

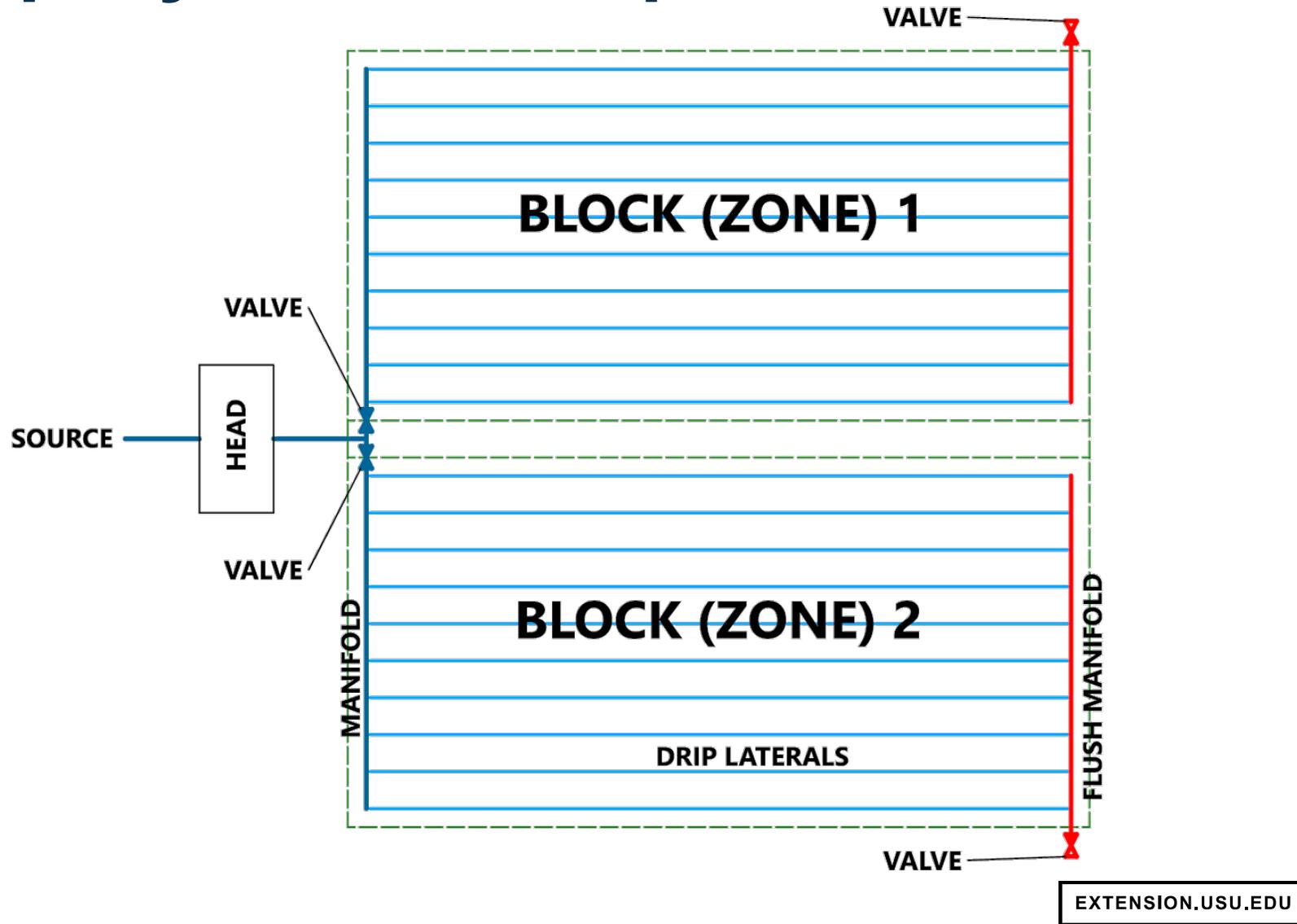
Small Plot Drip Irrigation Design

11th Annual Urban and Small Farms Conference, February 21, 2023

Burdette Barker, Extension Irrigation Specialist



Drip System Components



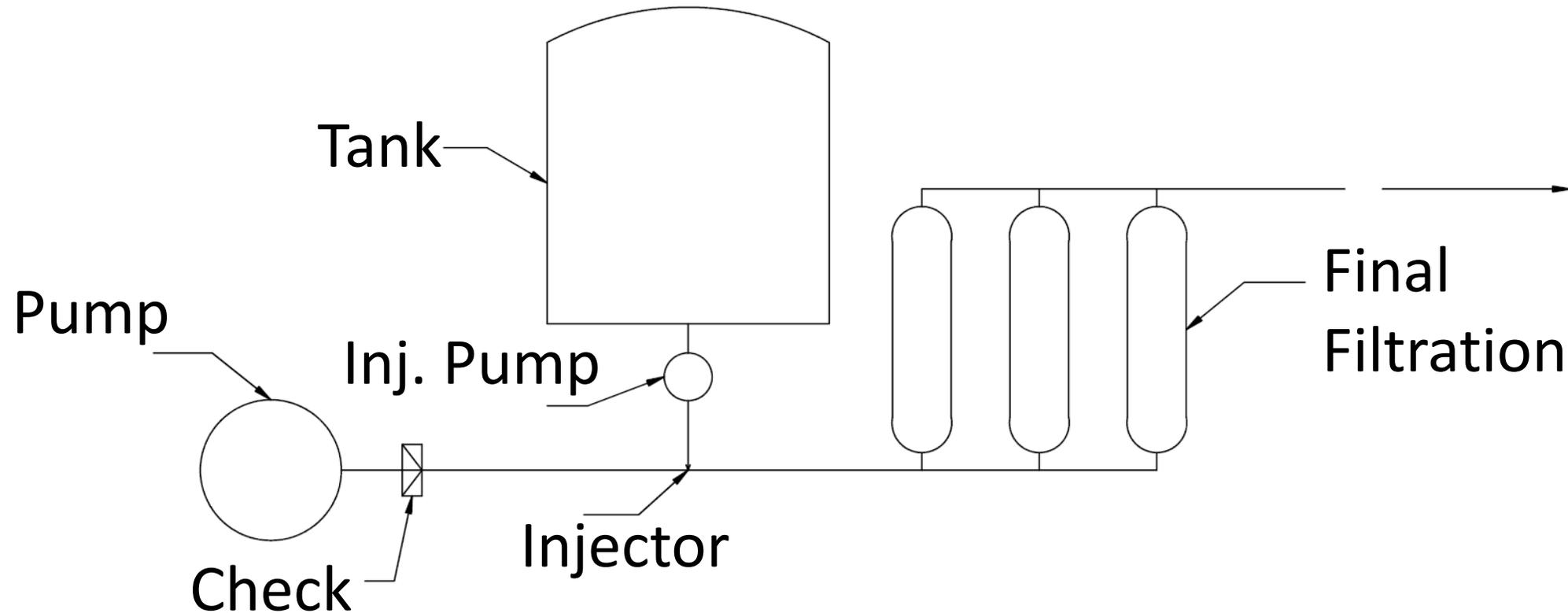
Drip Emitters



