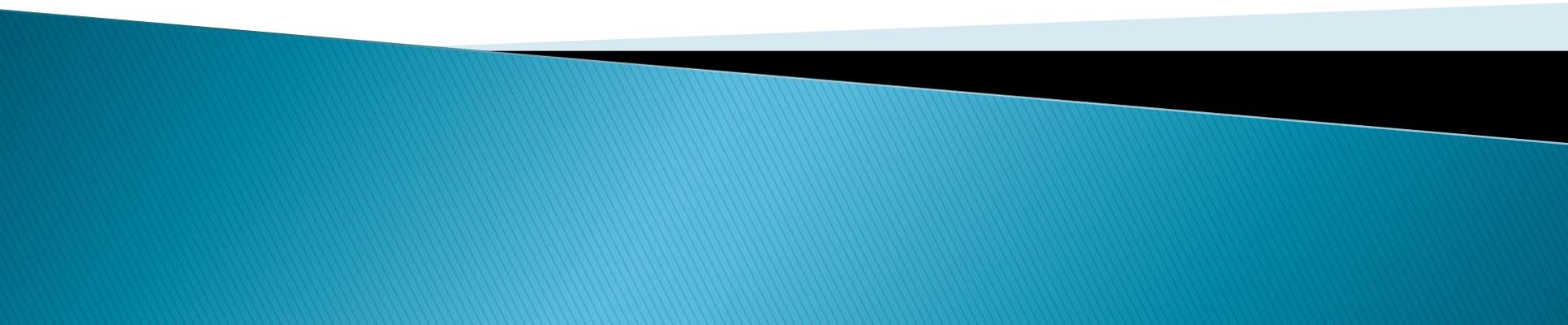


Drip System Maintenance

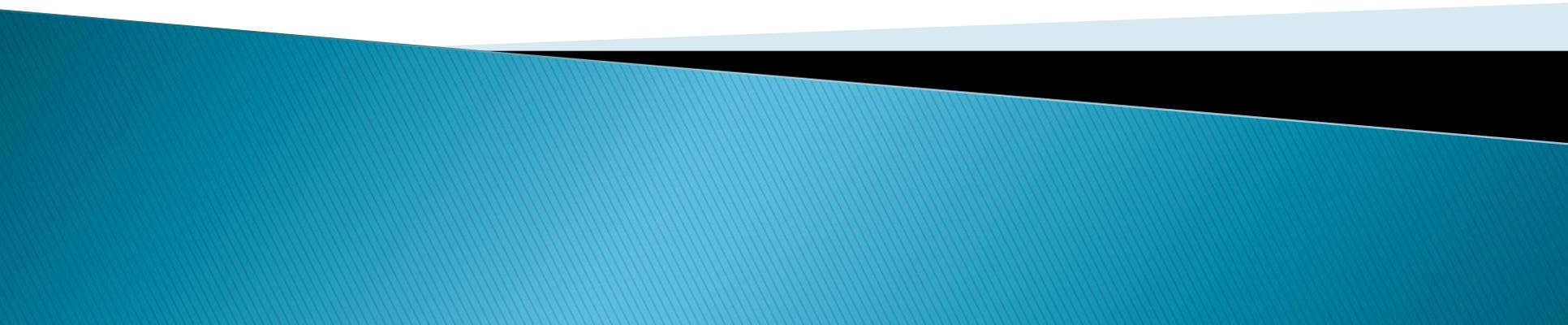


Tony Roth

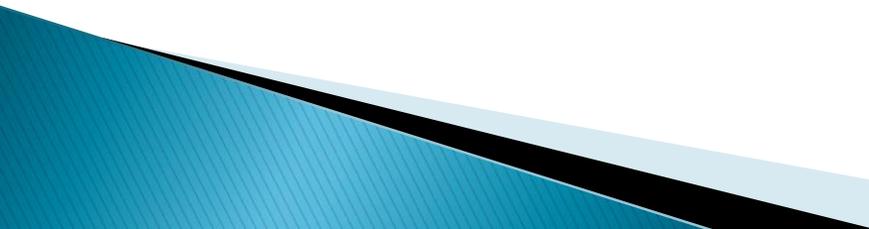
tony@gslong.com

- ▶ Crop Consultant at G.S. Long Yakima– 18 years
 - ▶ Mainly Hops and Wine Grapes
 - ▶ Have been consulting on drip irrigation for 20+ years in tree and vine
 - ▶ Fortunate to have been involved in drip and micro-irrigation as they have grown in our area
 - ▶ The California Tour
- 

Safety First!!



