Successful on-farm practices to reduce water and fertilizer losses to groundwater

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SBX 2 1 Committee May 23, 2012

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Drip Irrigation & Fertigation

- Onions need sprinkler + drip
- 4 lines/40” beds vs. 10 lines/80” beds
- Drip has less fertilizer and water lost due to
  - Wind erosion
  - Surface runoff
  - Leaching to groundwater
- Can result in higher quality crop due to more uniform applications
- Cannot use drip on every crop but it is useful tool

Drip: a growing trend in Monterey County

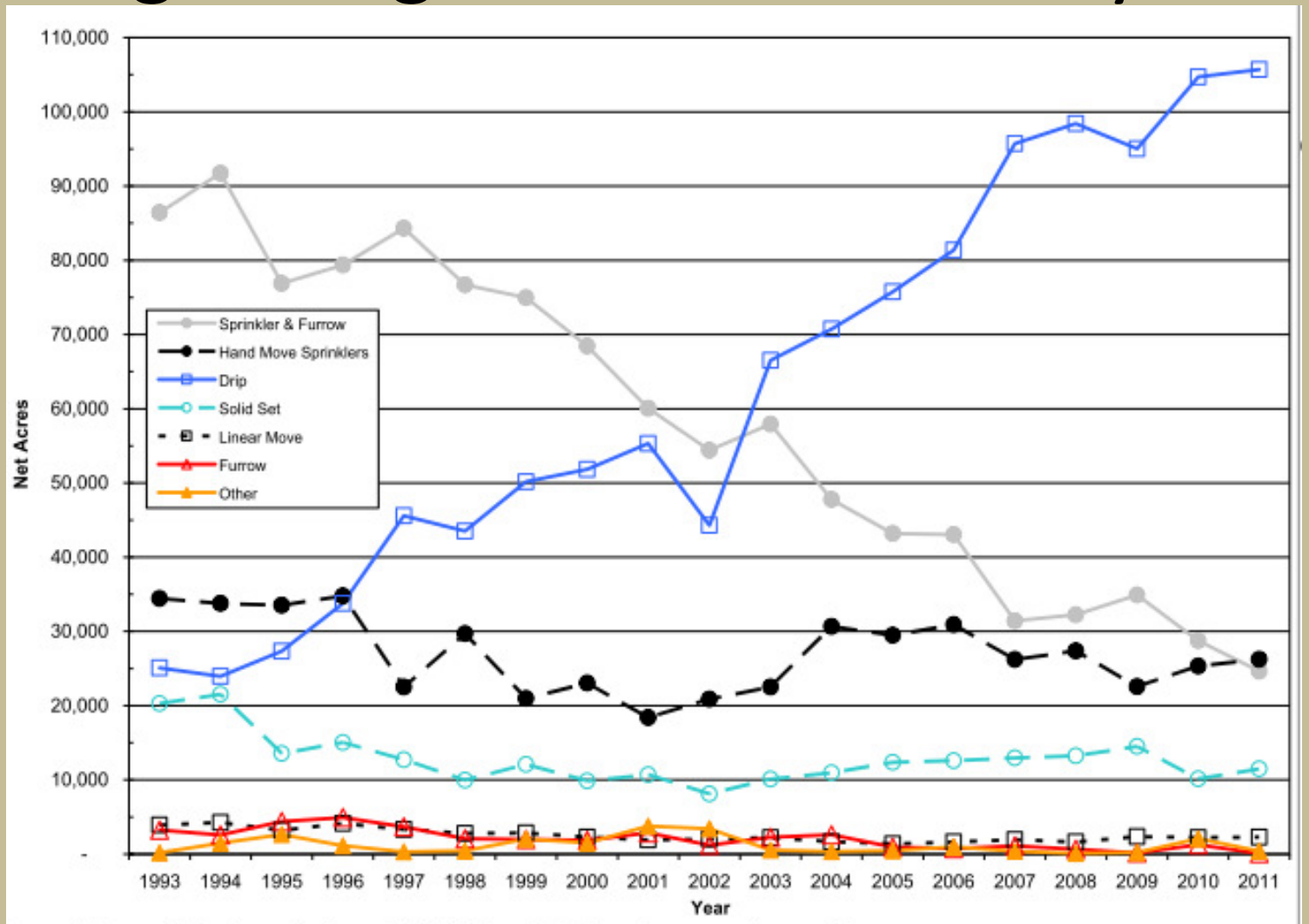

Figure 5. Types of irrigation methods used in the Salinas Valley based on companies reported

NOTE: Reported net acres vary from year to year

Monterey Water Resources Agency, 2010 Report.
http://www.mcwra.co.monterey.ca.us/Agency_data/ GEMS_Reports/2010%20Summary%20Report.pdf

Split applications of fertilizer

- "Spoon feeding" of fertilizer at key growing periods
- Take the time to understand when your crop wants to be fed!

