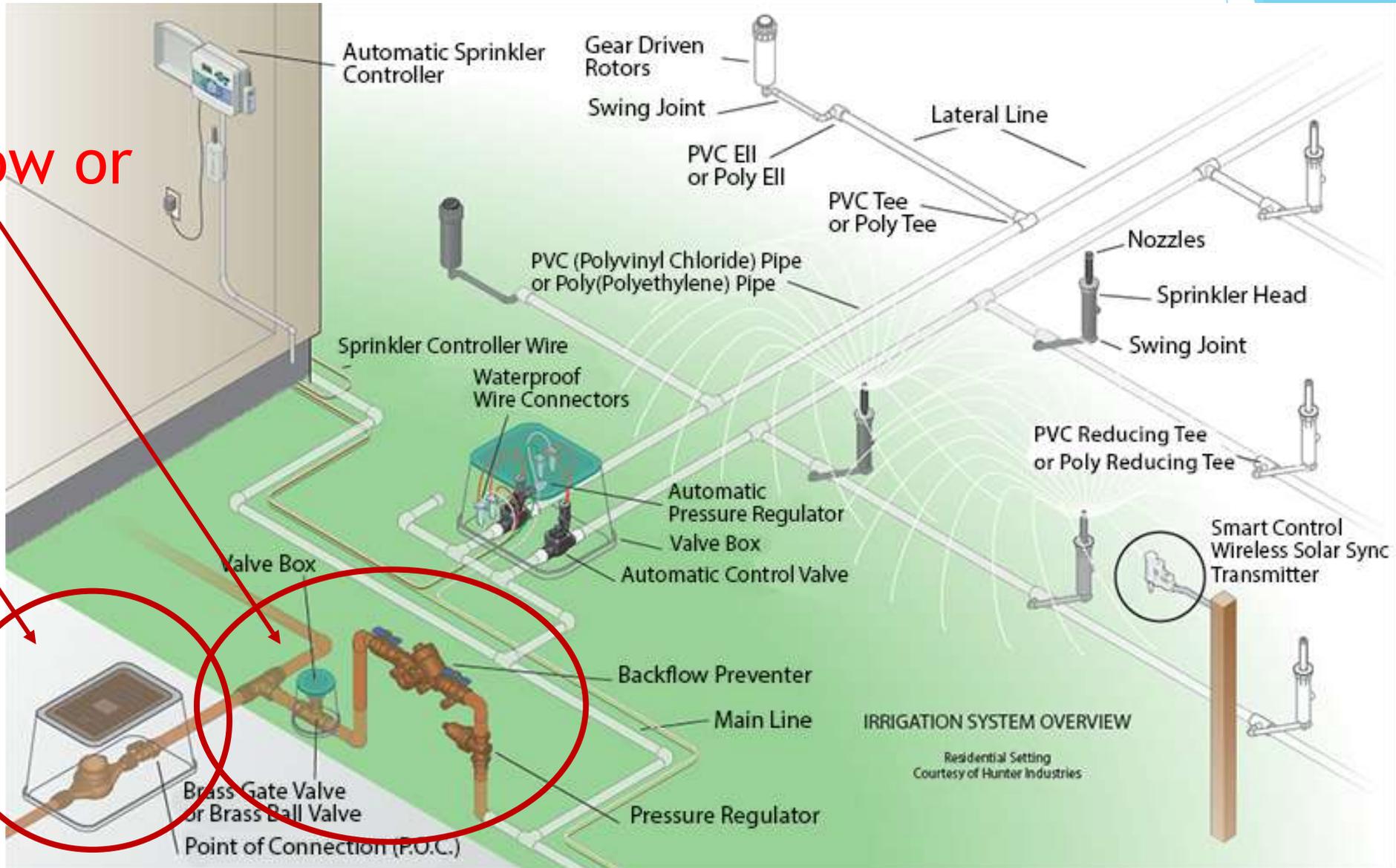
Keeps system pressure within optimal range.

Reduces wear on equipment.

Improves system efficiency.



Anatomy of a sprinkler system



Backflow or filters

Meter/
POC

Secondary Meter

Records water consumption.

Data can be accessed through online portals in hourly increments



Pressure and Filtration



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.