Use good fertigation & safety practices

- ▶ Use proper backflow devices
 - ▶ Use good environmental stewardship
 - ▶ Clean, effective pump station area
 - ▶ Have Injection Pumps interlocked with the irrigation pump
 - ▶ Water on site
 - ▶ Have proper labeling on all materials
 - ▶ Proper system hardware in place
 - ▶ Keep good records on everything you do
- 

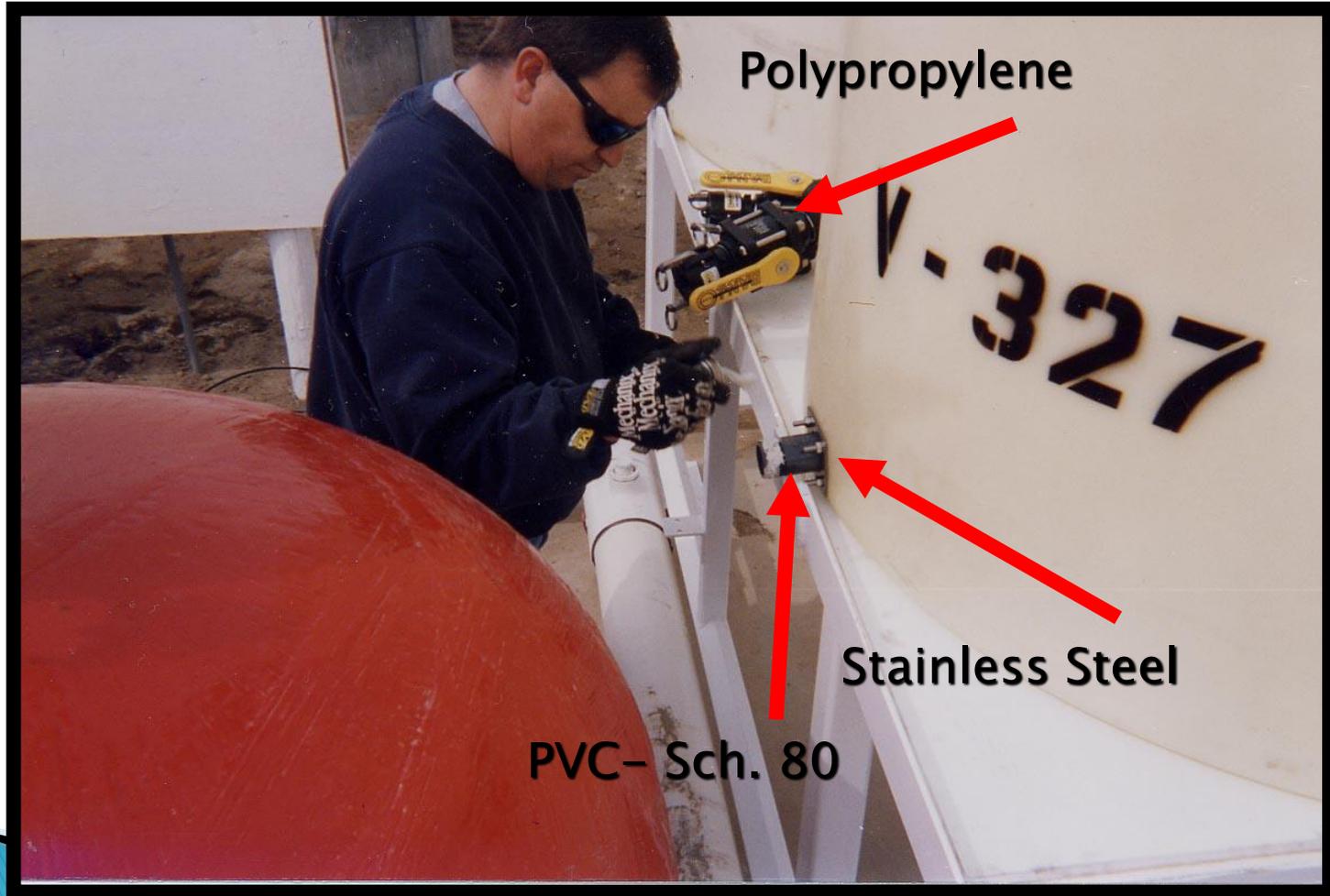
Use proper materials for injection

- ▶ Never, ever use mild steel, nylon, or brass
 - ▶ Use Polypropylene or stainless steel. PVC okay in most situations too
 - ▶ Use proper hoses and valves
 - ▶ Know the products you are working with
- 





