Irrigation Management of Strawberries

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Acknowledgements

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Monterey County RCD: Paul Robins, Michael Johnson

Strawberry Industry and Cooperating Growers

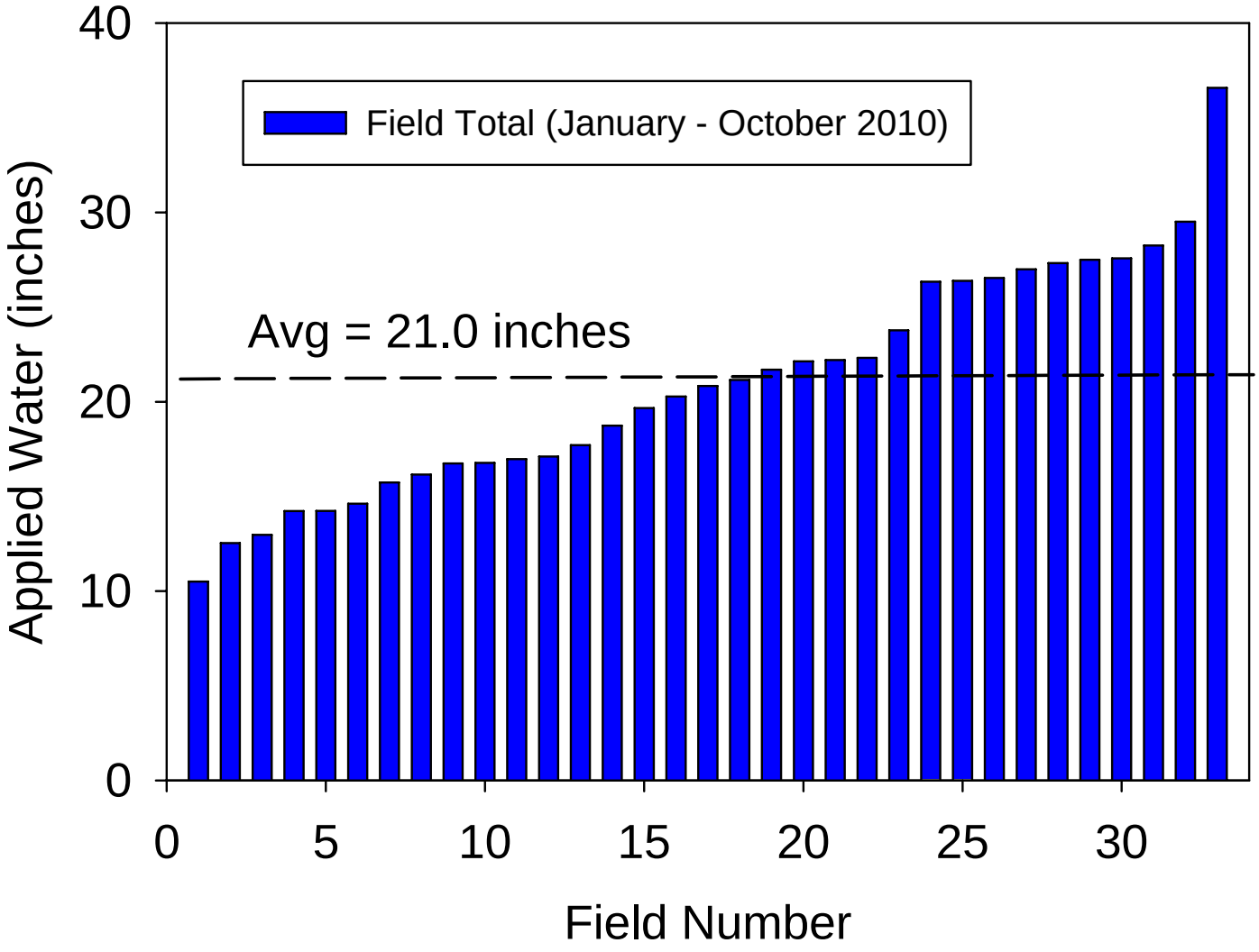
Specific questions about Strawberry Irrigation

- How much water is applied during the production season?
- How much do water requirements of strawberry vary among locations, varieties, and soils?
- Are there opportunities to conserve water or improve production with better management?

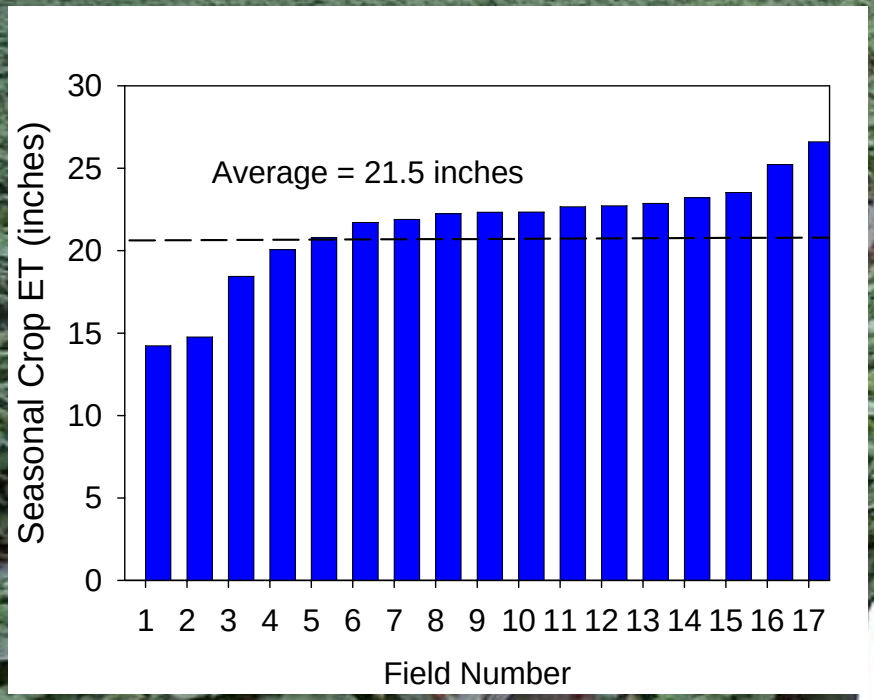
We monitored 34 strawberry fields during the 2010 production season