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*



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.*



			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

PVC vs Poly Pipe

PVC



Poly Pipe



PVC vs Poly Pipe

PVC

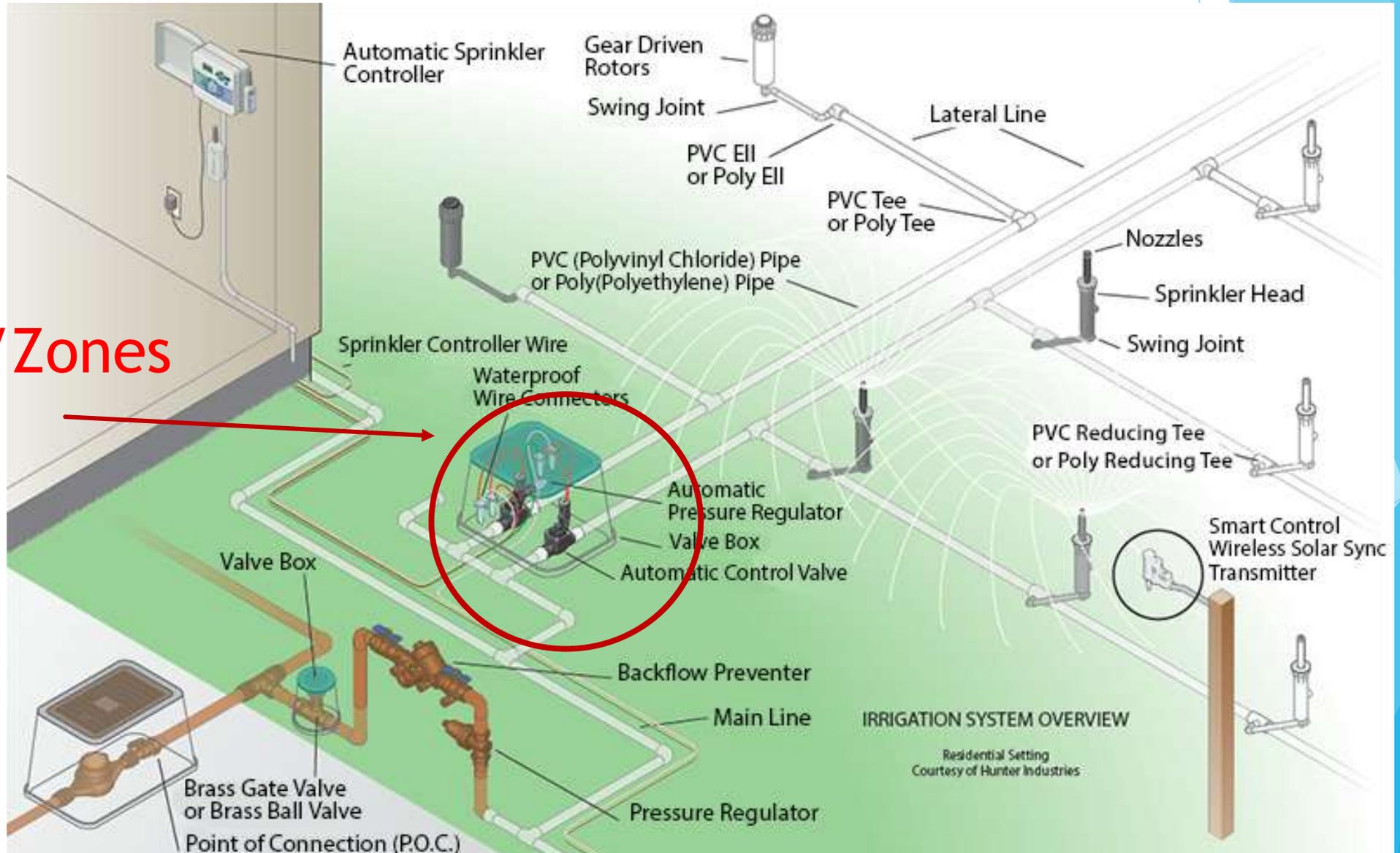
- Rigid/Inflexible
- Can break if water is frozen inside
- More available in warmer climates
- Fittings are secured with glue

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

Valves/Zones



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 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)



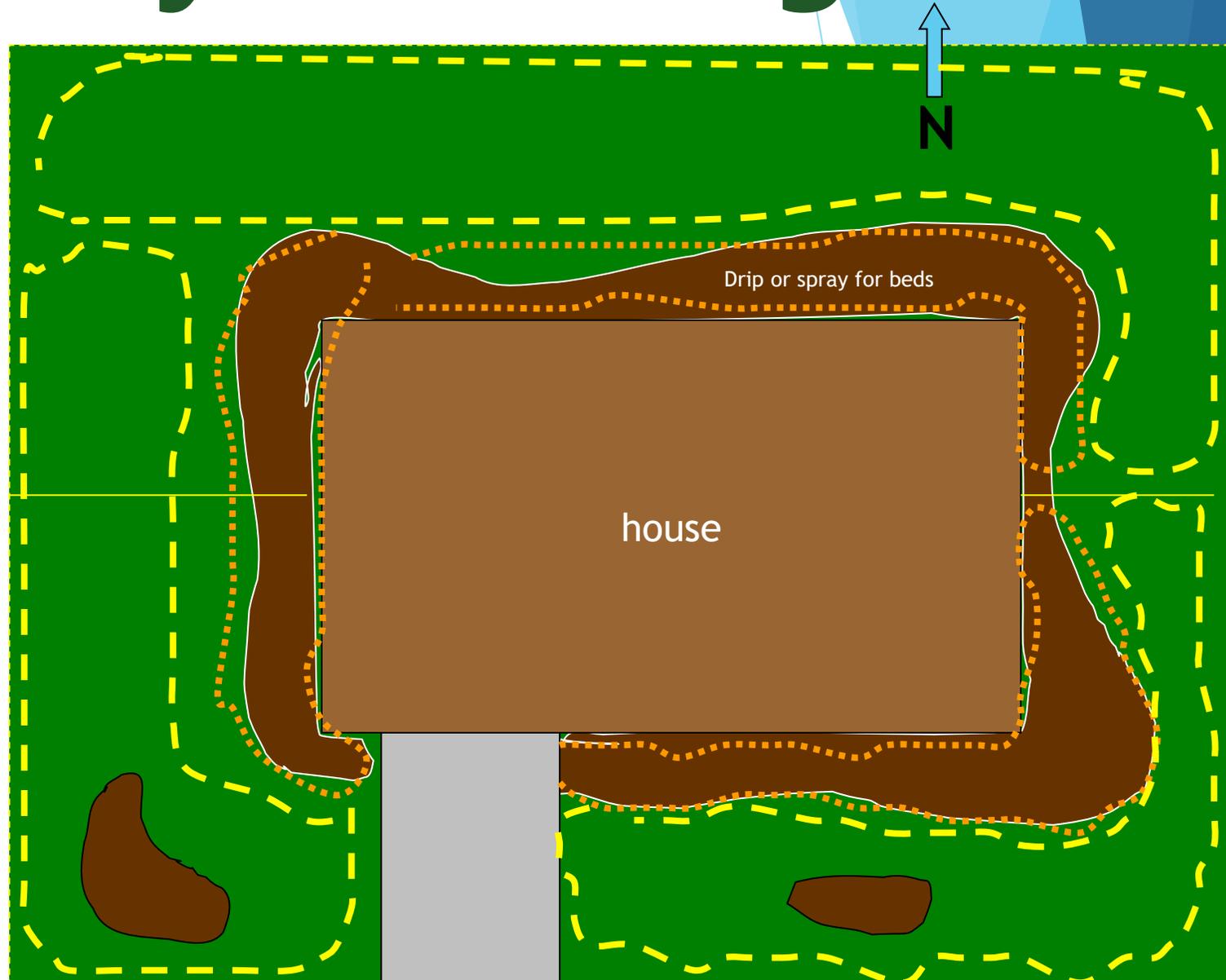
Irrigation Hydrozoning

Separate irrigation zones should be based on:

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

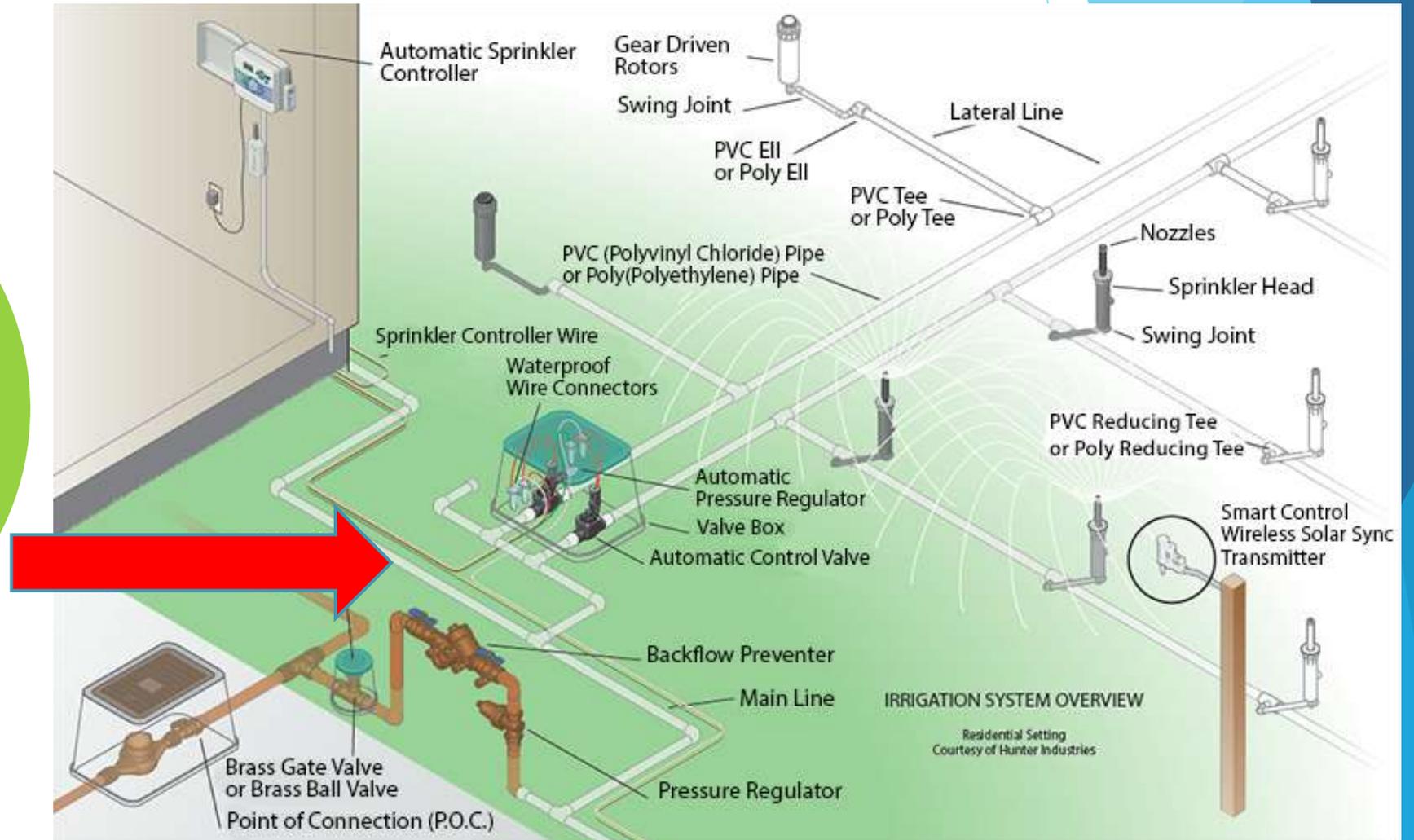
Run time is based on:

- **Seasonal changes in temperature.**



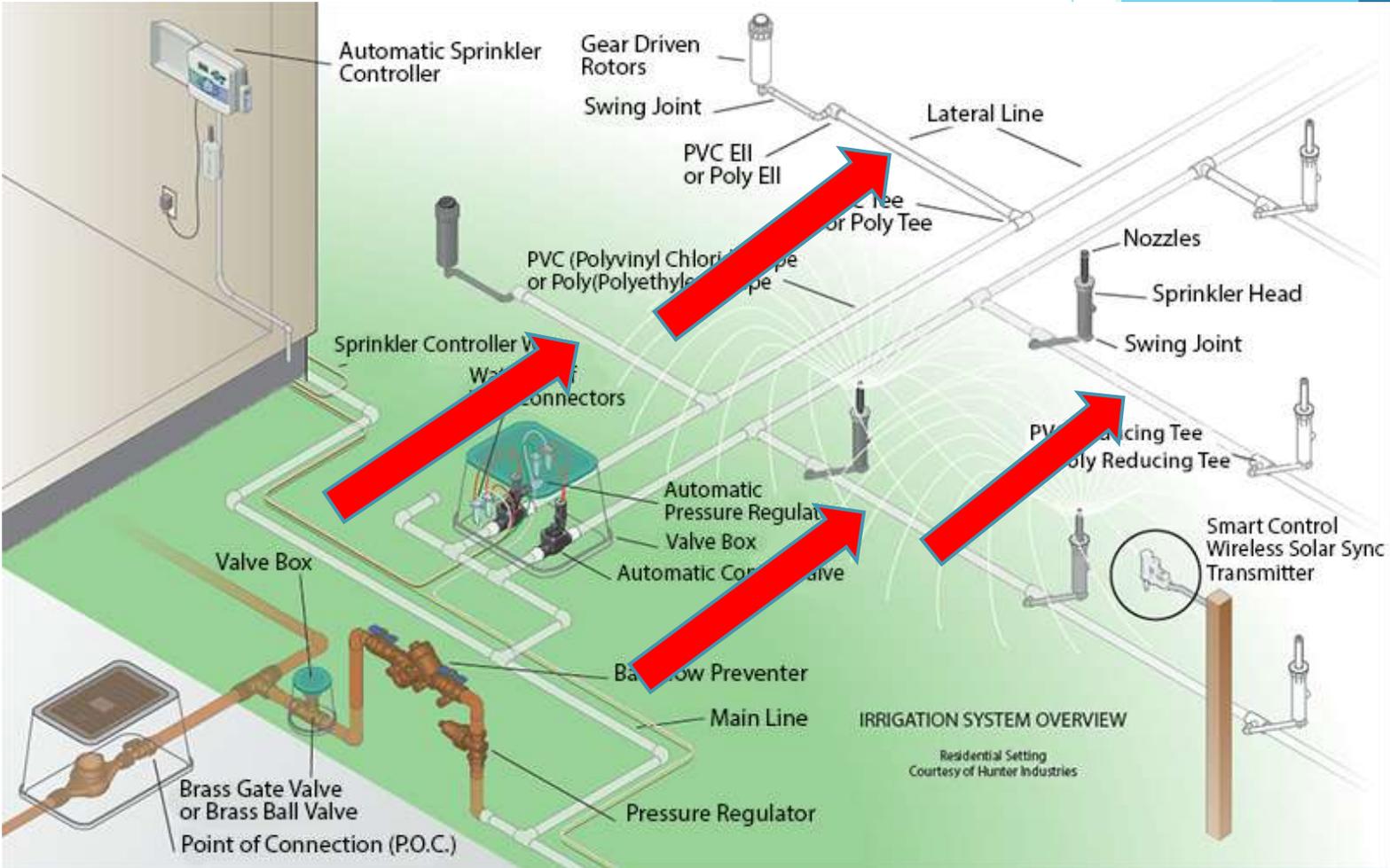
Main Line

Constantly
pressurized.
Should be
larger or
equal in size
to lateral
lines.



Lateral Line

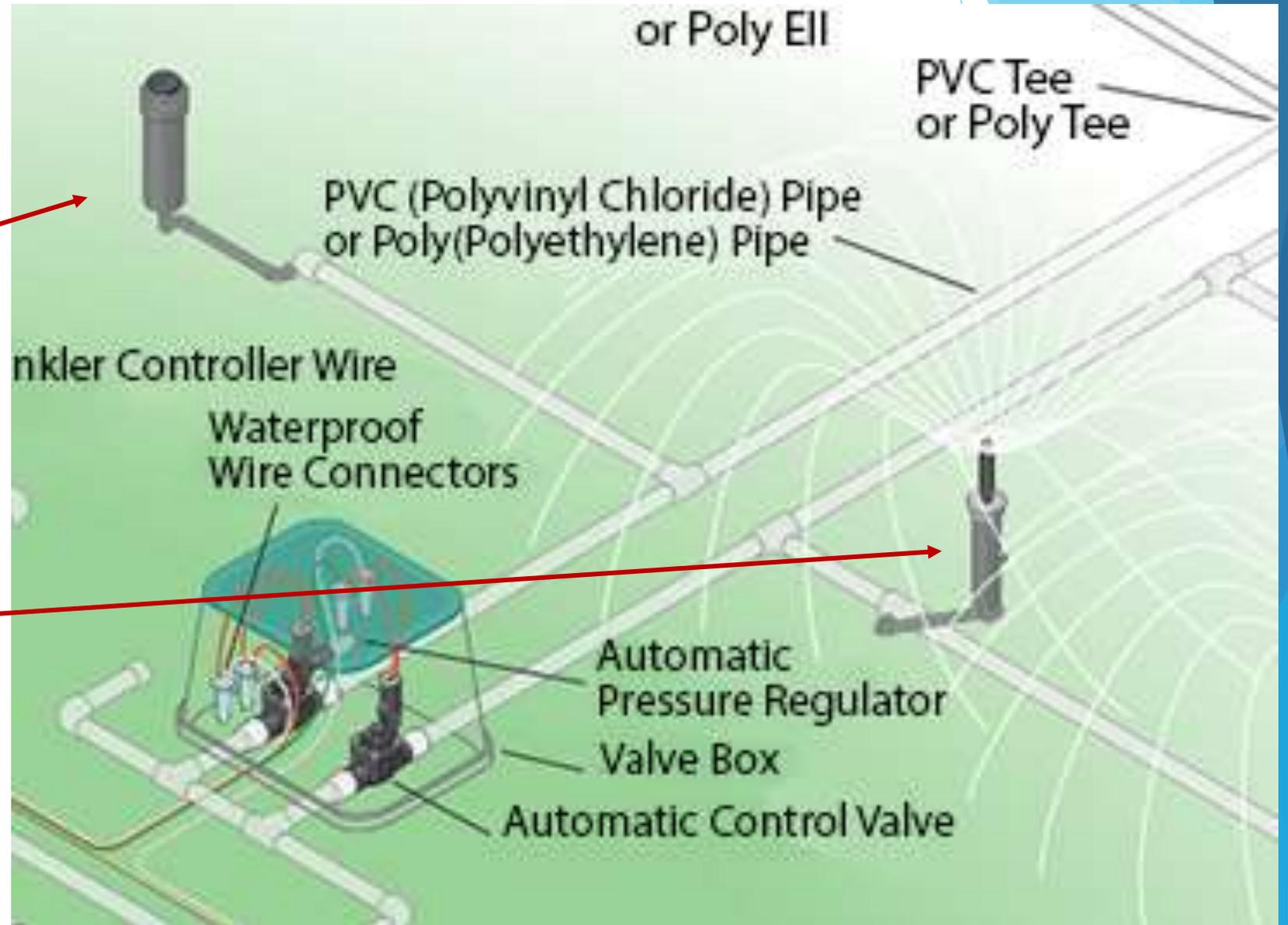
Pressurized only when the valve is in operation