Use proper materials for injection



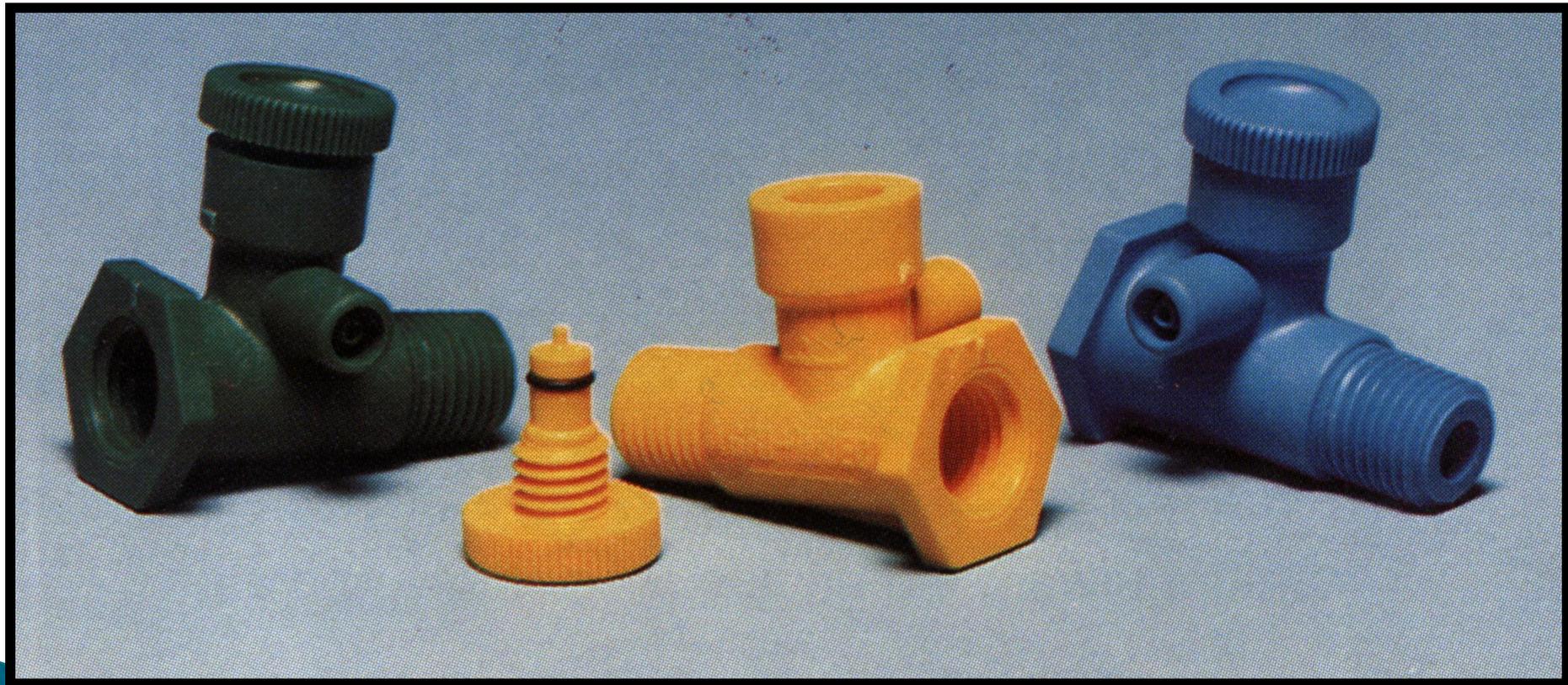
Injection Check valves

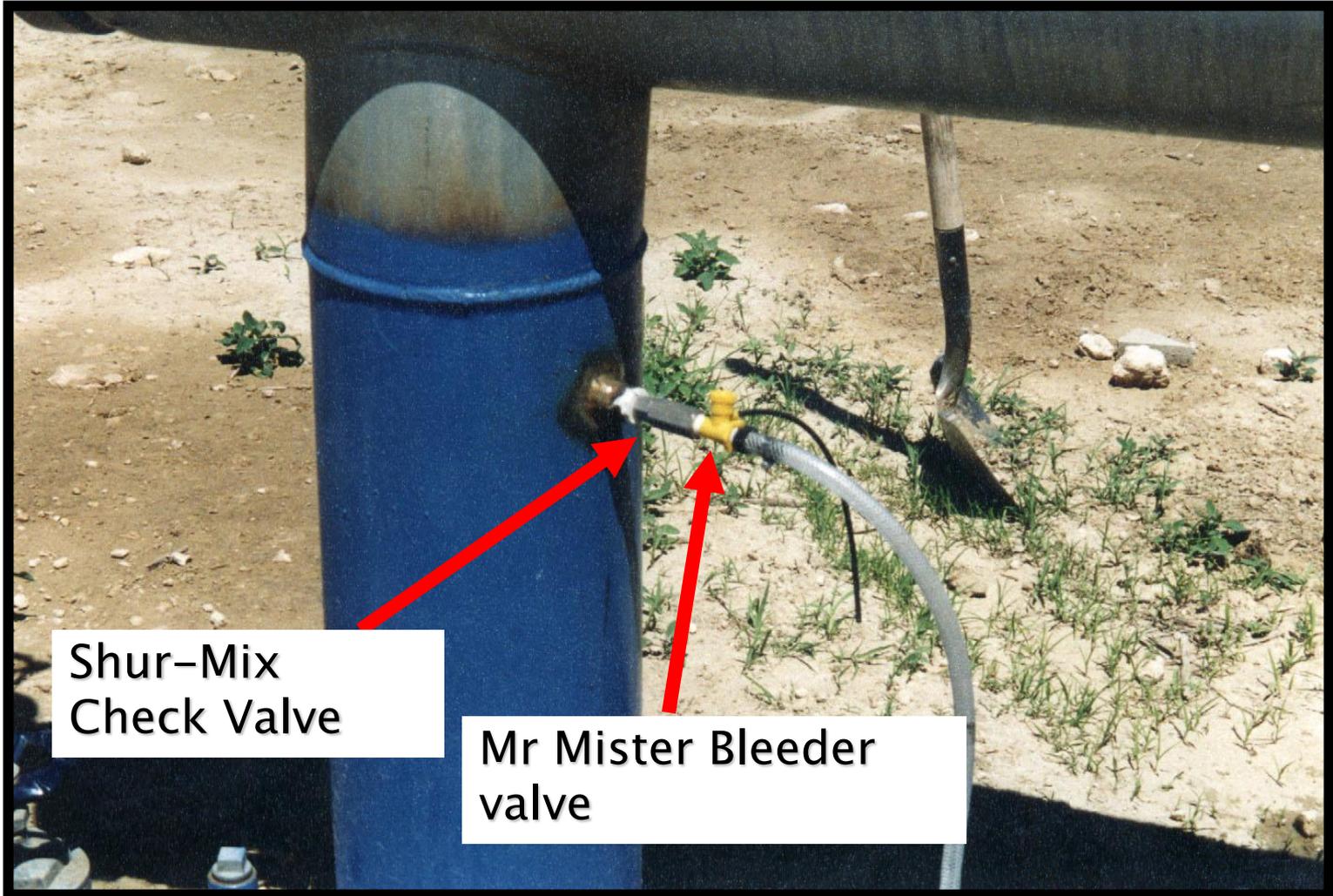
- ▶ First line of defense
 - ▶ Helps disperse product evenly into the stream of water
 - ▶ Product being injected will help decide location within the system
- 