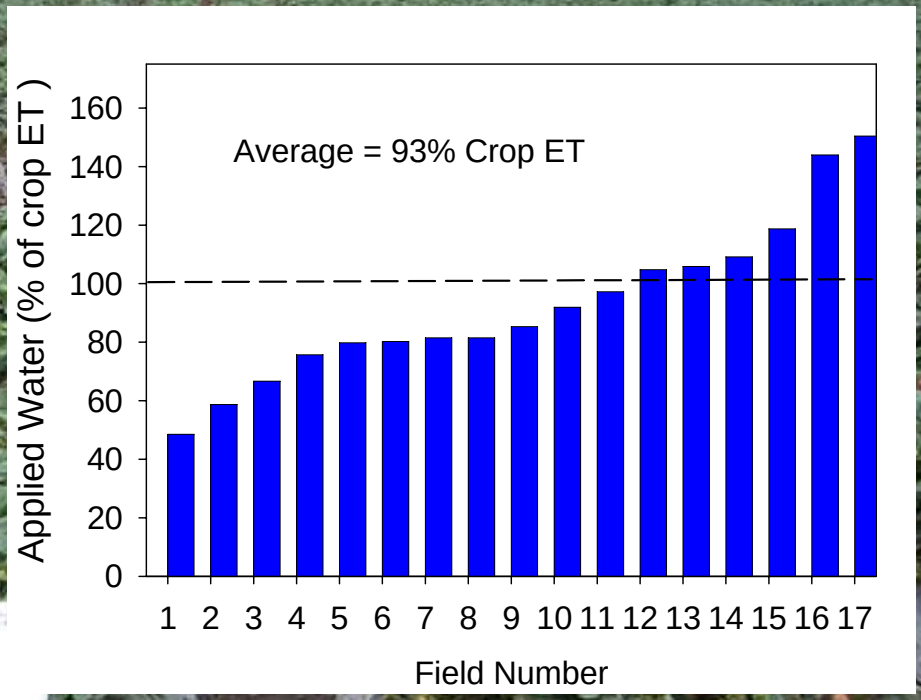
- Proprietary and UC variety (Albion)
- Pajaro and Salinas Valleys
- Flow meters installed to monitor ~ 0.5 acres
- Subset of 17 fields were intensively evaluated for irrigation schedule, soil moisture, salinity, soil and plant nutrients

Total Seasonal Applied Water



Did growers over or under apply water?





Crop coefficients for strawberry were based on canopy cover:

$$ET_{crop} = ET_{ref} \times K_{crop}$$

K_c varied from 0.05 to 0.95

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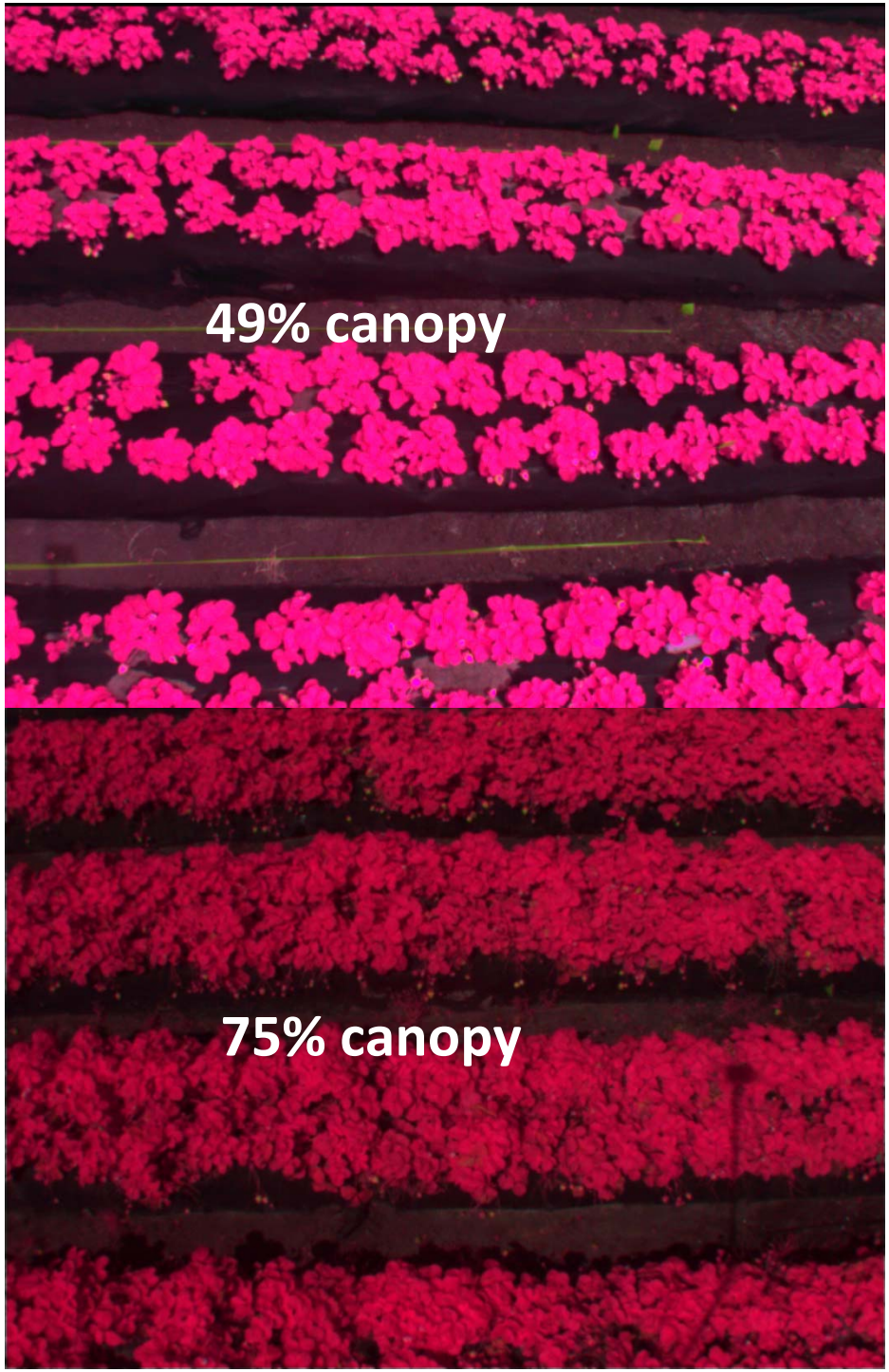
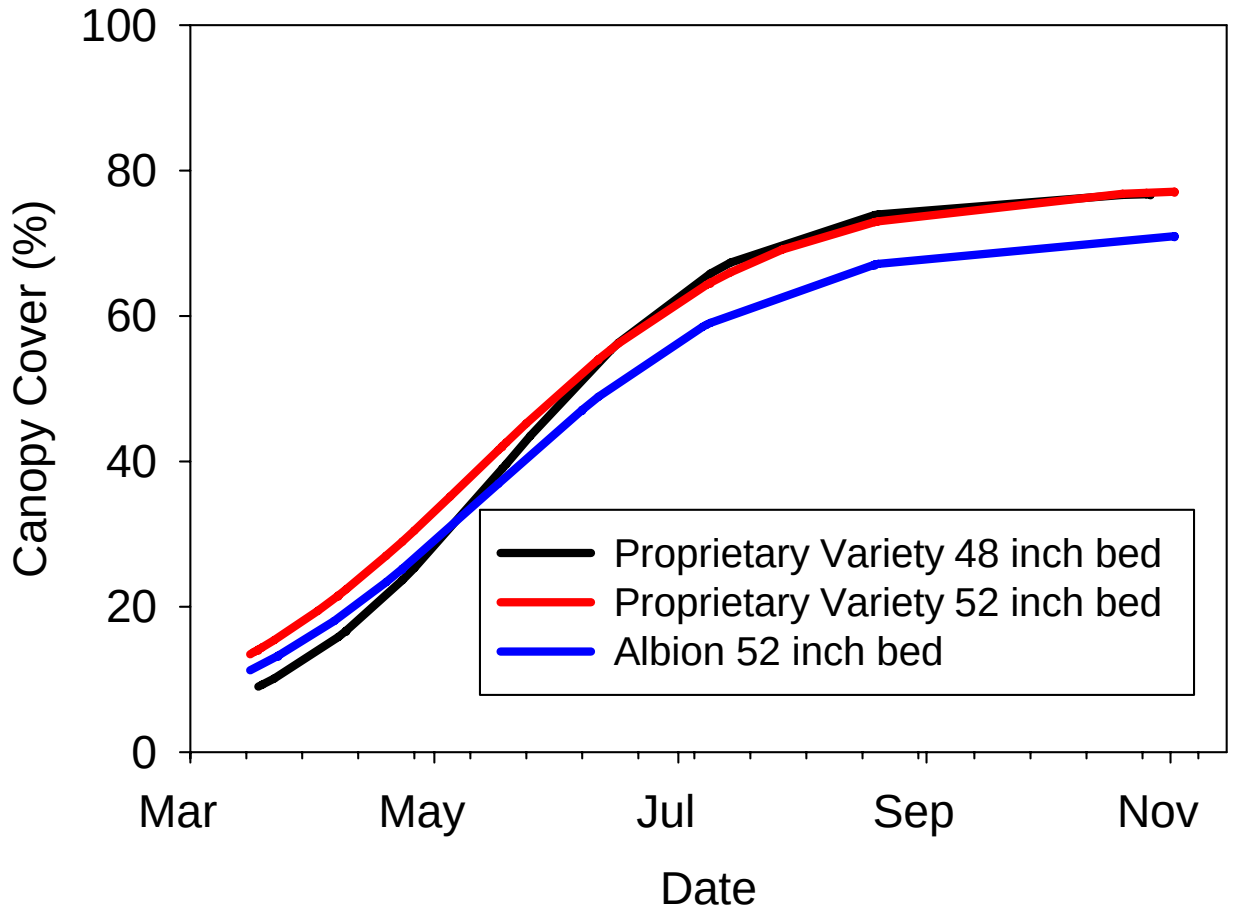