Anatomy of a sprinkler system

Rotor
Heads

Spray
Heads



Fixed spray heads

Best for small areas

Highest precipitation rates



Fixed spray nozzles

Choose from
Full
Half
Quarter
SST
U

**Matched Precipitation Rates
within brands. Same rate,
different radius**



Fixed spray nozzles

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

Color Coding for spray Fixed Pattern Spray Heads

Every company color codes their products

- 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.

Choose the
right nozzle
for the right
application



Rain Bird MPR example for color and spray pattern



5 Series MPR 5 foot radius	5F	5H	5Q			
8 Series MPR 8 foot radius	8F	8H	8Q	8T		
10 Series MPR 10 foot radius	10F	10H	10Q	10T		
12 Series MPR 12 foot radius	12F	12H	12Q	12T	12TQ	
15 Series MPR 15 foot radius	15F	15H	15Q	15T	15TQ	
15 Strip Series 15 foot radius	15EST	15CST	15RCS	15LCS	15SST	9SST
5 Series MPR stream bubblers	5F-B	5H-B	5Q-B	5CST-B		
8 FLT Series low trajectory	8H-FLT	8Q-FLT				

Rotary nozzles

Can be used in
most area sizes

Lower
precipitation
rate



Rotary spray nozzles



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

Best used in
large areas
Lower
precipitation
rates



Rotor heads



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 m³/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

