

Water Smart Farming

Community Alliance with Family Farmers

April 19, 2021

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Keys to Water Conservation

- ◇ Deliver what is needed-no more, no less
- ◇ Water Budgeting-Choose the right crops
- ◇ Move from overhead to microsprinklers and drip systems
- ◇ Maintain and monitor irrigation systems
- ◇ Match irrigation to soil type and water holding capacity
- ◇ Build up organic matter in soil
- ◇ Use scheduling tools vs intuition or historical habits
- ◇ Use a full suite of approaches to achieve irrigation efficiency



Water Budgeting

- ◇ How much water do you have?
- ◇ How much water do you need?
- ◇ Determine individual crop needs and soil water holding capacity
- ◇ Rule out high water need crops
- ◇ Rule out low crops with low net value



Save Water

Practices:

- ◇ Move from overhead to microsprinklers and drip
- ◇ Steadfastly maintain and monitor systems
- ◇ Avoid leaks and blowouts
- ◇ Measure and quantify water use

Tools:

- ◇ Timers and Controllers
- ◇ Use optimal irrigation equipment
- ◇ Improved scheduling with soil moisture probes, ET tracking, software,
- ◇ Flow meters



Microsprinklers and Drip Irrigation

- ◇ Drip Tube, Tape and Emitters
- ◇ Microsprinklers



Maximize Equipment Efficiency

- ◇ Maximize Distribution Uniformity
- ◇ Use pressure compensating equipment when possible
- ◇ Install pressure regulators
- ◇ Measure pressures and flows
- ◇ Install and maintain filters



Steadfastly Maintain and Monitor Systems

- ◇ Walk the lines when in use
- ◇ Measure pressures and flows
- ◇ Fix issues immediately
- ◇ Upgrade equipment when possible
- ◇ Use flow meters



Avoid Leaks



Measure and quantify water use

- ◇ Determine needs in advance
- ◇ Measure in the field with flow meters
- ◇ Track time of application
- ◇ Determine what works and what is needed



Tools



Timers and Controllers



Use Monitoring Tools to Assist with Scheduling

- ◇ Soil moisture
 - ◇ Shovel down to rootzone to observe moisture levels
 - ◇ Use soil moisture probes
- ◇ Weather/Evapotranspiration
- ◇ Monitoring tells us actual conditions and stress levels. It is the best indicator of when its time to irrigate