Canopy development was similar among varieties and planting configurations



Does yield potential affect water requirement?

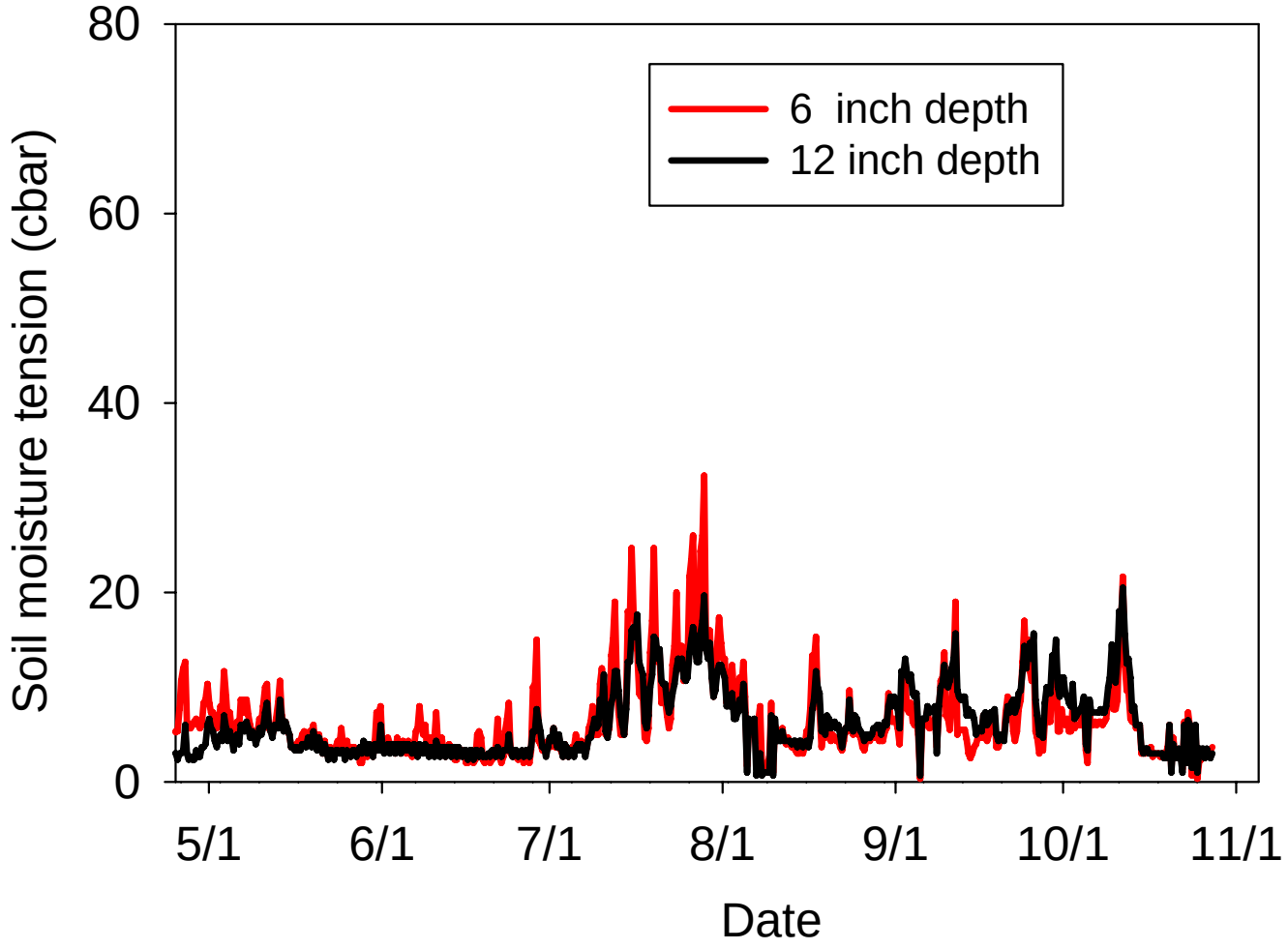
6500 cartons/ac × 11.5 lbs/carton = 74750 lbs/ac