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



Impact heads

Best used in
large areas
Similar
precipitation
rates to rotor
heads



Impact heads

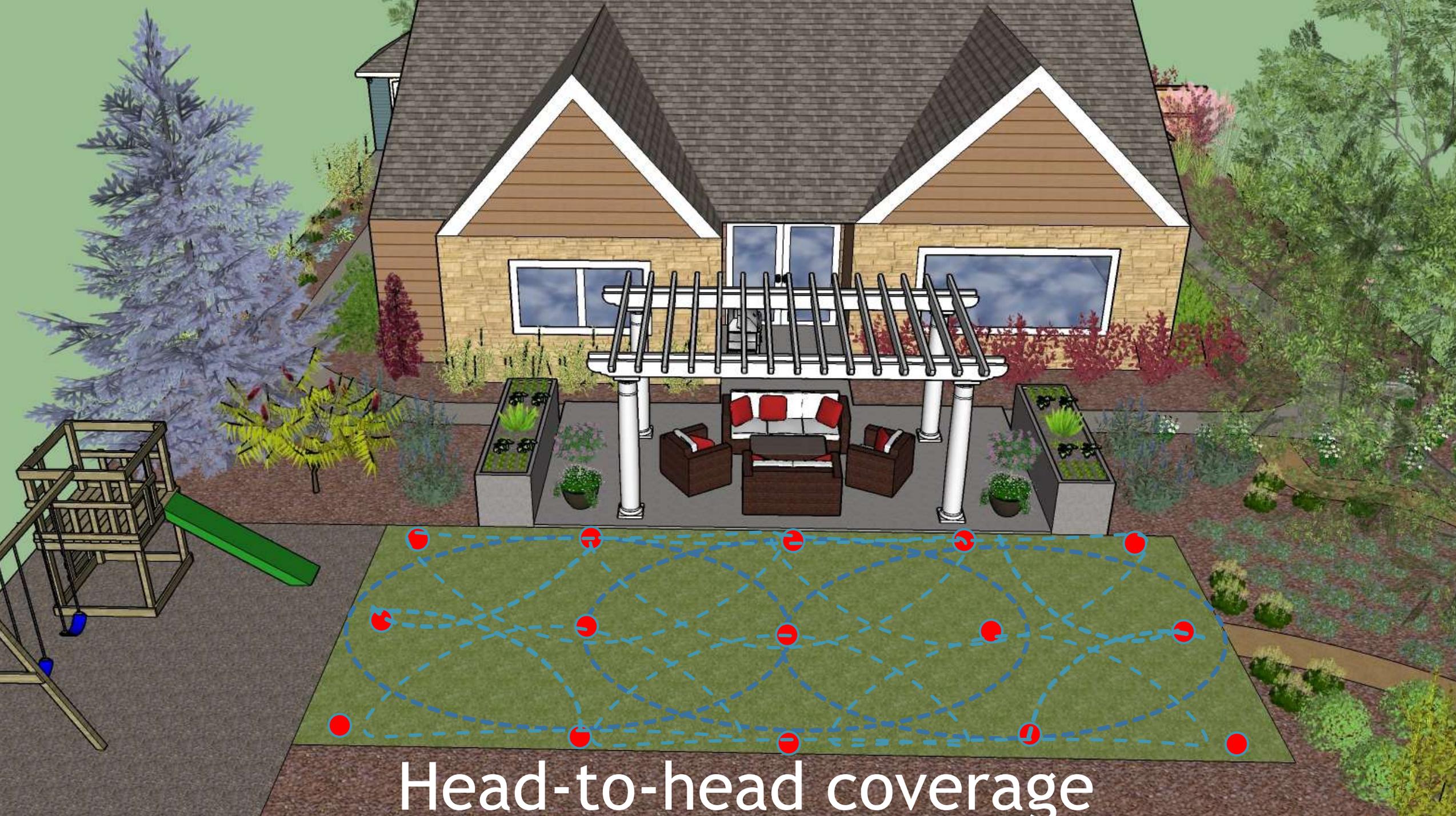


Swing joints

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



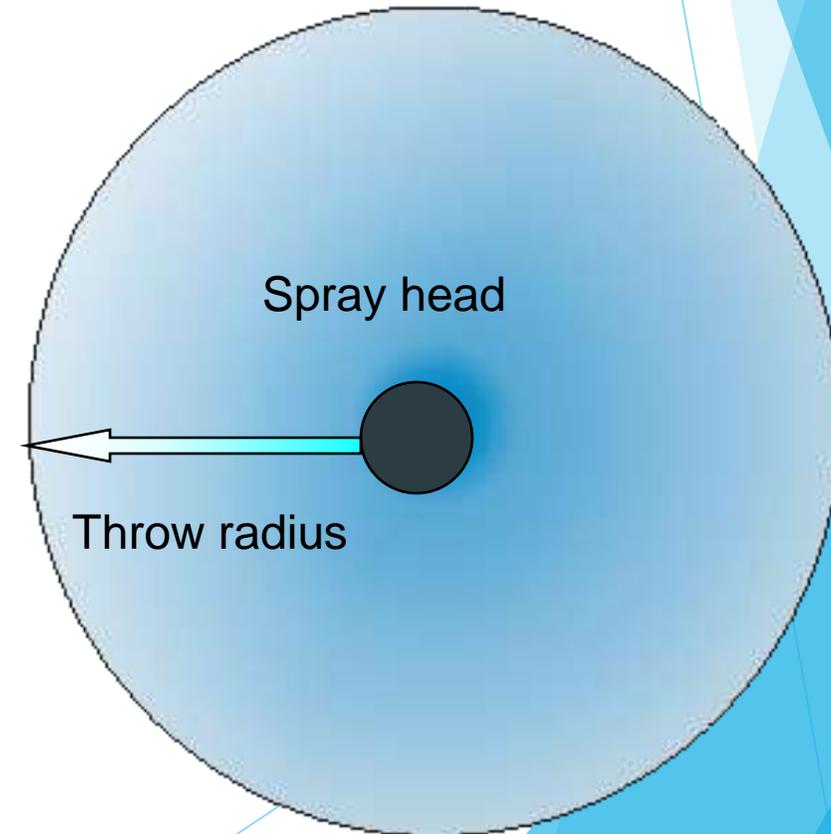
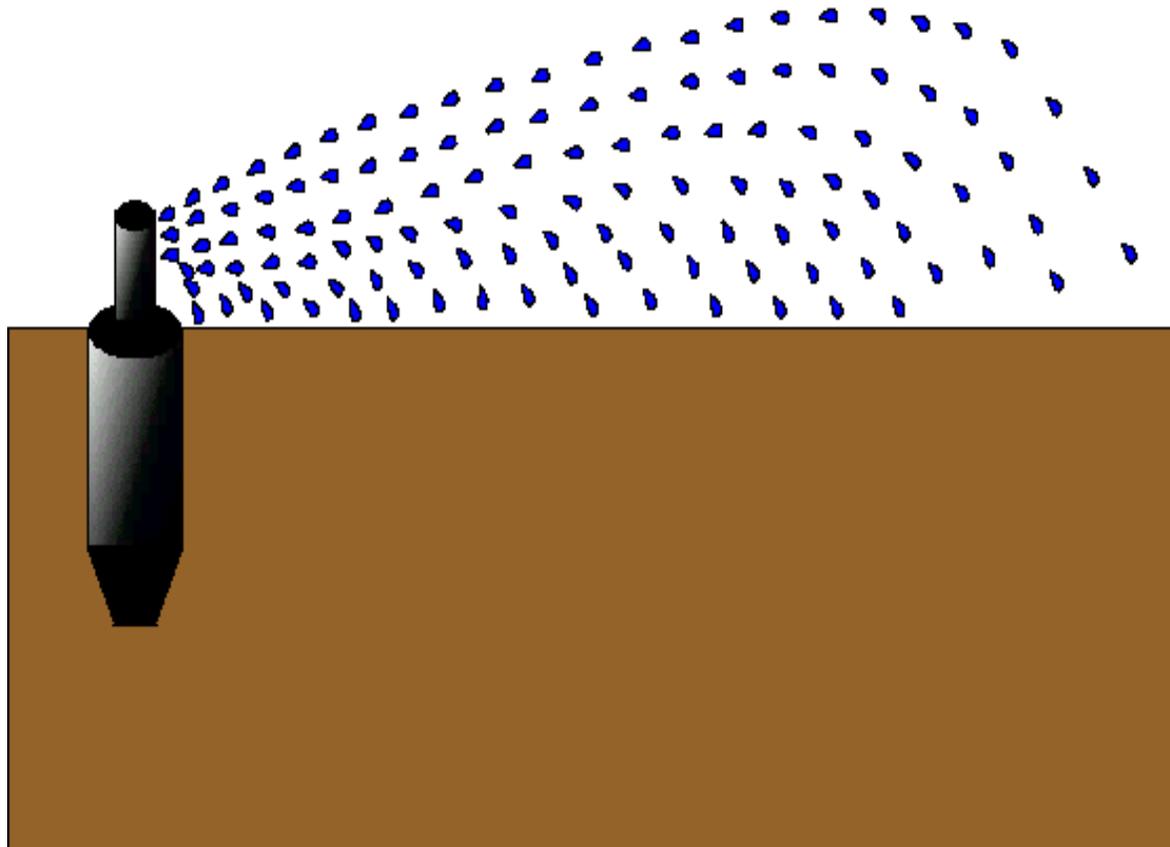