Mr. Mister

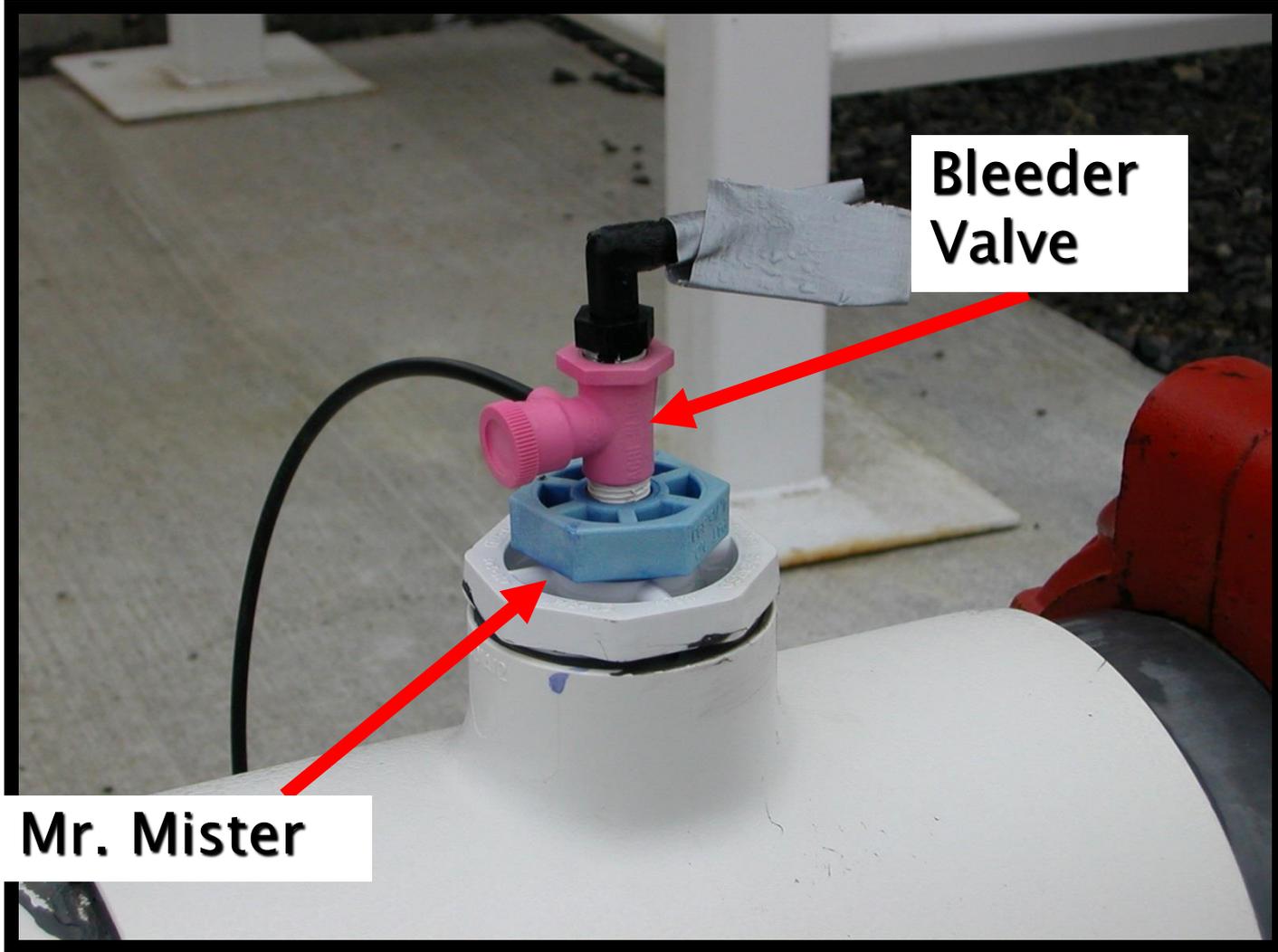
Bleeder Valves





Shur-Mix
Check Valve

Mr Mister Bleeder
valve



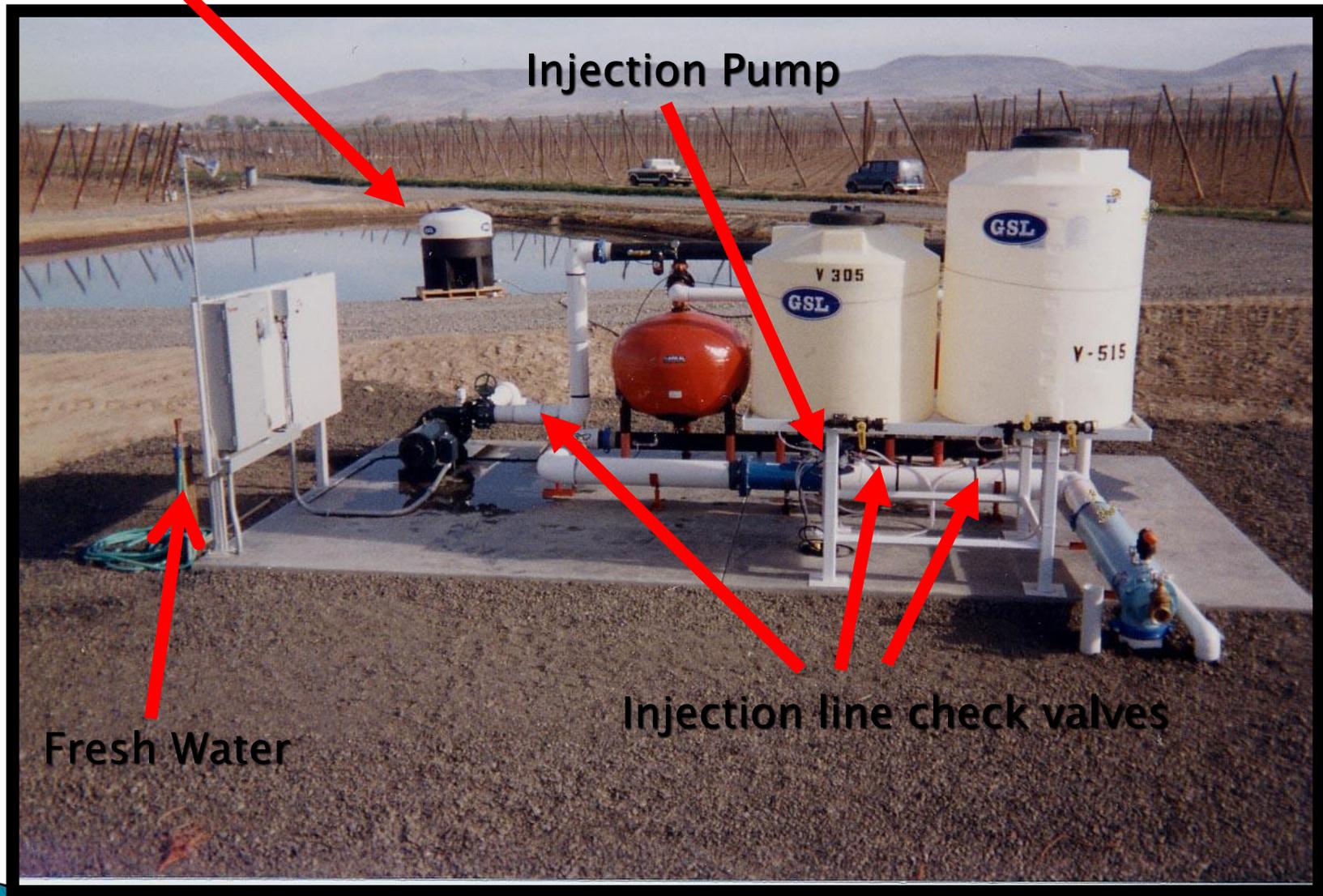
**Bleeder
Valve**

Mr. Mister

**We Need to be The Stewards for
Safety and Good Environmental
Stewardship**



Gypsum applicator



Injection Pump

Fresh Water

Injection line check valves

Drip System Maintenance

- ▶ Just because an emitter is dripping doesn't mean it is dripping at the correct volume
 - ▶ Program must be customized to the water qualities and to the anticipated problems
 - ▶ Surface or subsurface?
- 