74750 lbs/ac ÷ 8.3 lbs/gal = 9006 gal/acre

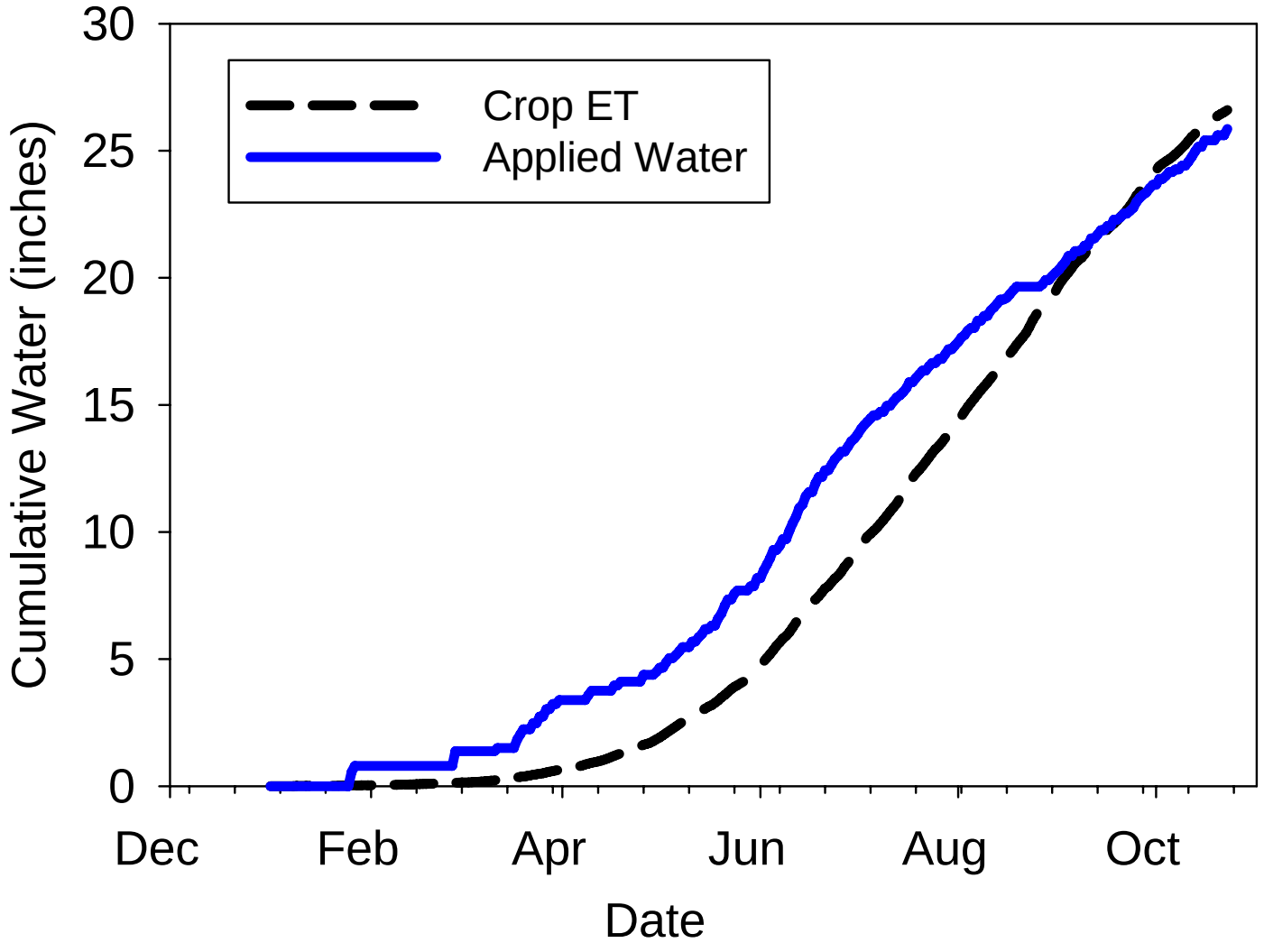
9006 gal/acre ÷ 27154 gal/acre-inch = 0.33 inches or 1.6% of seasonal amount of water (21 in) applied to berries