Head-to-head coverage

Irrigation Design

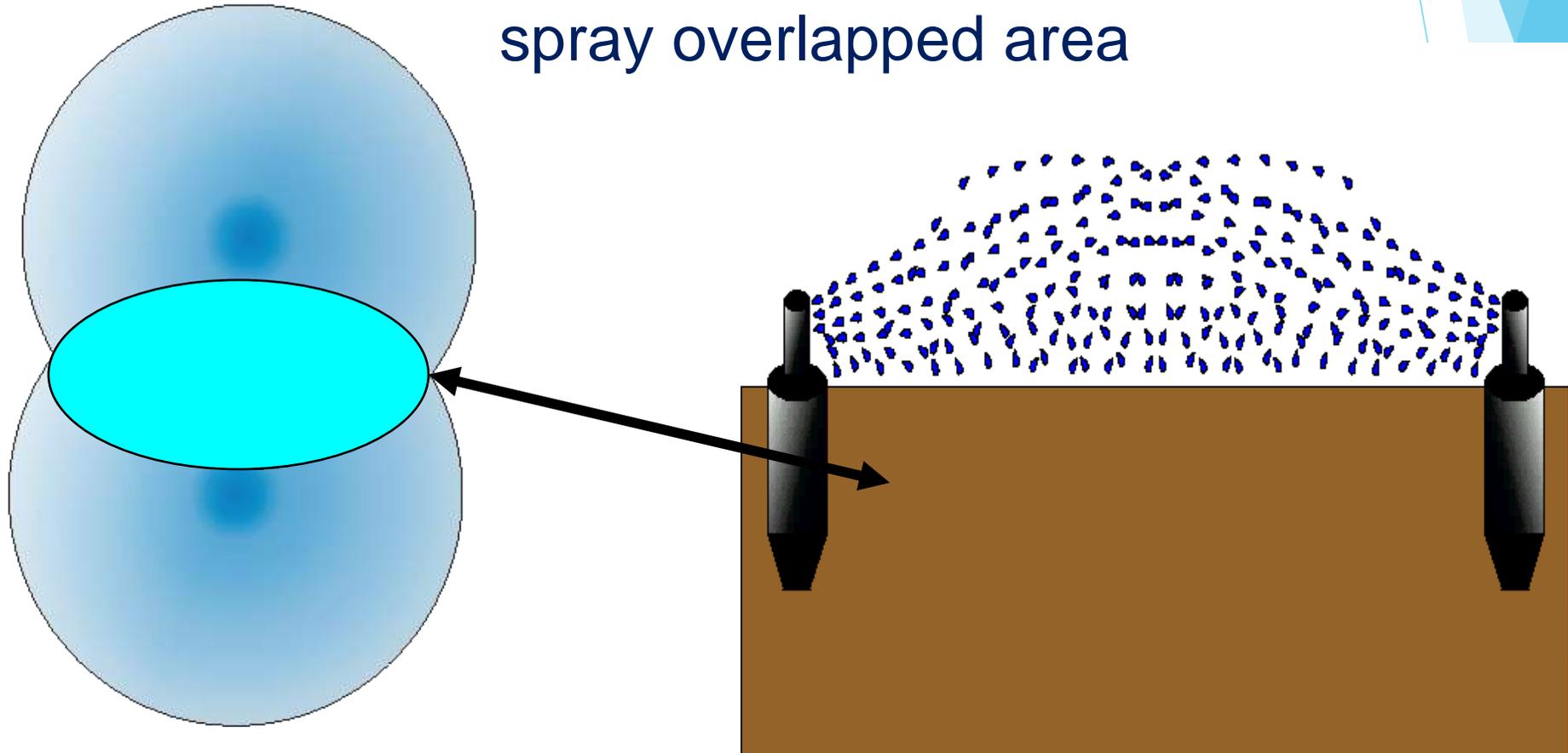
- ▶ Single sprinkler heads have non-uniform coverage
- ▶ Spray heads apply less water the farther away from the head



Irrigation Design

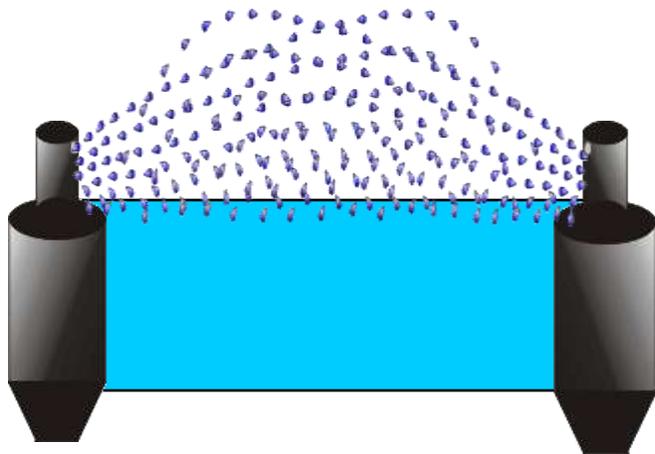
- ▶ Sprinklers: need to achieve overlap coverage to emulate rainfall
- ▶ They are designed to overlap the spray pattern

Precipitation (application) rate calculated from spray overlapped area

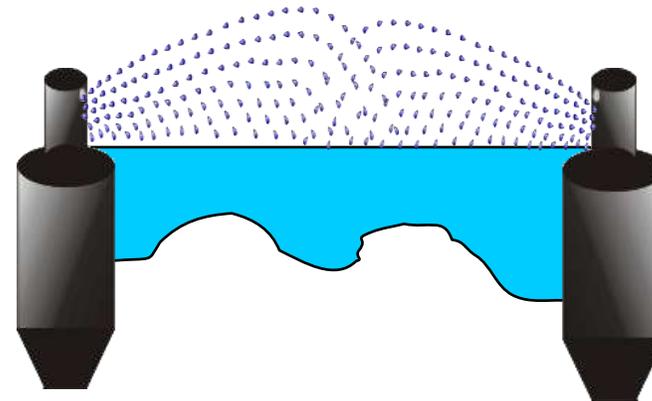


Irrigation Design

- ▶ Pressure below the specified range results in poor coverage



Coverage within
specified pressure
range



Coverage when
below specified
pressure range

System Operation



Best watering practices/standards

Lawn is always
watered
separately
from other
plants.