Water Quality Considerations

- ▶ Water quality is one of the first things that should be evaluated
 - ▶ Well or surface water?
 - ▶ pH
 - ▶ Carbonate and Bicarbonate
- 

pH of the water

- ▶ pH is the driving force behind problems
 - ▶ pH under 7.0 -- lower potential for problems
 - ▶ 7.0 – 8.0 -- moderate potential for trouble
 - ▶ Above 8.0 -- potential for severe problems
- 

Bicarbonate levels

- ▶ Hopefully Bicarbonate levels are under 100 PPM
 - ▶ Above 150 PPM potential plugging due to calcium carbonate buildup on emitters
 - ▶ When both pH and bicarbonate levels are high the problem will be increased
 - ▶ Well water has the highest levels
 - ▶ Acids will help
 - ▶ Sequestering materials will help too
- 

Iron

- ▶ Total iron content should be under 1.5 PPM
- ▶ Iron levels higher will cause iron precipitate

Algae and Bacterial slime

- ▶ Depends on weather conditions
 - ▶ Light and temperature have an impact
 - ▶ Depends on your water source
 - ▶ Chlorine and or acids will help with control
- 

Fine Silt

- ▶ Silt combined with Algae will cause an increased problem

So,

what do we do about these
problems?

Fine Silt

- ▶ This is a tough one
 - ▶ Must have good filtration
 - ▶ Good water velocity when end flushing the hoses
 - ▶ Chlorine will help when algae and silt are a problem
- 

Acids

- ▶ Good on calcium carbonate
 - ▶ Fair on algae
 - ▶ Fair on Iron
 - ▶ No effect on silt
- 

Acids

- ▶ On subsurface systems you must be more aggressive
 - ▶ It is always a good idea to establish a titration curve to help with rates
 - ▶ Take the pH of the irrigation water down between 3.0 – 5.0.
 - ▶ Be careful of incompatible hardware in the system
- 

Chlorine

- ▶ Good on algae control
 - ▶ Liquid is the most common
 - ▶ You must watch the Calcium Levels in your Water Source
 - ▶ pH of the Water Plays an Important Part
 - ▶ Rates–
- 

Chorine Injection Formula

- ▶ $\frac{K \times (\text{PPM Desired}) \times (\text{System Flow})}{\text{Concentration}}$ %
- ▶ $K = .006$
- ▶ $\text{PPM Desired} = (2-25 \text{ PPM})$
- ▶ $\text{System Flow in GPM}$
- ▶ $\% \text{ Concentration} = 12.5\% \text{ (Liquid)}$

Example-

- ▶ We want 10 PPM Chlorine in a system that is running 650 GPM.
- ▶ $.006 \times 10 \text{ (PPM)} \times 650 \text{ (GPM)} = 39$
- ▶ $39 \div 12.5 \text{ (% Concentration of Liquid)} = 3.12$
- ▶ Inject 3.12 GPH to achieve a 10 PPM Concentration

Chlorine and Acid injection simultaneously

- ▶ NEVER, EVER mix the 2 together or inject them at the same port
- ▶ Low rates of chlorine is very effective at water pH under 6.0

Drip-A-Tron

- ▶ A nice option for smaller systems, packaged in 5 gallon containers
 - ▶ Good on mineral deposits
 - ▶ Good on micro-sprinklers
 - ▶ Mix 10-1 with water
 - ▶ Inject this solution at the rate of 4-8 oz. per acre per hour for 5-6 hours
 - ▶ Turn system off and let solution stand overnight in the system
 - ▶ Flush the following day
- 

Drip System Maintenance cont.-

- ▶ Know the potential problems
 - ▶ Your program should be tailored to your system
 - ▶ Before doing something you are unsure of, ask your consultant
 - ▶ Keep good maintenance records
 - ▶ A clean system is an efficient system
 - ▶ Safety
- 

Questions?

Tony Roth
G.S. Long Co.

Thank You Very Much For Your Time!