Effects of irrigation on seasonal soil moisture

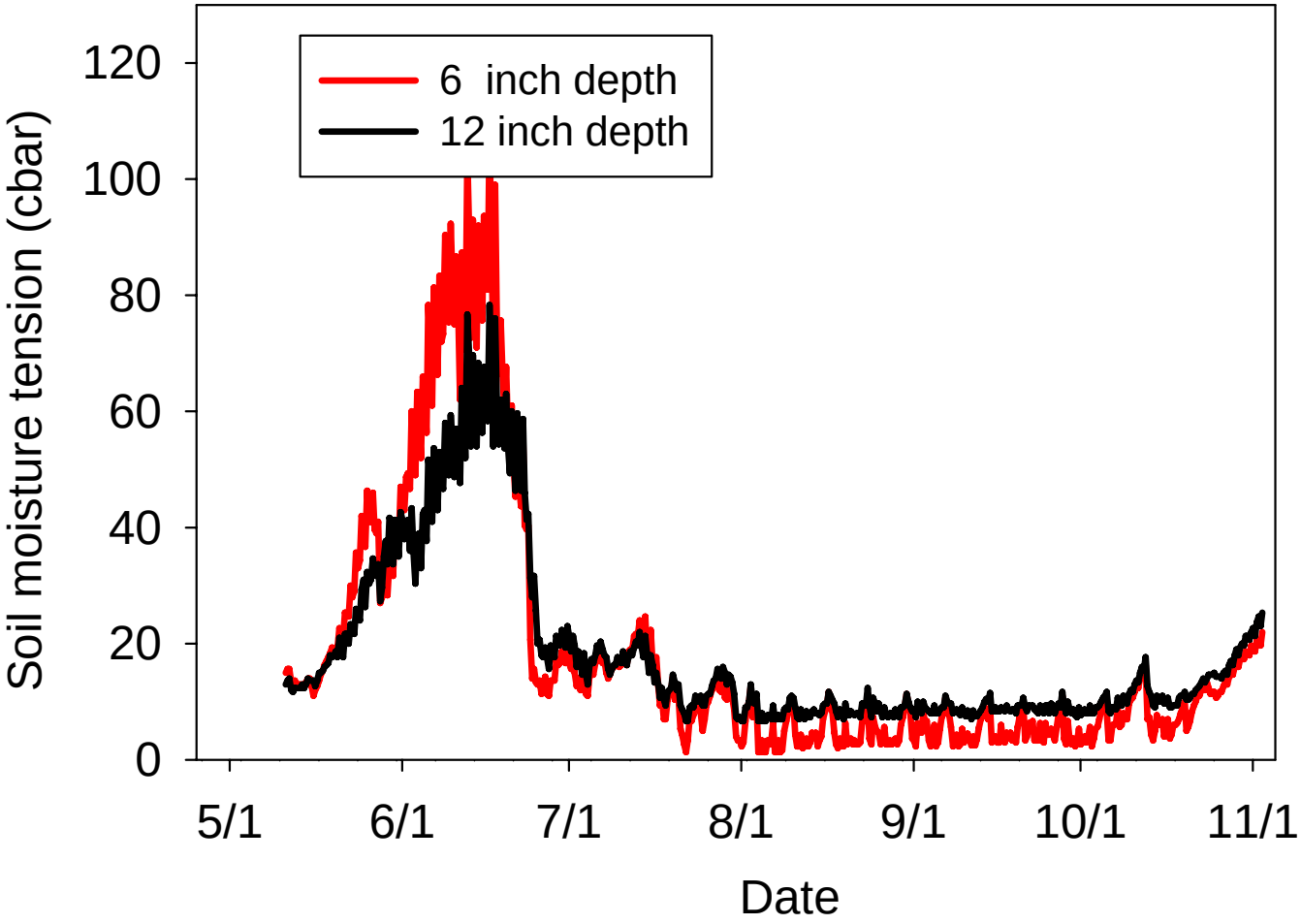
Watermark Soil Water Tension (Site 17-Sandy Loam)



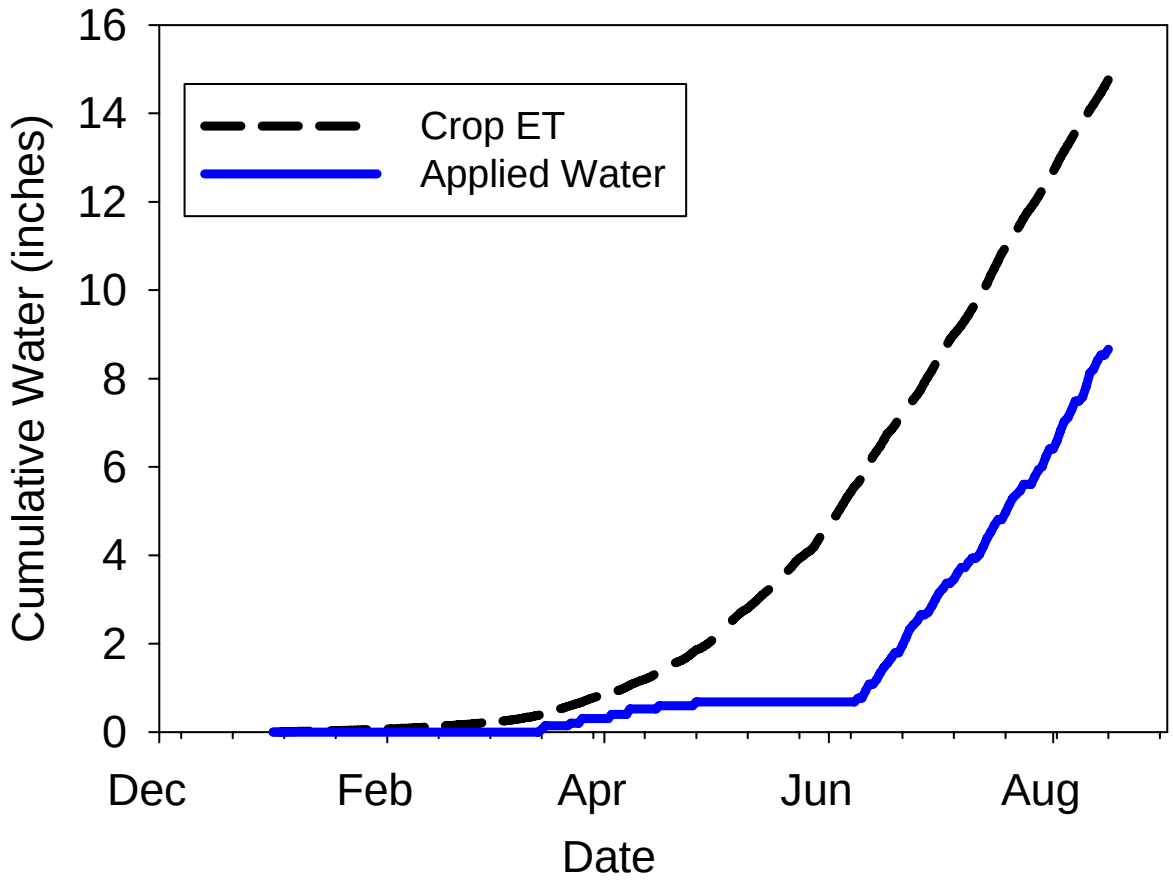
Applied Water and Crop ET (Site 17-Sandy Loam)