Flower Bed Best Practices

Planting beds are always watered with drip irrigation.



Watering Best Practices

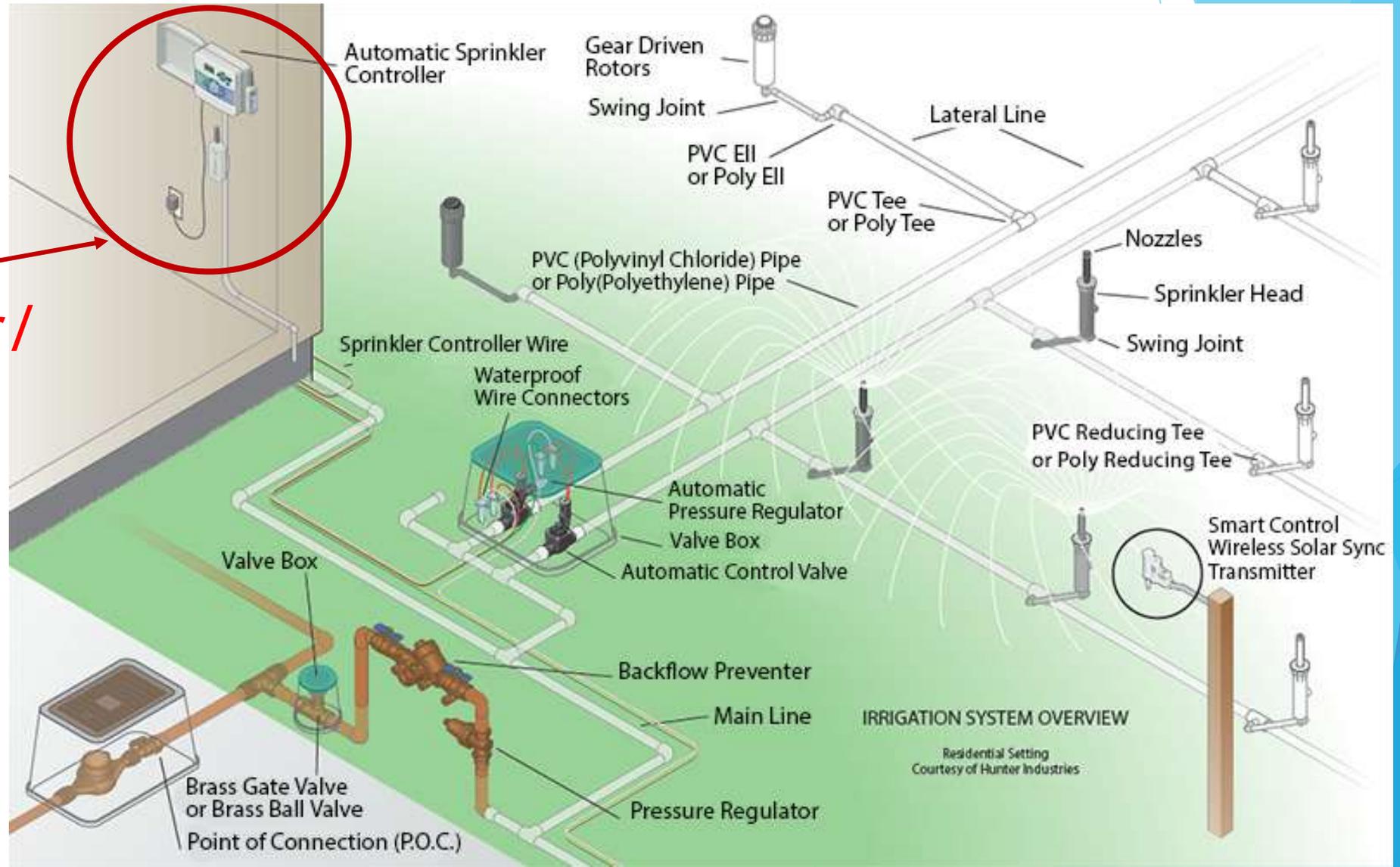


Use only one type of irrigation per zone. Don't mix spray and drip lines on same zone.



Anatomy of a sprinkler system

Controller/
Timer



How do traditional controllers work?

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



Programs in the Controllers

- ▶ Most controllers have multiple Programs
- ▶ A, B, C, D
- ▶ Use programs to help you water plant material correctly (time and frequency)

- Ex.
- Program A for lawn
- Program B for Veggies
- Program C for Flower Beds

- Program A for Rotors
- Program B for Fixed Spray
- Program C for Drip Line
- Program D for Veggie Garden

Determining Frequency and Run Time

Run Times:

This is variable based on the following:

- Soil Type (holding and draining)
- Nozzle type - Rate of application
- Uniformity of sprinkler head placement

- You want to apply .5 inch of water each time you irrigate. This could take 10 minutes or up to 90 minutes.
 - Fill your soil reservoir (This won't change once you figure it out).

Frequency:

To determine frequency you need to monitor your site and see how long it takes to drain your soil reservoir

This will change through the season.

Depending on soil types and how much water you apply, generally you would not need to water more than 3 times per week in the heat of summer (there are exceptions)

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.



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



Smart Technology still needs user input

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



Smart Controller Rebate Program

Receive a \$100 rebate for EPA WaterSense certified smart controllers that run on weather or soil moisture based operation.

Apply at www.utahwatersavers.com



Irrigate Efficiently Summary

Proper irrigation saves water and results in healthier more drought resistant plants and happy neighbors 😊.

Apply the proper amount of water and only when needed

Understand different water requirements for different areas of the landscape- Hydro-zones

Program the system in response to changing seasonal variations in temperature and rain.

Be aware and monitor your sprinkler system and make adjustments as needed to get a good uniform application. Fix and repair your system to limit water waste. Take responsibility.

Questions ?

- 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.



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