Nitrogen Fertilizer Requirements of Cool-Season Vegetable Crops Grown Under California Conditions[ii]

Crop	Approximate Nitrogen Requirements (lb/acre-week)			
Broccoli[1]	Early Growth 5-15[2]	Mid Season 10-20	Button Formation 15-30	Head Development 10-20
Cabbage	Early Growth 5	Mid Season 35	Curling 40	Heading 55
Celery	Early Growth 5	Mid Season 15	Late Season 25	
Garlic	Early Growth 5	Mid Season 10	Bulbing 15	
Lettuce[1]	Early Growth 5-10	Cupping 10-20	Head Filling 15-30	
Onion	Early Growth 5	Mid Season 15	Bulbing 10	

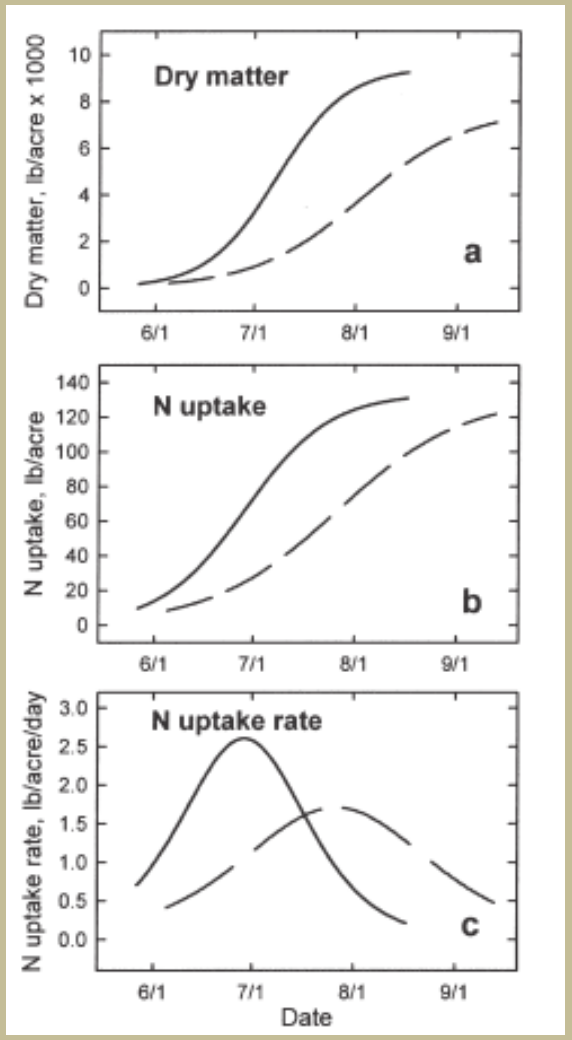

Table from: Monterey Water Resources Agency and Santa Clara Valley Water District. Using the Nitrate Present in Soil and Water in Your Fertilizer Calculations. Fact Sheet 4. http://www.pvwma.dst.ca.us/water_conservation_agr/assests/FactSheet%204-nitrate_fertilizer_calcs.pdf
Nutrient Graphs from : Brown, Brad. Southern Idaho Fertilizer Guide. University of Idaho Cooperative Extension System. CIS 1081. http://www.extension.uidaho.edu/nutrient/pdf/Specialty/OnionFertGuide.pdf

Composting

Quick Nitrate Soil Tests

- June-August testing, every year since 1997, over 300 samples
- Focus is between first and second crop
- Make & follow recommendation of fertilizer application
- Summer intern project