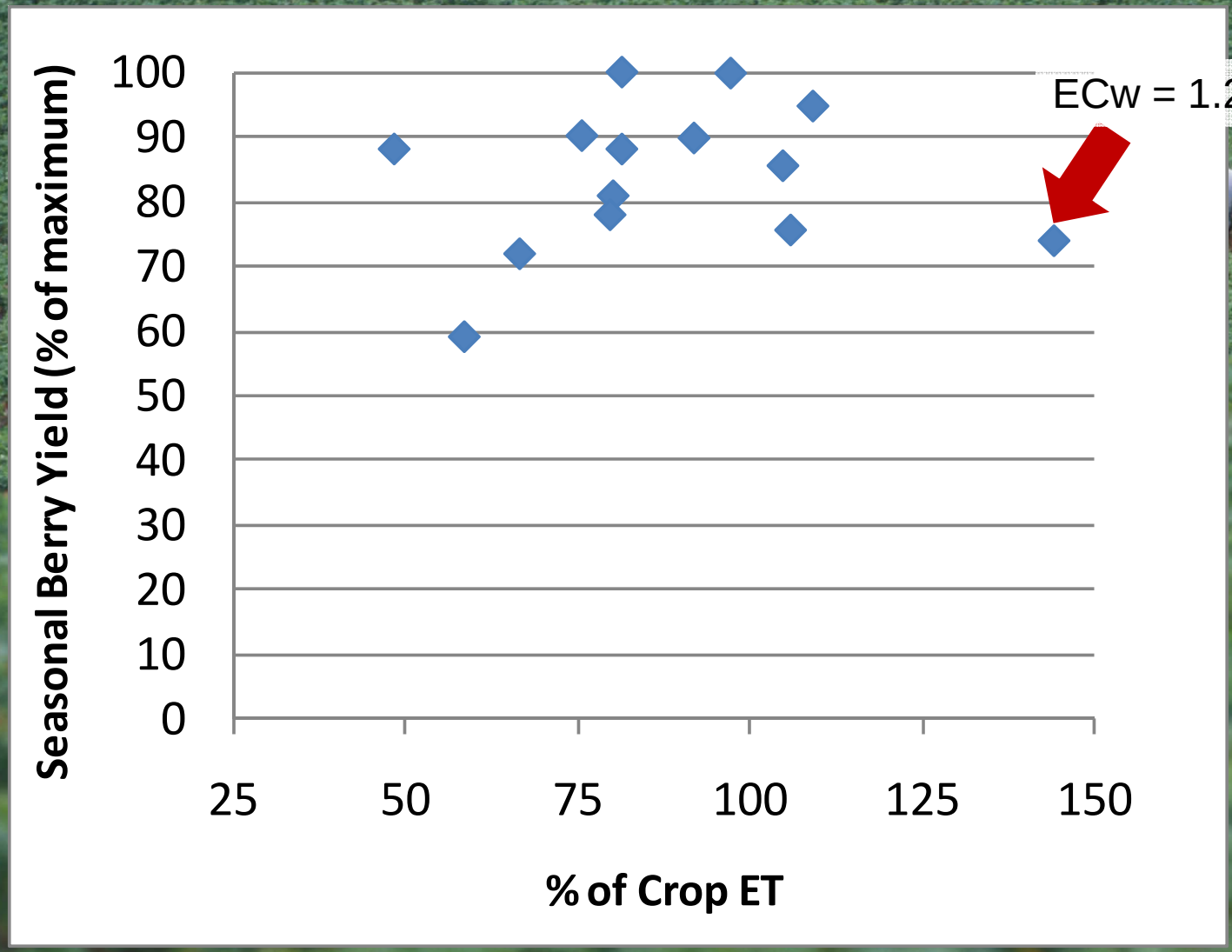
Watermark --Soil Water Tension (Site 13- Silt Loam)



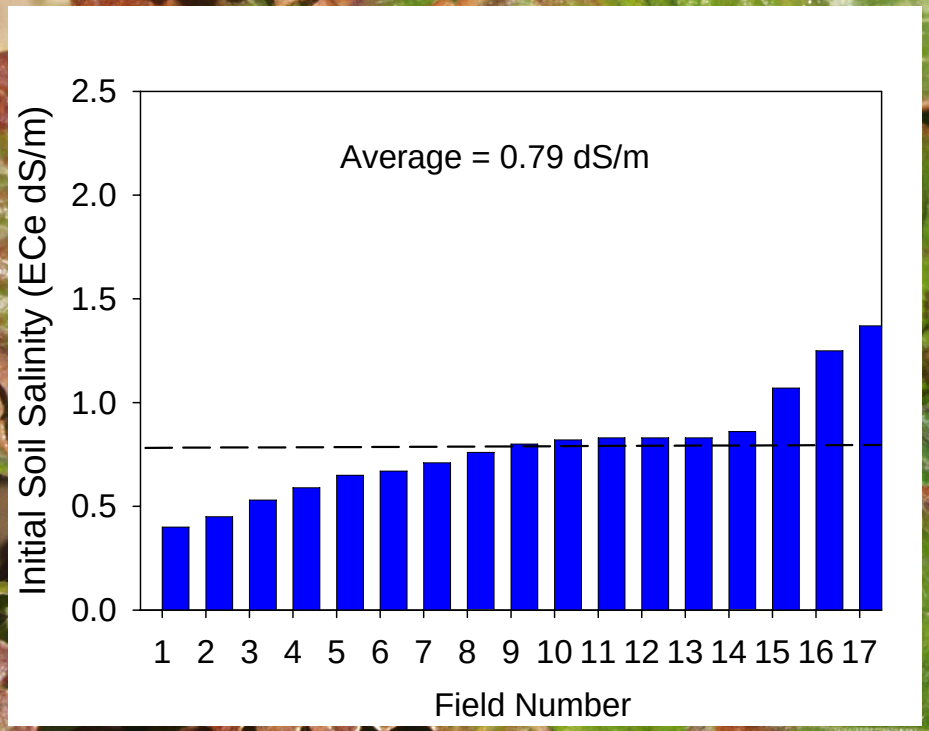
Applied Water and Crop ET (Site 13-Silt Loam)