Soil Moisture Monitoring



← Soil matric potential sensors



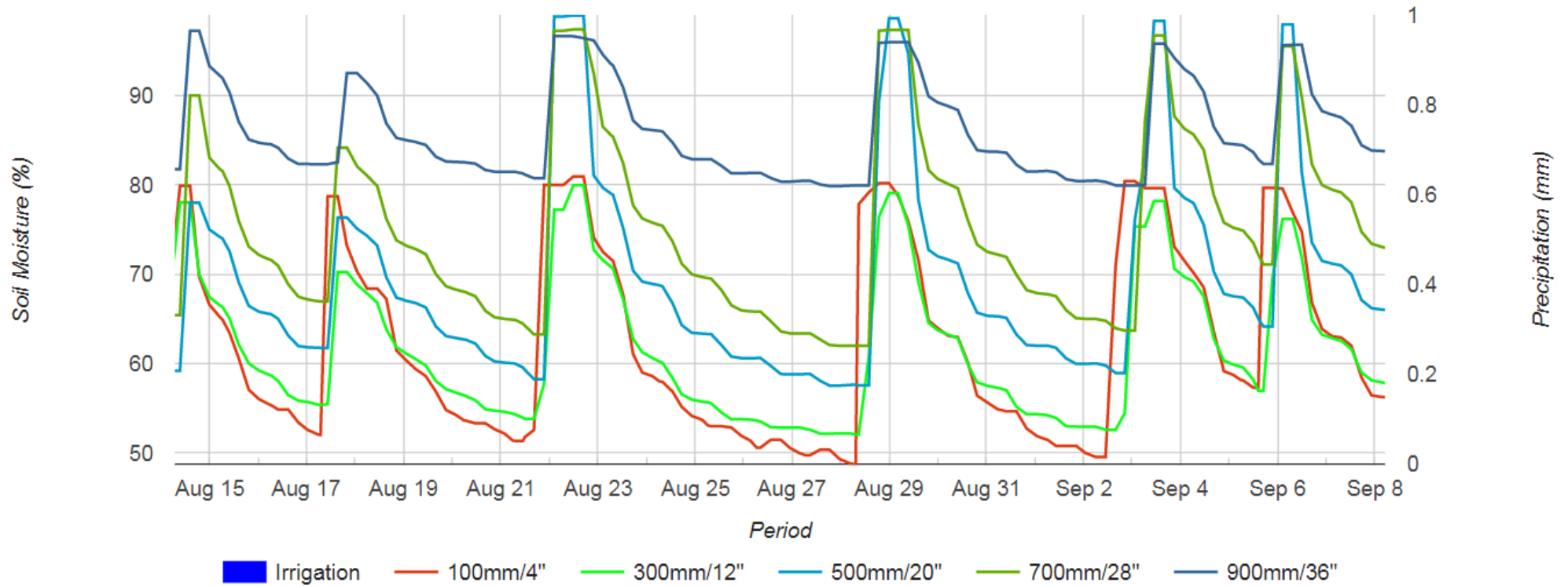
Soil water content sensors & probes ↓→



Irrigation Curves

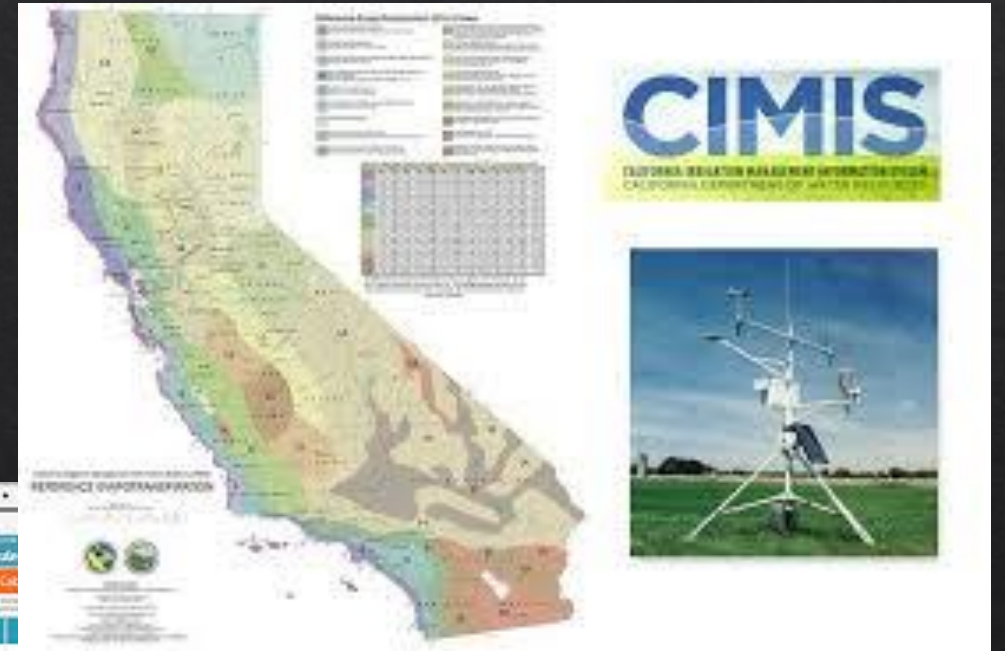
Sensors

Zinfandel: Plot 3: Grapevine in Scaled Frequency



Evapotranspiration (ET)

How much water is lost through
your plants?