On-farm nitrogen tests improve fertilizer efficiency, protect groundwater

Timothy K. Hartz ❑ Richard F. Smith ❑ Kurt F. Schulbach ❑ Michelle LeStrange

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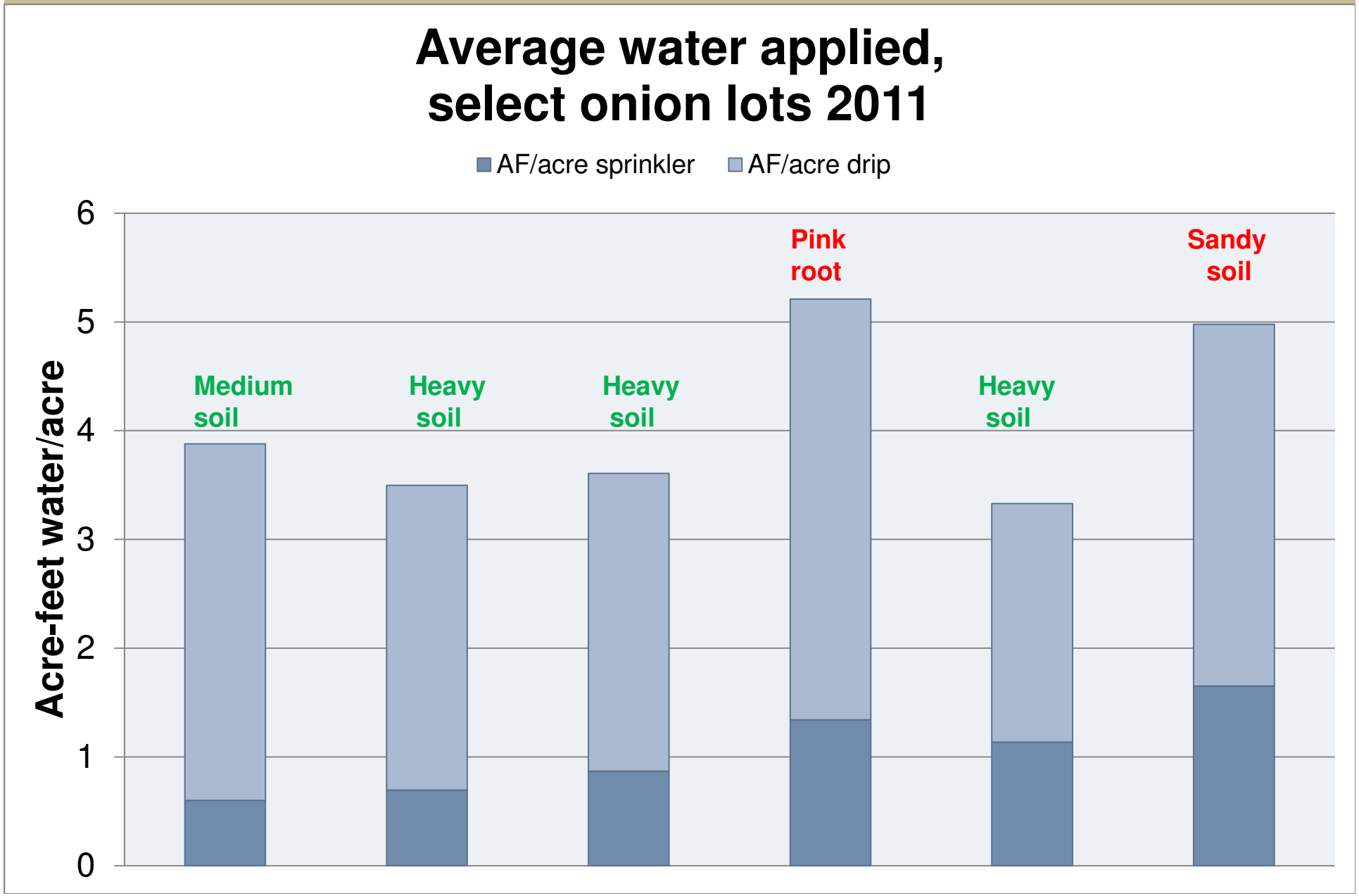
Water Meters

"You can't manage what you don't measure"

- Installed in 6 fields with different soils
- Brand: SeaMetrics AG 2000
- Investment (6 meters): $7,500