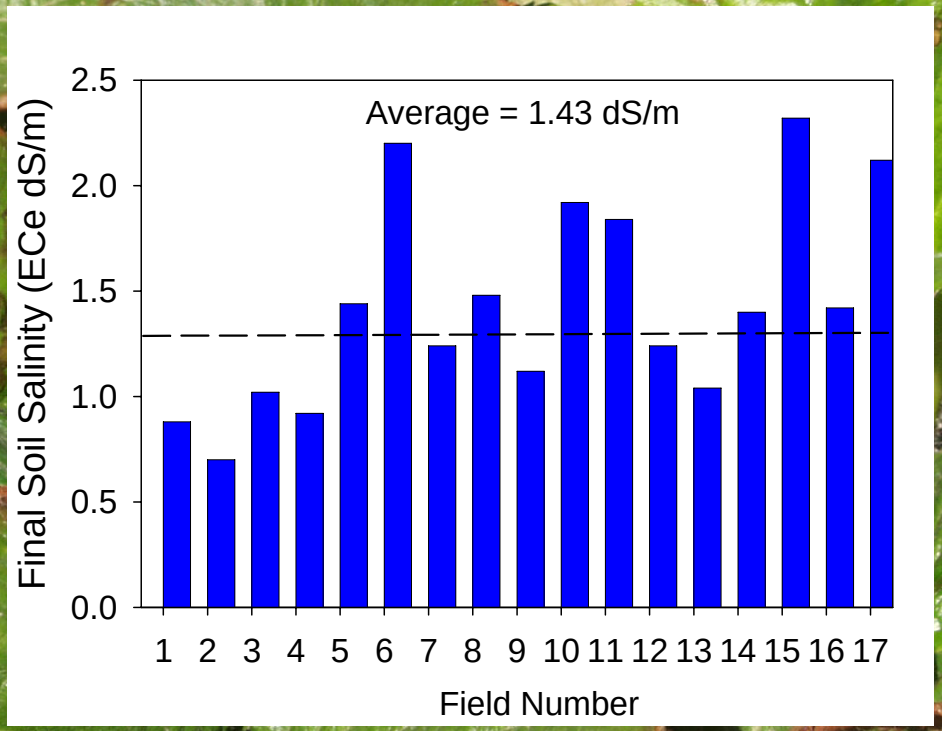


Effect of Irrigation on Fruit Yield

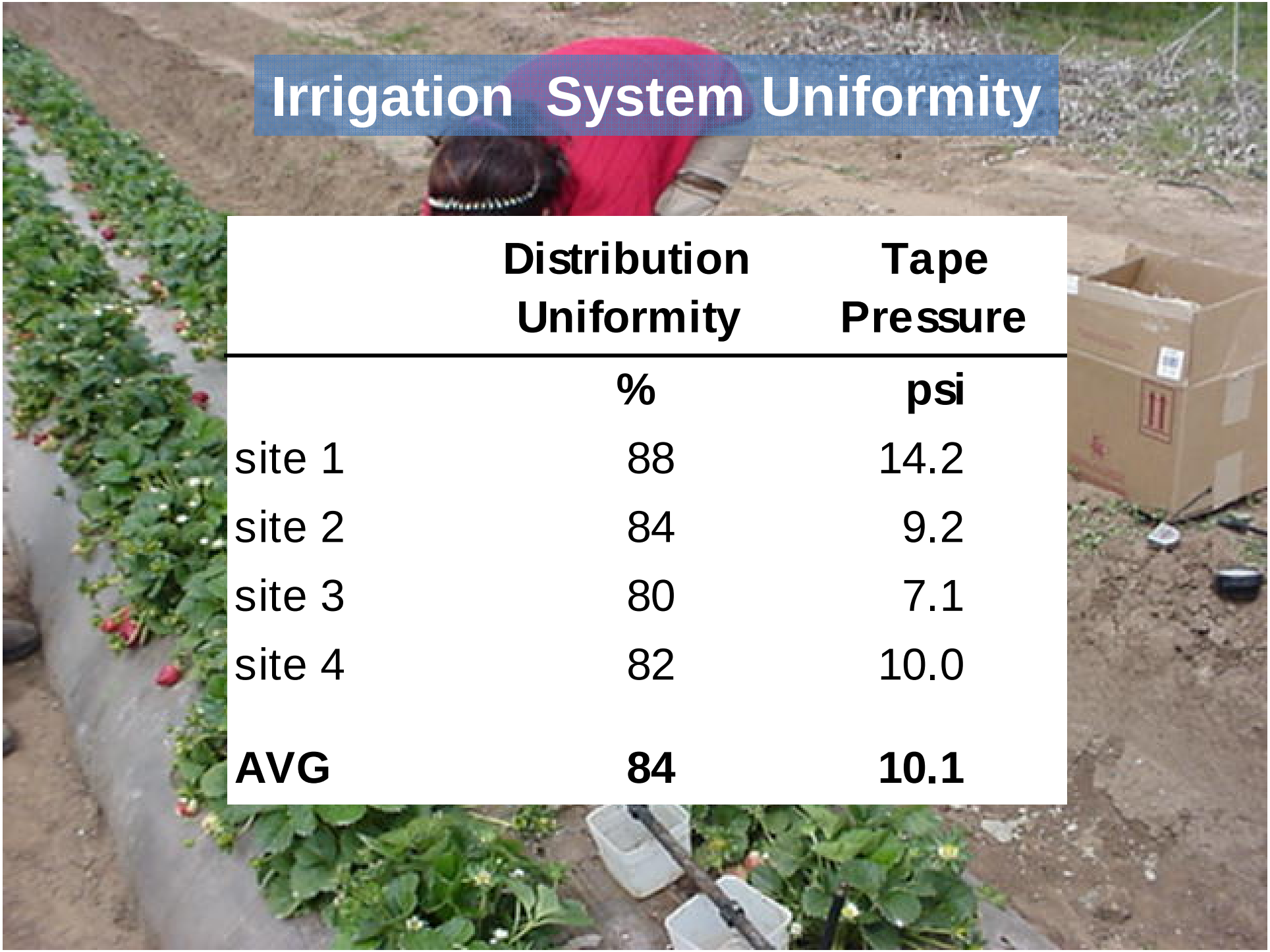


Average Soil Salinity levels increased by 0.64 dS/m





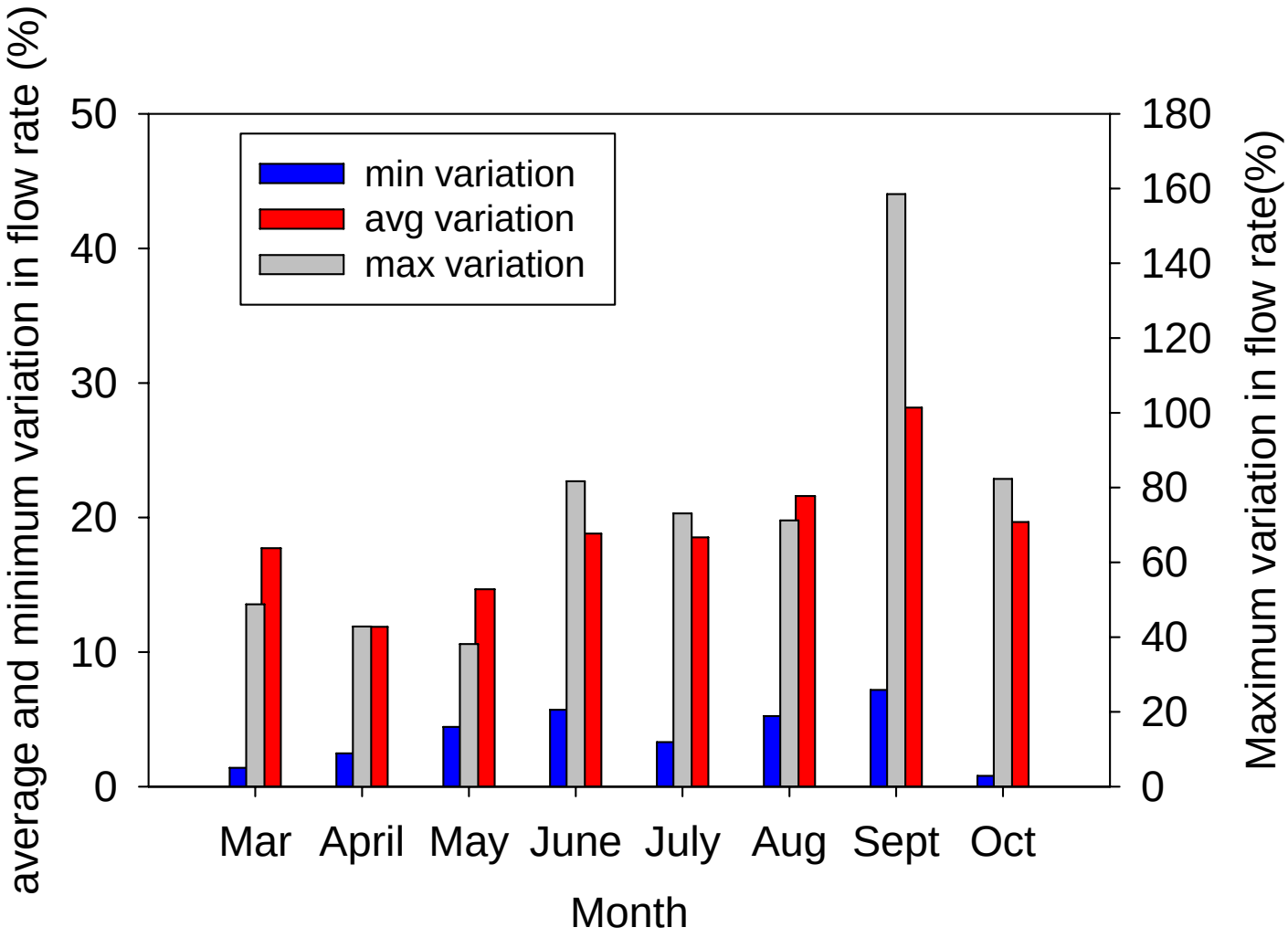
Soil ECe of 1.3 dS/m = 90% of yield potential

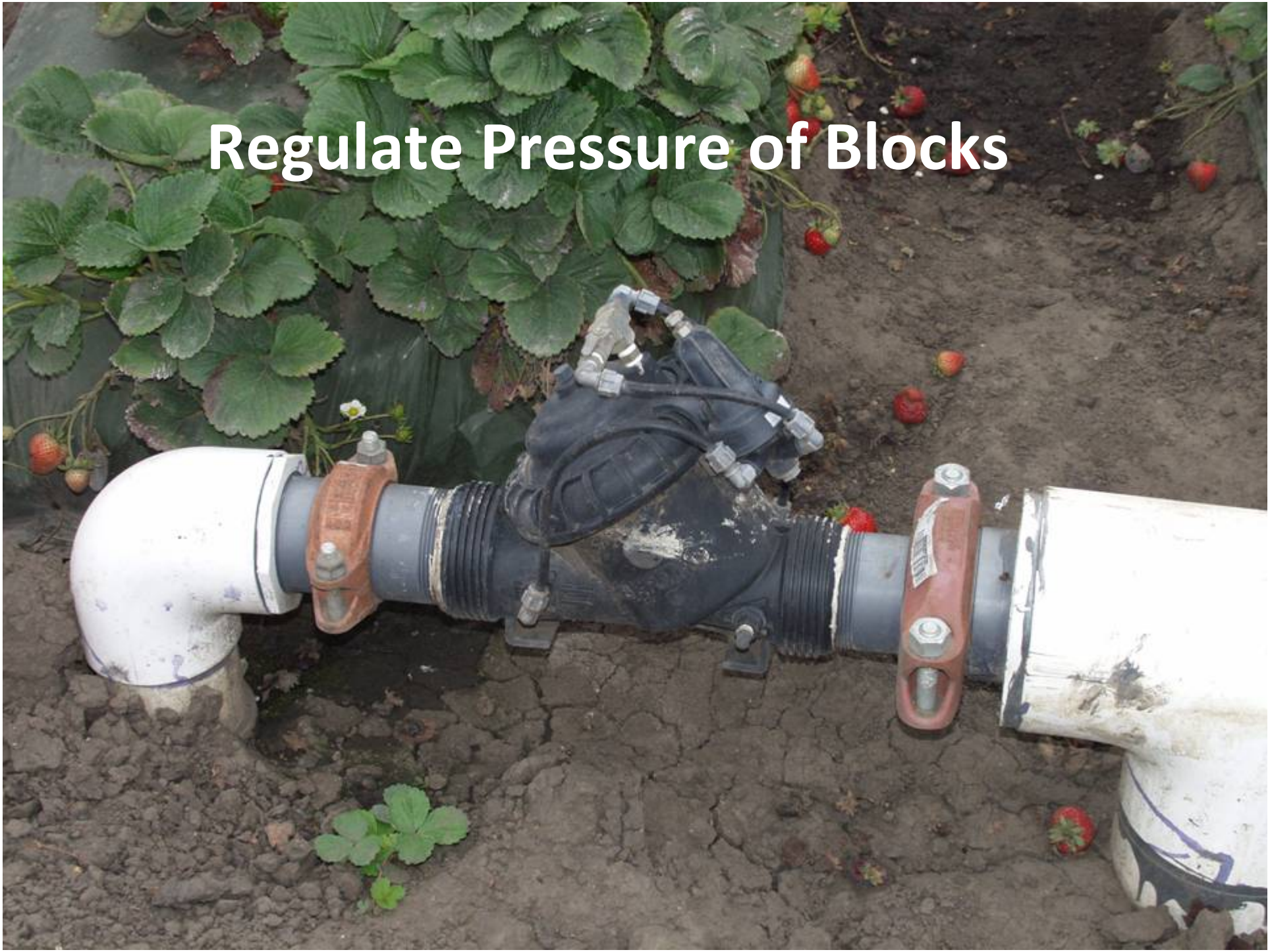


Irrigation System Uniformity

	Distribution Uniformity	Tape Pressure
	%	psi
site 1	88	14.2
site 2	84	9.2
site 3	80	7.1
site 4	82	10.0
AVG	**84**	**10.1**

Average system flow rate variation = 19%




Regulate Pressure of Blocks

Summary

- Seasonal water applied to strawberries ranged from 10 to 37 inches (avg = 21 inches)
- Variation in applied water could not be explained by differences in crop ET, planting configurations or variety
- Poor control of pressure may partially explain variation in applied water
- Applying less water than 75% of crop ET may lead to higher soil salinity levels and yield loss