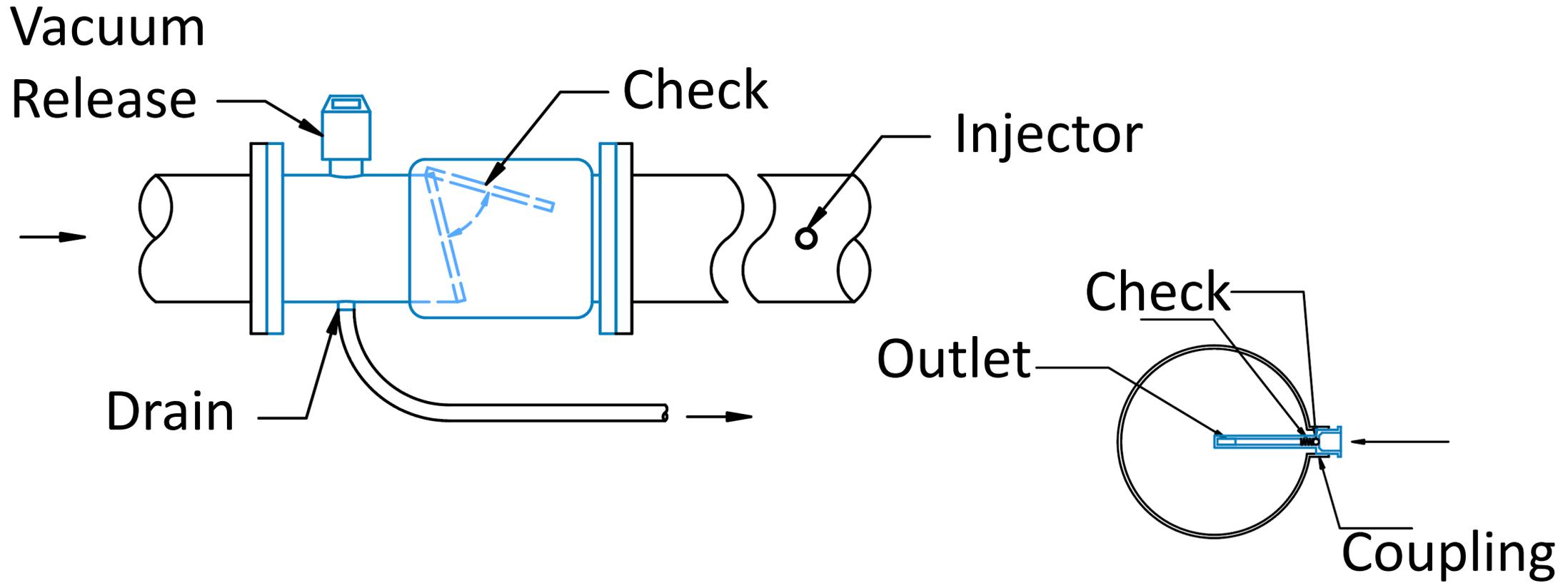
Drip Line and Drip Tape



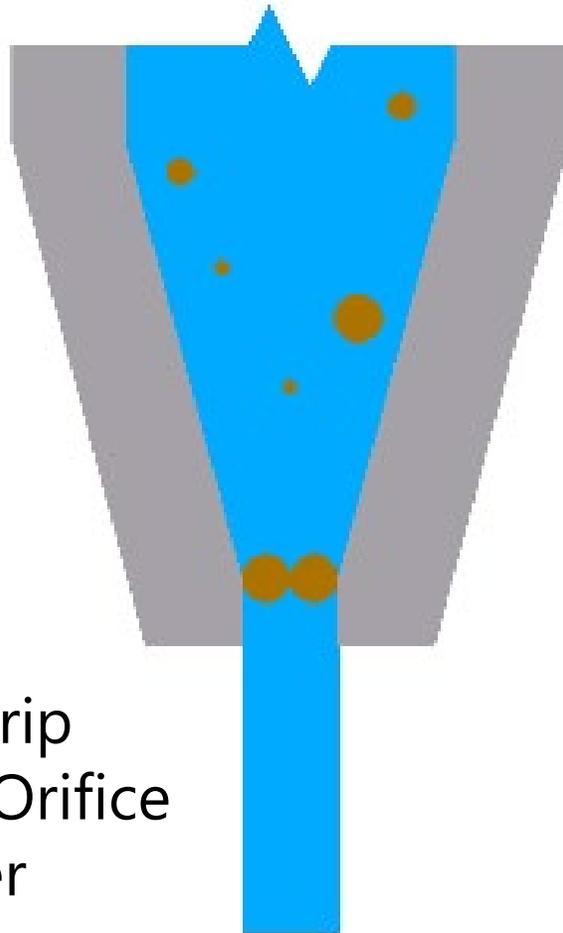
Chemigation



Chemigation



Filtration



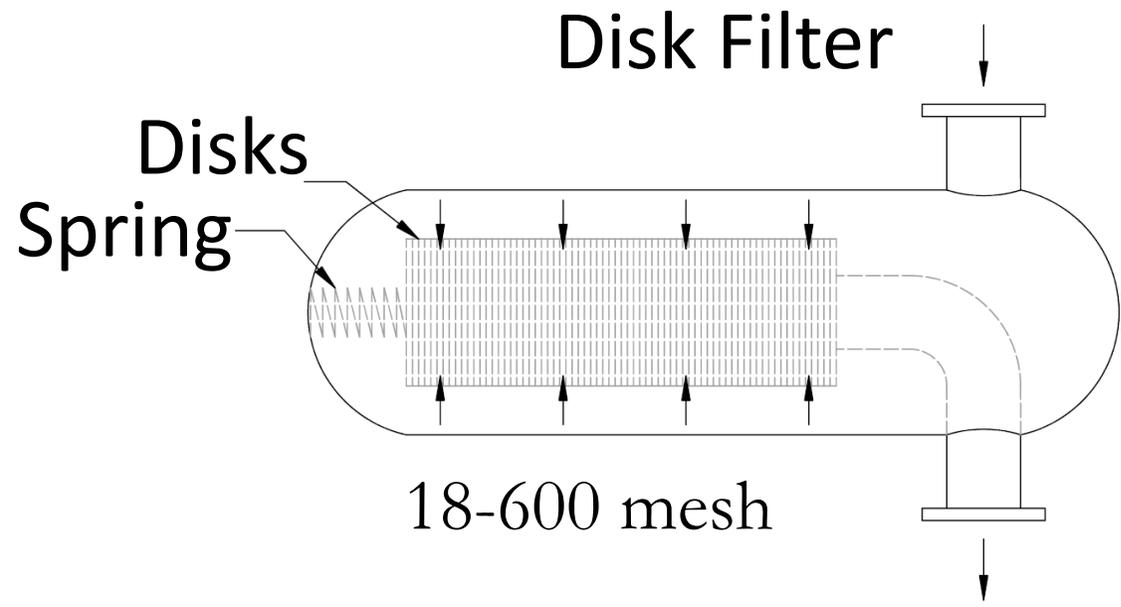
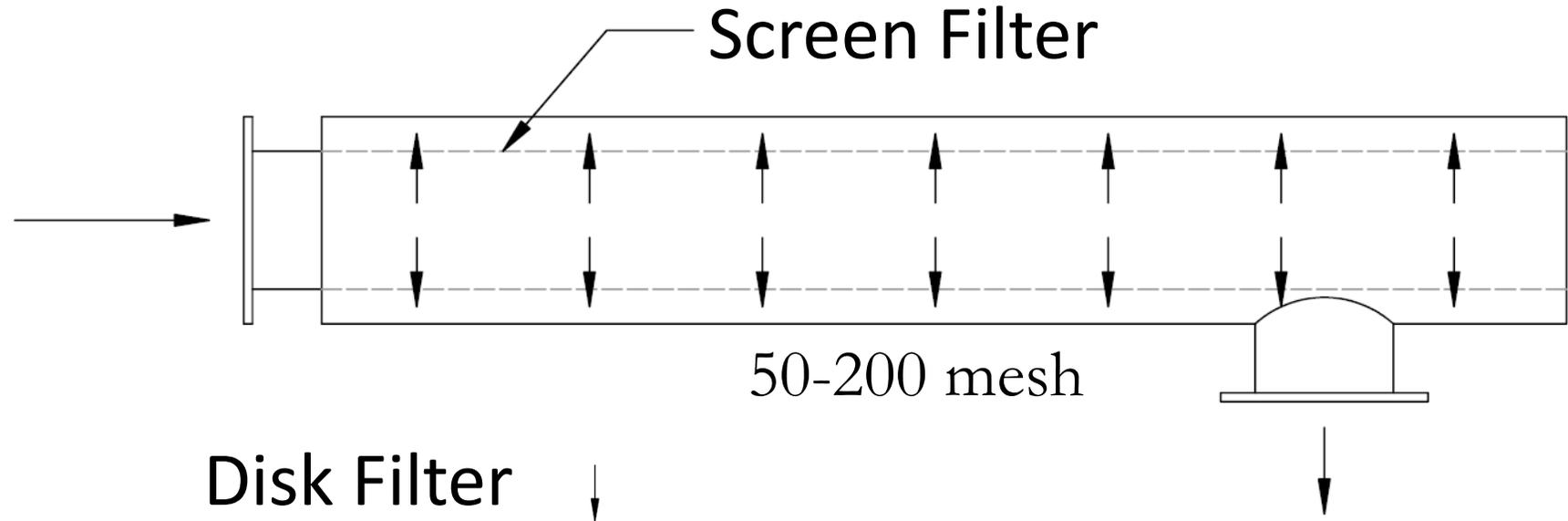
1/10th Drip
Emitter Orifice
Diameter

Mesh Size	Opening Size	
	Inches	mm
5	0.1181	3
10	0.0591	1.5
20	0.0280	0.711
40	0.0165	0.420
80	0.0071	0.180
100	0.0060	0.152
120	0.0049	0.125
140	0.0042	0.105
150	0.0039	0.100
180	0.0035	0.089
200	0.0030	0.074
270	0.0021	0.053
300	0.0020	0.050
325	0.0017	0.044
600	0.0010	0.025

Source: Table 7-18 in NRCS (2013)