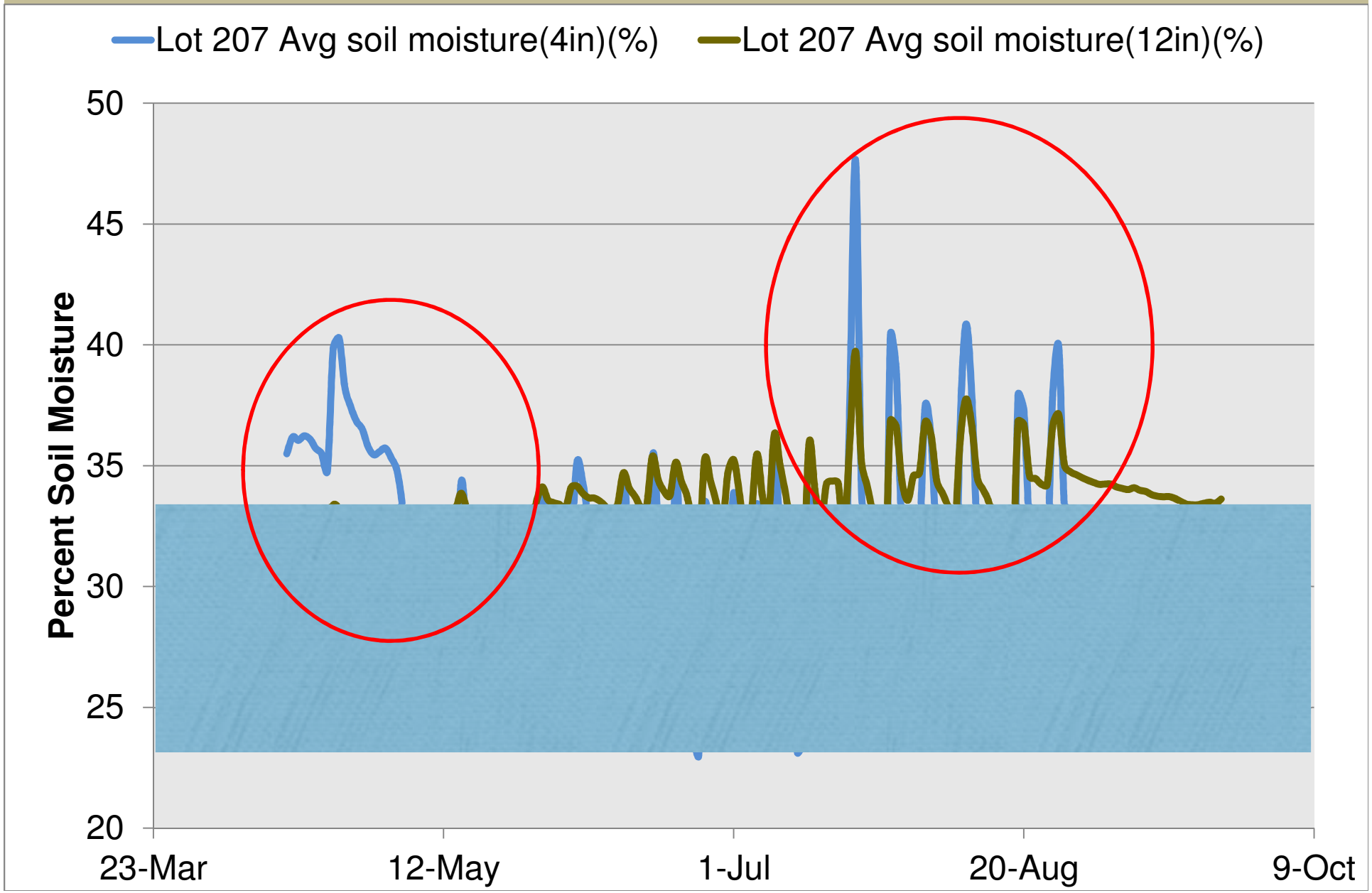
Water meter results



Soil Moisture Sensors

- 3 sensors + 1 base weather station (Solar Powered)
- 4 and 12 inch depths
- 2 inch soil temperature –bolting info
- Ideal moisture zone set based on science = soil test and crop characteristics
- Internet data access + automatic e-mails or text messages
- Pressure switch to give accurate # hours of irrigation
- Brands: Climate Minder (King City) and Pure Sense (other regions) used
- Investment (3 meters, 1 base): $11,000

Soil Moisture Sensor Results



Educational Partnerships

- Working with UC-Cooperative Extension, Resource Conservation District and other partners
- Irrigation Uniformity Testing (planned summer 2012)
- Water quality meetings and trainings
- Incorporating information in publications into growing practices

RCDMC Conservation Connections
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY

UC CE University of California Cooperative Extension Monterey County

Last thoughts

- Farmers know there is a water quality problem.
- Regulators should work towards solutions that fix the problem, not create expensive paperwork.
- Promote the obvious and easy fixes –irrigation efficiency and uniformity testing, split applications of fertilizer, other grower education
- Encourage the use of expensive technology such as soil moisture sensors through incentive programs, collective purchase agreements etc.
- Let's encourage and fund research and grower assistance with people farmers respect – UCCE, RCDs etc.

Questions?

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