

Why Mess With Flow Meters?

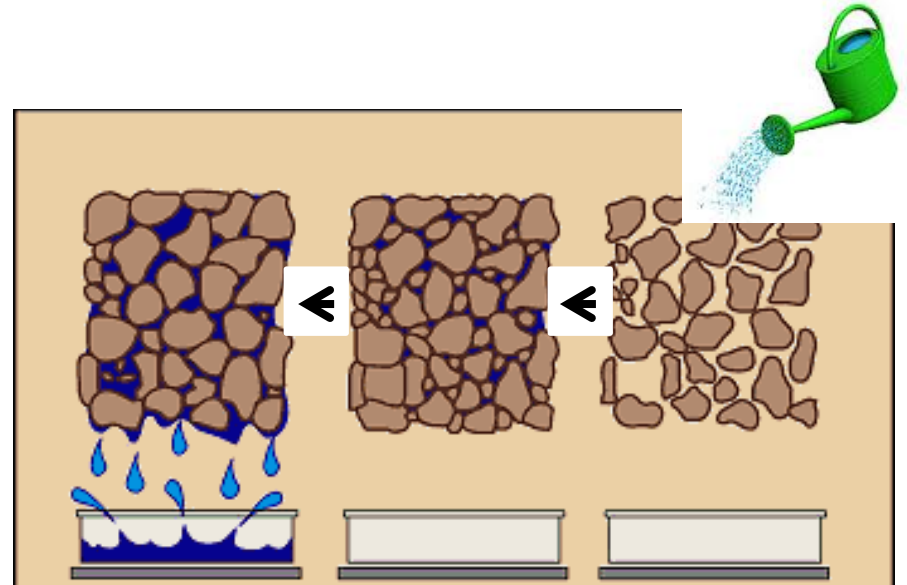
2014 Drought and Irrigation
Conservation Conference

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Why Keep Track of How Much Water You Apply?

- The soil can only hold so much water
- You want to know if the amount you apply stays in the root zone
- With this information you can compare the amount you applied to the available storage



How Can I Determine Available Storage?

- Direct soil moisture monitoring
- Climate based crop water use (estimating water removed from soil)
- Discussed in more detail by others

Appearance of fine sand and loamy fine sand soils at various soil moisture conditions.

Available Water Capacity
0.6-1.2 inches/foot

Percent Available: Currently available soil moisture as a percent of available water capacity.
In/ft. Depleted: Inches of water currently needed to refill a foot of soil to field capacity.

0-25 percent available
1.2-0.5 in./ft. depleted

Dry, loose, will hold together if not disturbed, loose sand grains on fingers with applied pressure. (Not pictured)

50-75 percent available
0.6-0.2 in./ft. depleted

Moist, forms a weak ball with loose and aggregated sand grains on fingers, darkened color, moderate water staining on fingers, will not ribbon.

75-100 percent available
0.3-0.0 in./ft. depleted

Wet, forms a weak ball, loose and aggregated sand grains remain on fingers, darkened color, heavy water staining on fingers, will not ribbon.



How Can I Determine Amounts Applied?

- OK - Using the irrigation system “application rate”
- Best - Using a flow meter
(Also helps to I.D. system problems)



The Application Rate Method:

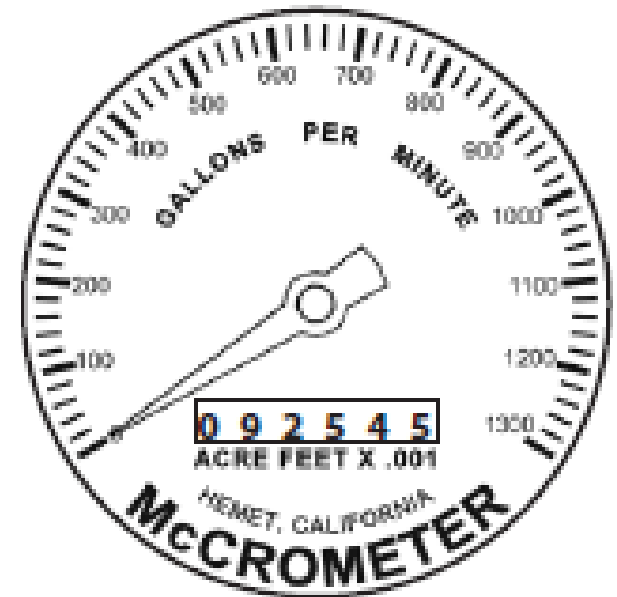
- Inches applied = Application Rate (inches/hour) X System Run Time (hours)