Filter Types

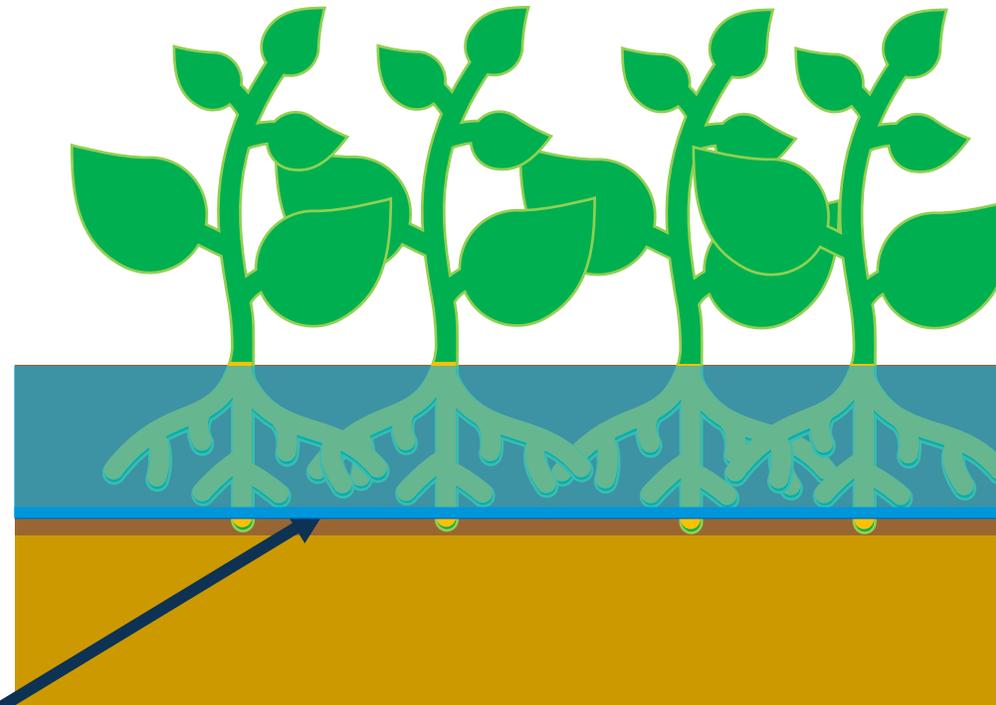


Filter Types



The Goal

Uniform Irrigation → Each Plant Has Equal Access to Water



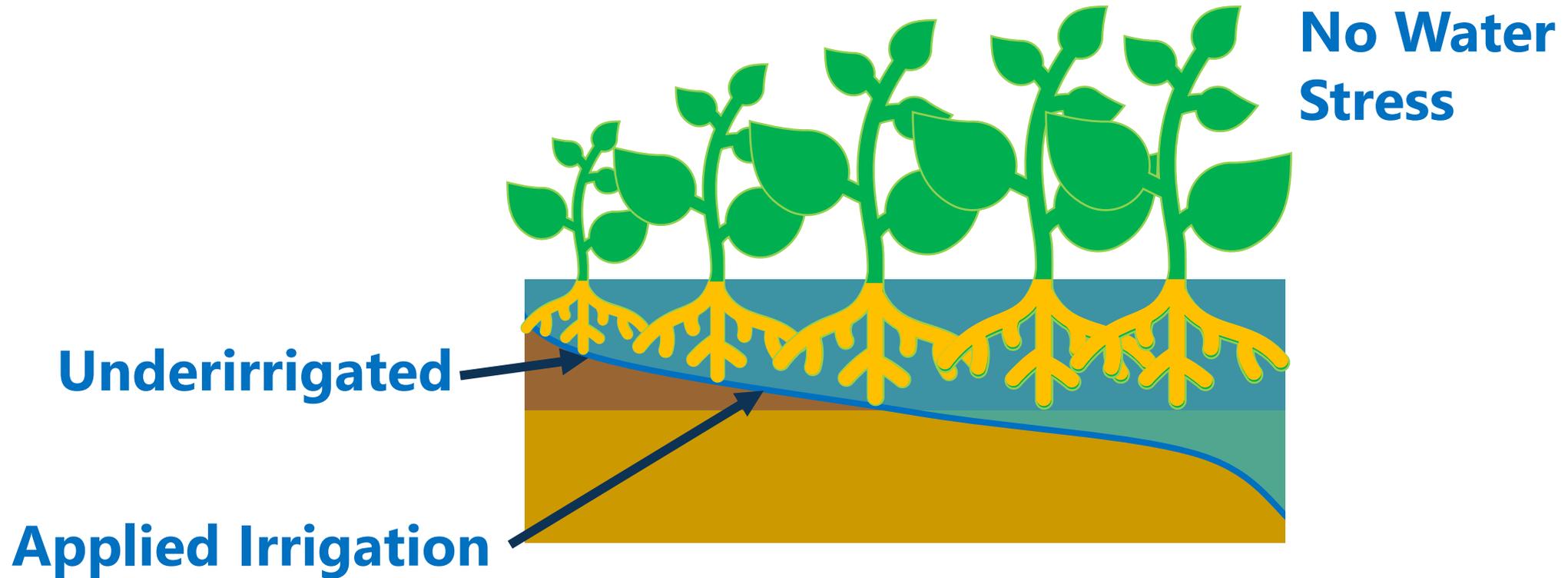
No Water Stress

Applied Irrigation



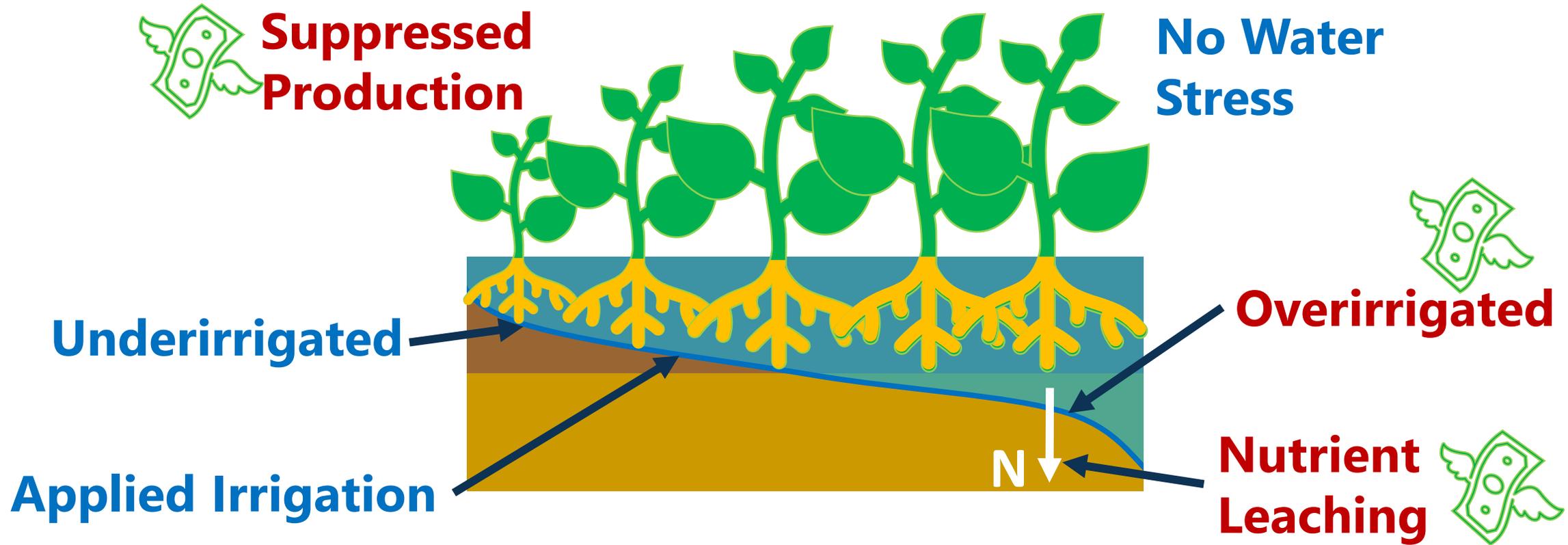
The Reality

Non-Uniform Irrigation



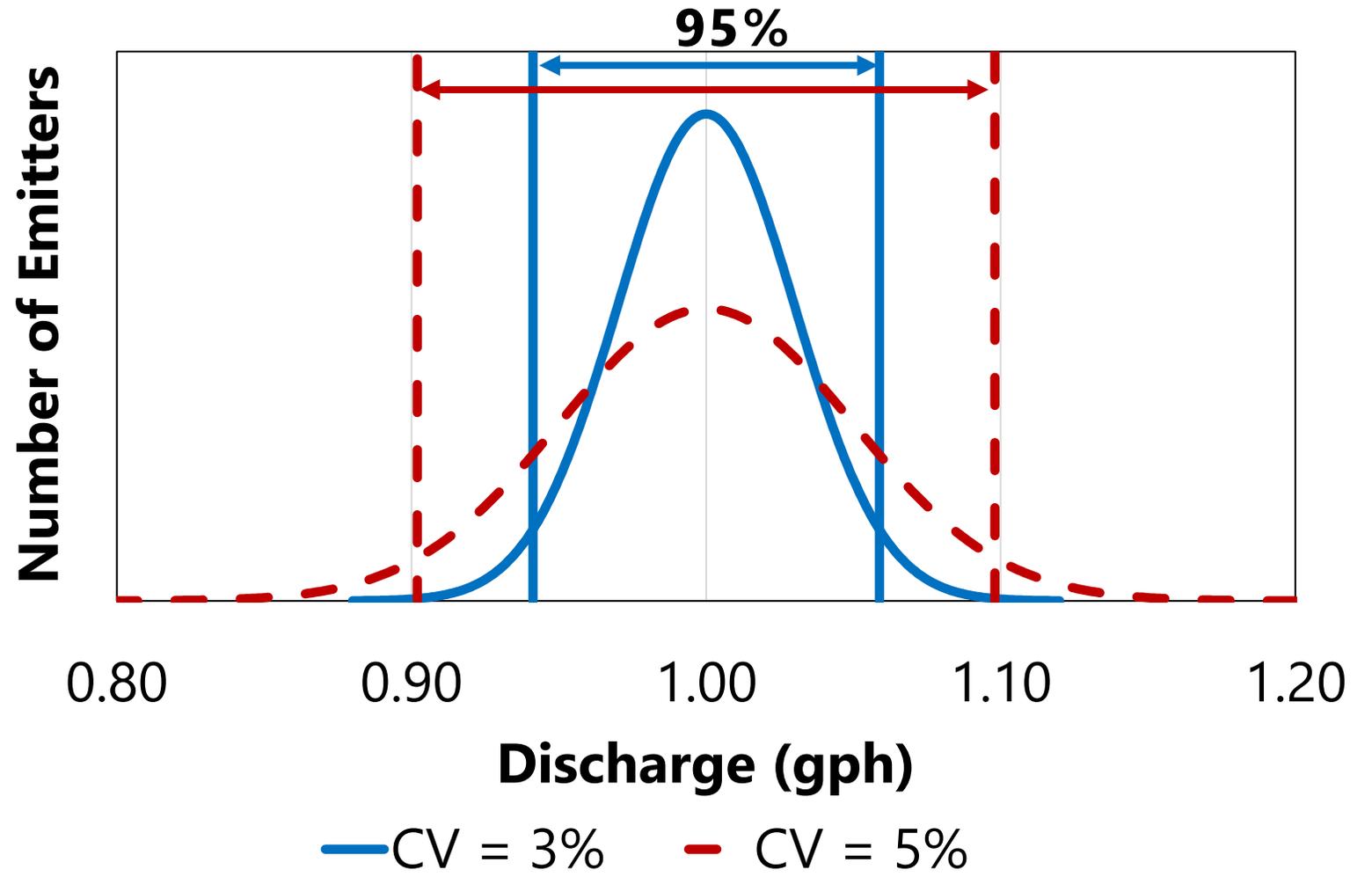
The Reality

Irrigation Uniformity is Money, But it Costs Money Too...



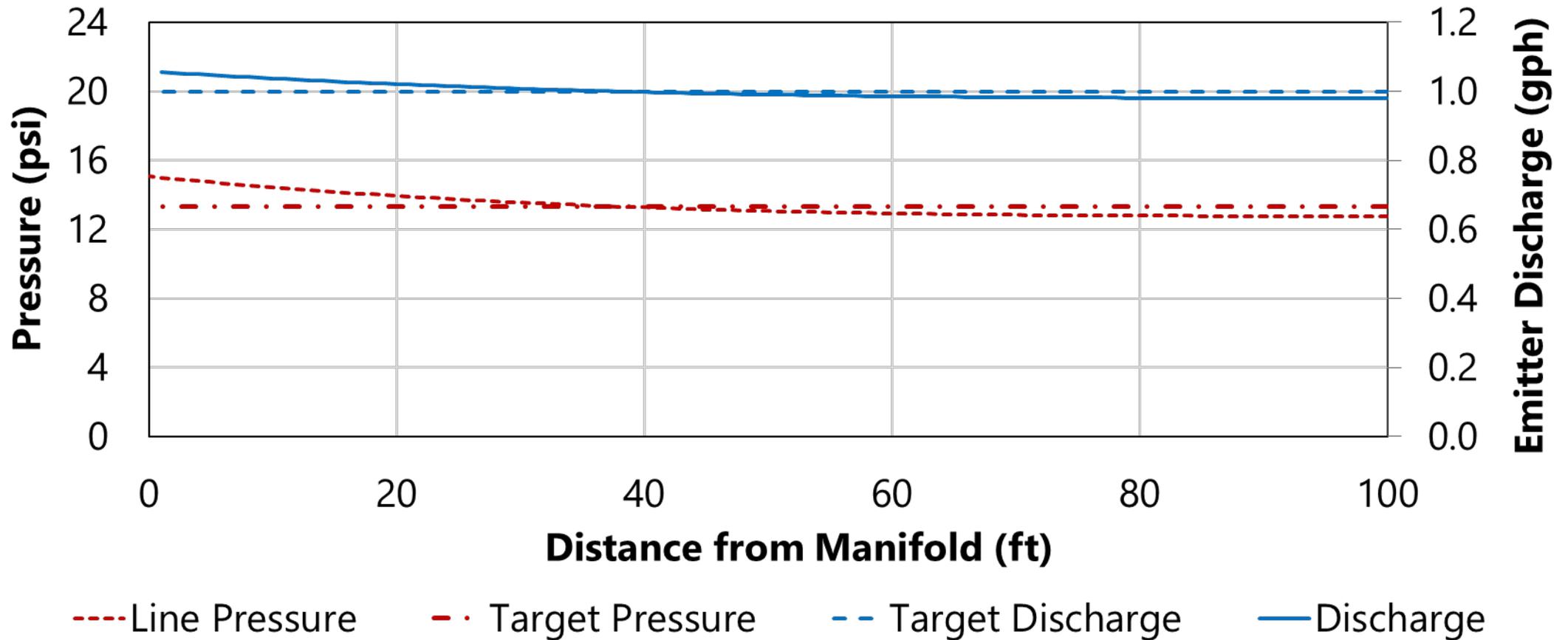
Causes of Non-Uniformity...