Example: 0.25 in/hr X 4 hr set = 1 inch application (estimate)

The Flow Meter Method:

- Inches applied = Acre-Feet applied divided by the acres irrigated X 12 in/ft.

Example: 1.6 ac-ft X 12in/ft = 1.5 inch application
13 ac block



Available Storage - What If Only Part of the Soil is Wetted?

Available storage measured by direct soil moisture monitoring – Multiply by % of area wetted.

Example:

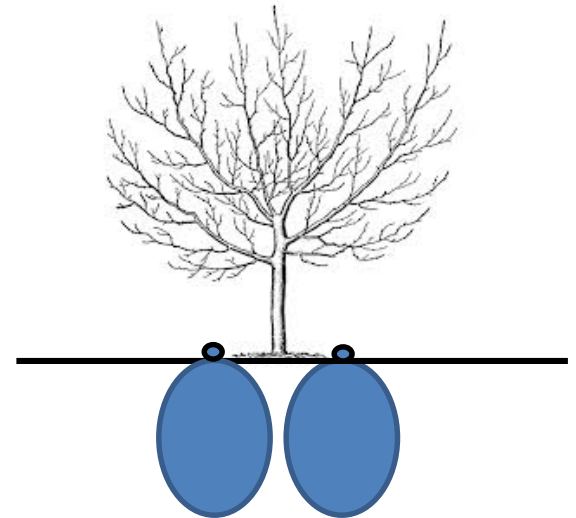
Measured available storage is 2 inches

% area wetted is 60

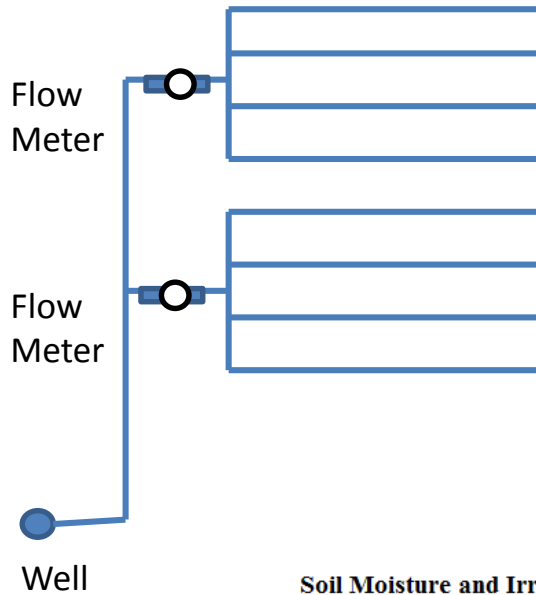
Average available storage across the field

$$= 0.60 \times 2 = \underline{1.2 \text{ inches}}$$

Available storage estimated by climate based method – No adjustment necessary



How Can I Collect and Record Data?



Soil Moisture and Irrigation Record
(High Intensity IWM)

Crop: _____ Planting Date: _____ Field: _____

¹ Date	² Average Rootzone Moisture Readings			³ Estimated Soil Moisture Depletion (SMD) of Limiting Soil (inches)	⁴ Threshold Depletion (inches or meter reading)	⁵ Target Amount of Water to Apply (inches, gallons/plant, or hours)	⁶ Actual Water Applied (inches)
	Site A	Site B	Site C				