Emitter Variation



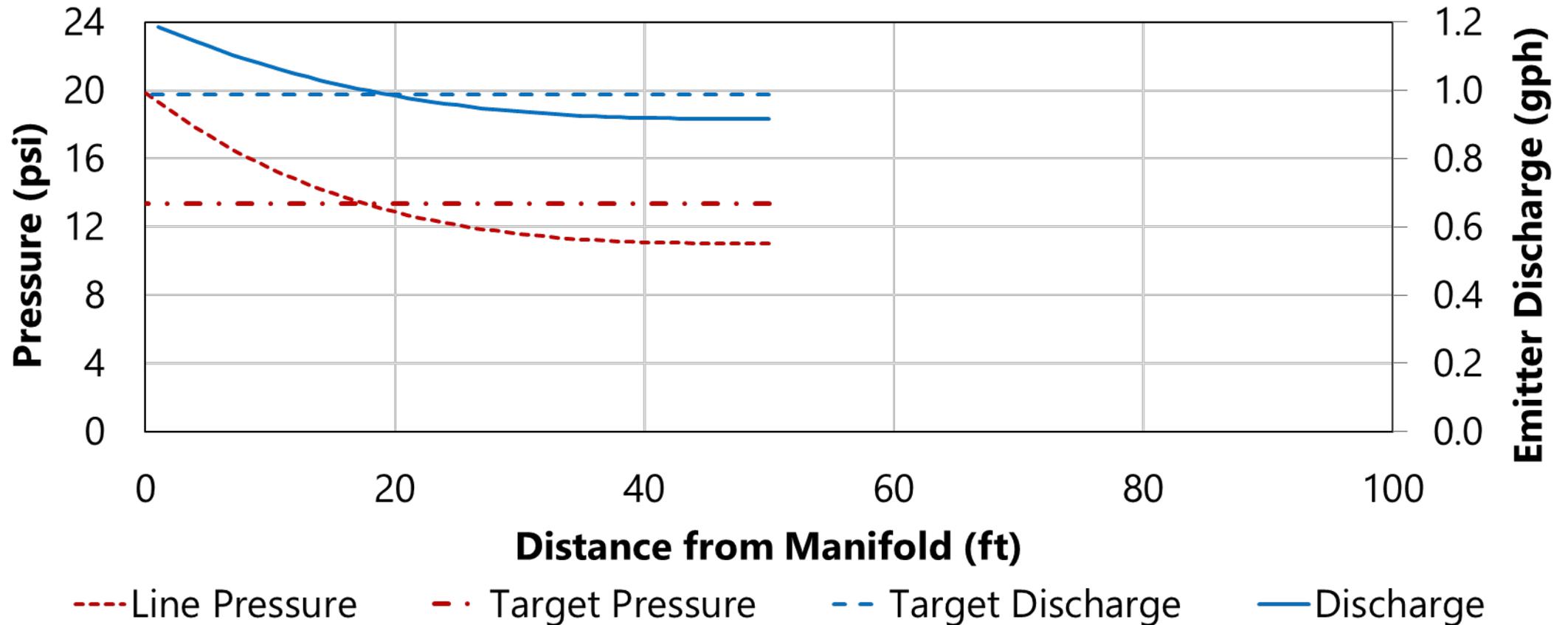
Causes of Non-Uniformity

Pressure Variation → 1 gph/ft – ½” Tubing



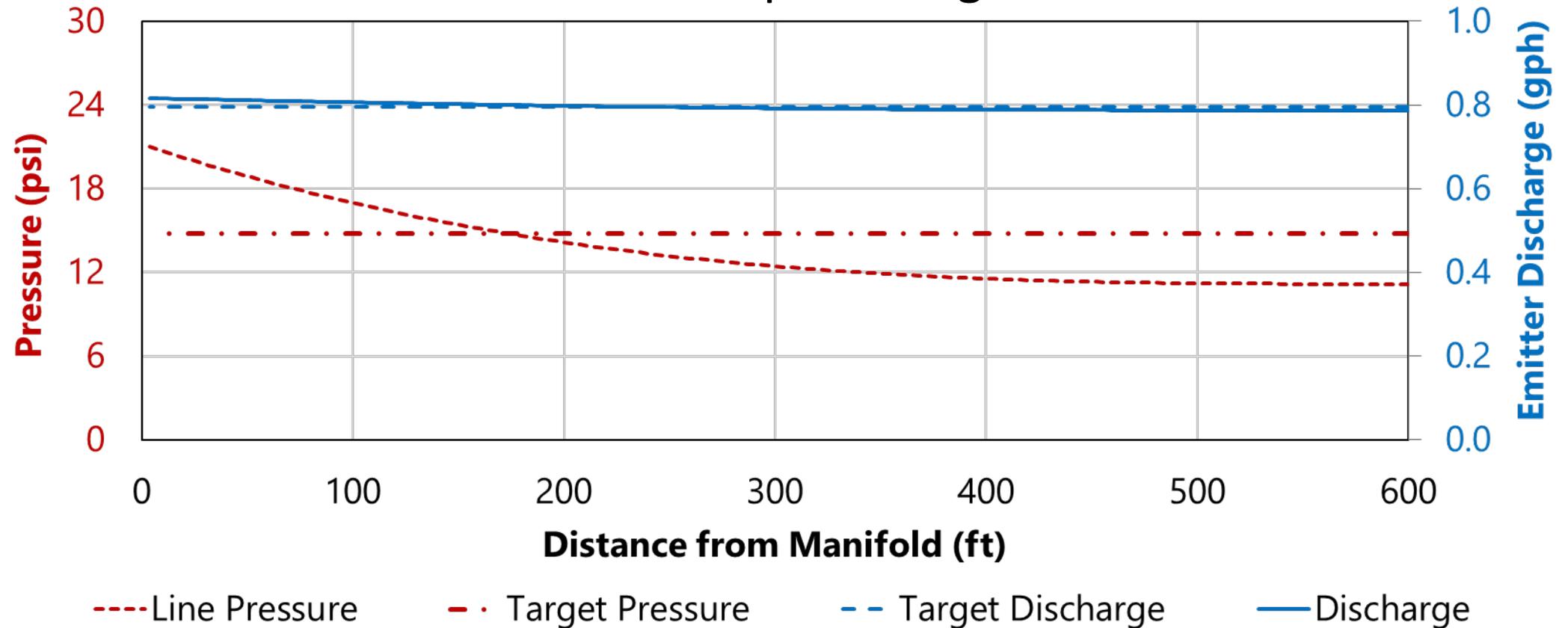
Causes of Non-Uniformity

Pressure Variation → 1 gph/ft – ¼" Tubing



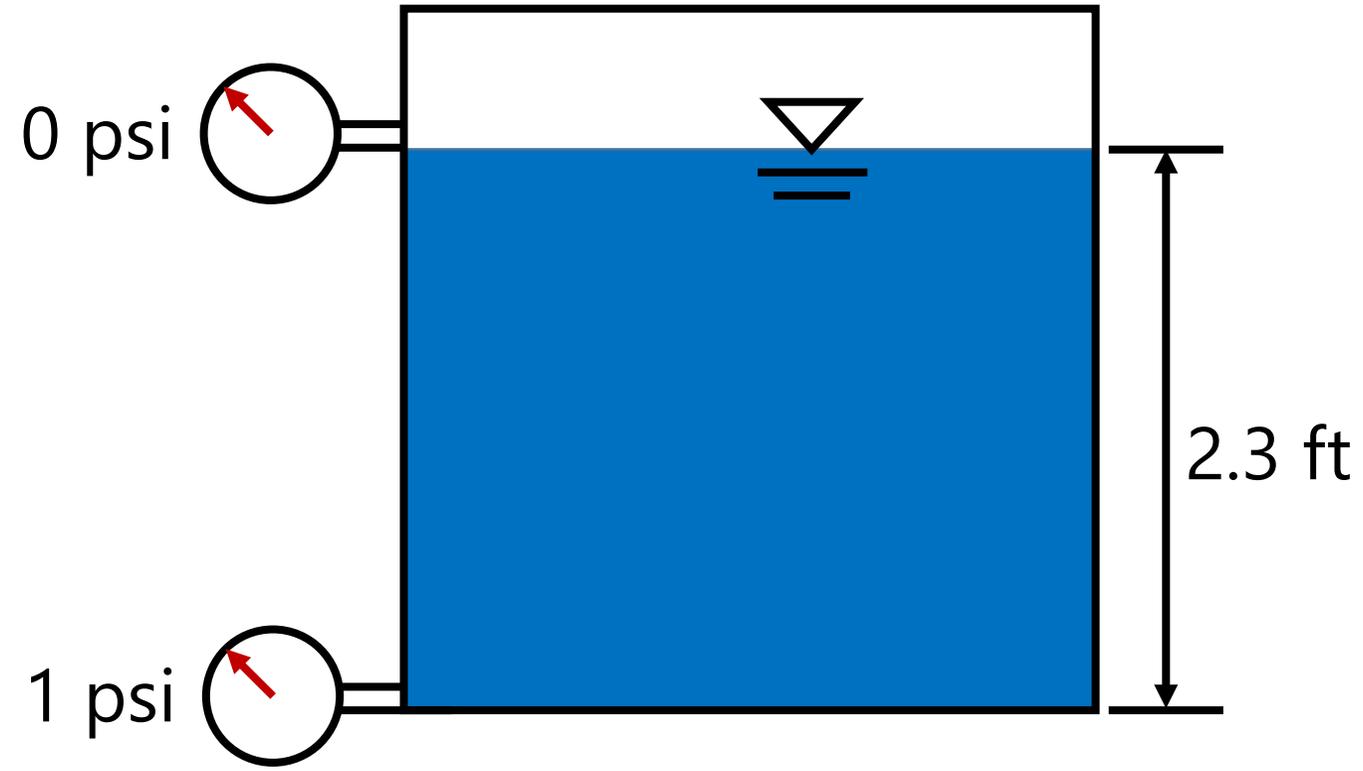
Causes of Non-Uniformity

Pressure Variation – Pressure Compensating Emitters



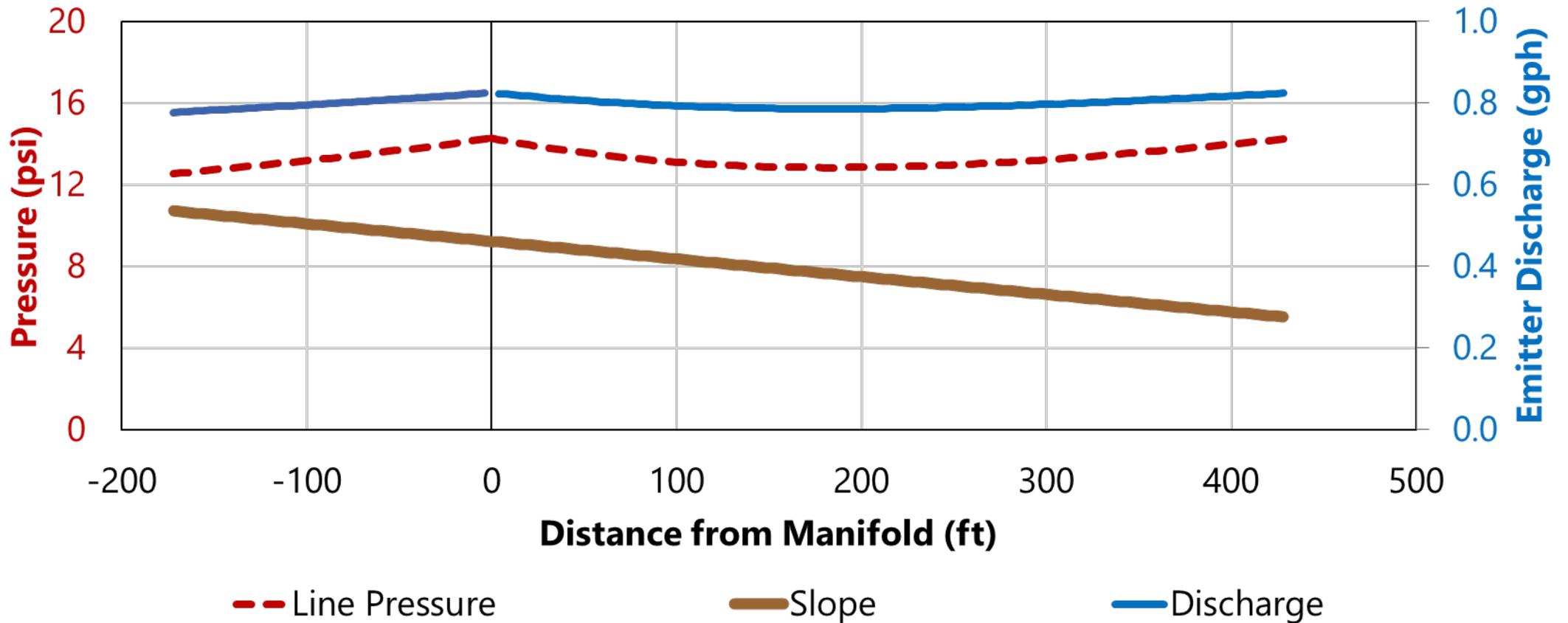
Causes of Non-Uniformity

Pressure Variation – Terrain



Causes of Non-Uniformity

Pressure Variation – Terrain



PVC Pipe Sizes

Size (in)	Type	Flow at 5 fps (gpm)
1/2	Sch 40	4.5
3/4	Sch 40	8.0
1	Sch 40	13
1 1/4	Sch 40	23
1 1/2	Sch 40	31
2	Sch 40	51
3	100 psi IPS	135
4	100 psi IPS	223
6	100 psi IPS	483
8	100 psi IPS	819
10	100 psi IPS	1,272



Flow Measurement



Water Measurement and Conveyance

Resources for irrigation water flow measurement and canals and other water conveyance systems.

White Papers

[Pipe Flow Measurement for Irrigation](#)

Fact Sheets and Web Articles

On This Page

[White Papers](#)

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[Other Resources](#)



energy and protect and extend the life of irrigation pumps and motors. VFD economics will be highly dependent on the conditions on each field or set of fields. Considering the complete costs of ...

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[White Papers](#)

[Fact Sheets and Web Articles](#)

[Other Resources](#)

Other Resources

[Idaho Department of Water Resources Approved Flow Meters \(Tested by Utah Water Research Laboratory at USU\)](#)

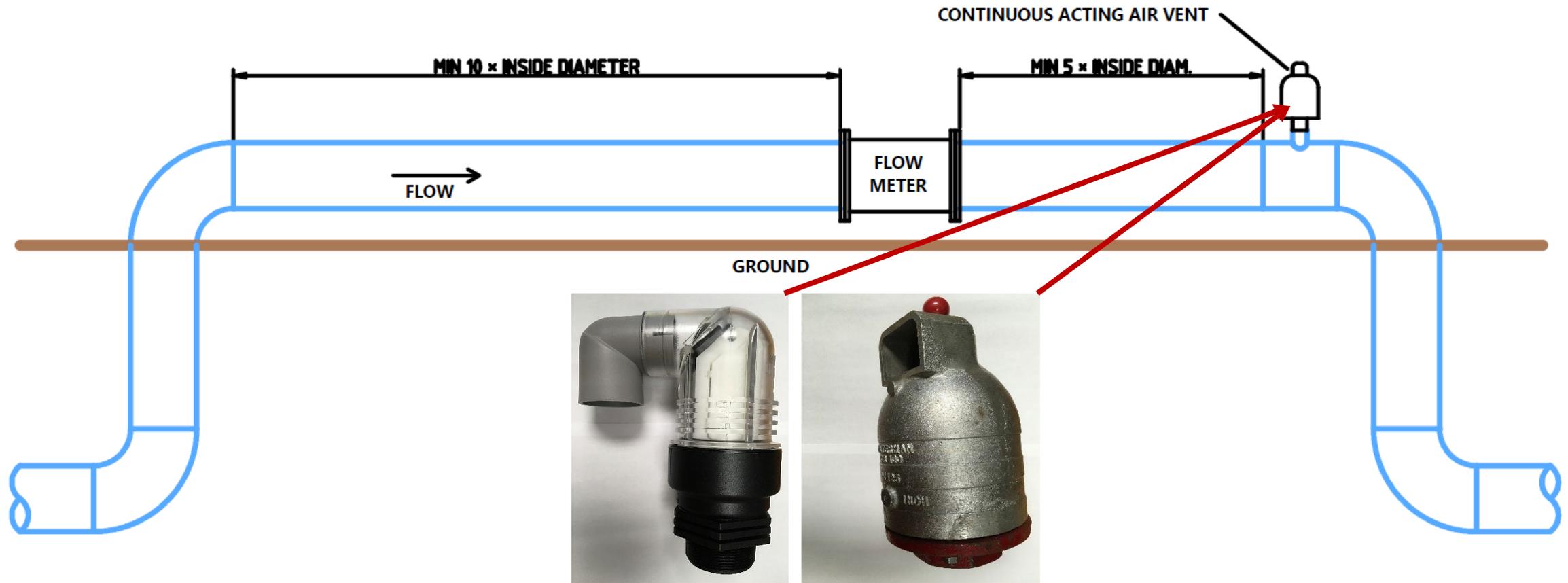
[Multi-State Extension Surface Irrigation Information](#)

[USU Extension Drought Page](#)

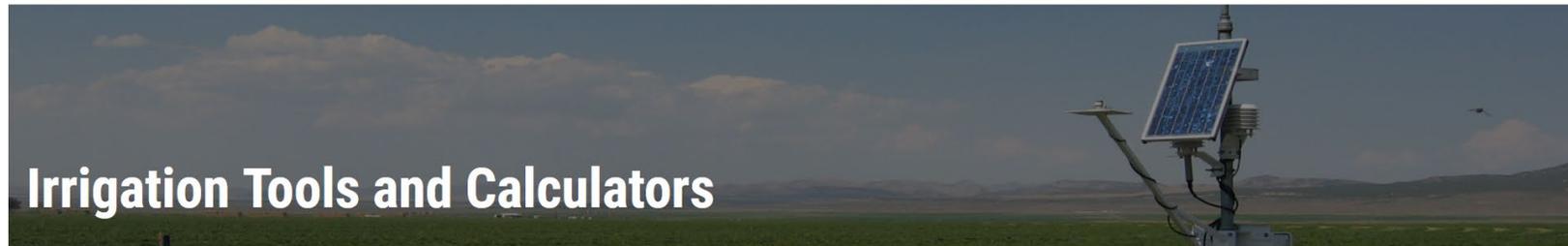
[Texas A&M Article About Canal Lining Performance](#)

[U.S. Bureau of Reclamation PVC Venturi Meters](#)

Flow Measurement Accuracy



Resources



Web applications and tools for irrigation management, irrigation calculations, and irrigation decision support.

Irrigation Optimization Support Tool

[Irrigation Technology Cost/Benefit Analysis Calculator](#)

Web-based decision support tool developed by USU Extension Crops and Washington State University experts for estimating the benefits and costs of agricultural irrigation water management and equipment optimization improvements.

Irrigation Management Tools

[Irrigation Scheduler Mobile](#)

Web-based irrigation scheduling tool developed by Washington State University. USU agricultural and orchard electronic weather stations have been added to the tool for collection. The tool requires the user to create an AgWeatherNet (AWN) ID.

On This Page

[Irrigation Optimization Support Tool](#)

[Irrigation Management Tools](#)

[Other Resources](#)

Drip Irrigation Rates

Water Recommendations for Vegetables



<https://extension.usu.edu/yardandgarden/research/water-recommendations-for-vegetables>

Events

Tuesday, February 21, 2023

Utah State University Extension
Master Gardener Program

Join us virtually for The Utah State University Extension Master Gardener Program; a great way to pa... more »

Wednesday, February 22, 2023

Walk & Talk - Pruning Principles

Walk through our orchard while learning the basics for pruning your own fruit trees with the USU Bot... more »

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