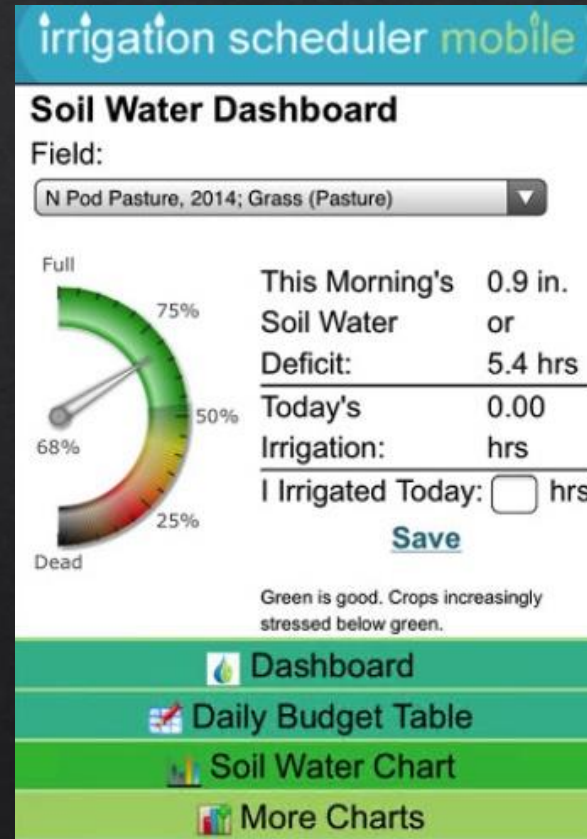


Weather Stations



Software for Scheduling

- ◇ Crop Manage
- ◇ Irriwatch
- ◇ Tucor
- ◇ Vinduino
- ◇ Netafim Netbeat



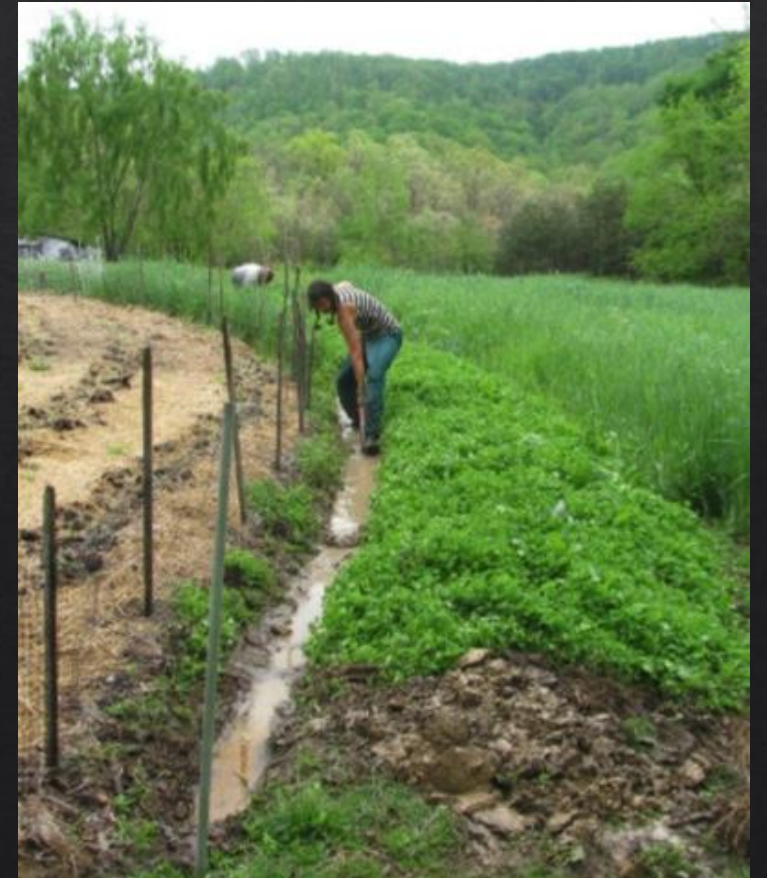
Collect and Retain Water

- ◆ Rainwater catchment with Tanks
- ◆ Maintain water onsite with swales and ditches
- ◆ Infiltrate more water on site
- ◆ Avoid runoff when irrigating



Field Practices to Increase Water Infiltration

- ◆ Increase organic matter content in the soil with compost, mulch, cover crops, and biochar
- ◆ Improved tillage
- ◆ Mow cover early
- ◆ Water in early morning, late in day, and at night
- ◆ Swales and berms
- ◆ Keep soil covered
- ◆ Minimize compaction



Water Holding Capacity of Organic Matter

- ◆ Organic matter holds roughly 18-20 times its own weight in water (NRCS)
- ◆ For each 1% increase of organic matter in the plow layer, soils can hold an additional acre inch of water
- ◆ One acre inch of water equals 27,154 gallons



Avoid Unnecessary Water Loss

- ◆ Install manual shut off valves for all hoses
- ◆ Replace gaskets
- ◆ Fix leaks
- ◆ Tighten screws and fittings on a regular schedule
- ◆ Wash equipment only as needed and offsite if possible
- ◆ Use options that don't require water
- ◆ Recycle water where possible/divert used water to other needs



Use Recycled Water



Increase Your Knowledge

- ◆ Become familiar with water use needs and tools available
- ◆ Visit regional irrigation suppliers: Harmony, Wyatt, Dripworks
- ◆ Find information online:
 - ◆ **ATTRA/NCAT** <https://attra.ncat.org/topics/water-management/>
 - ◆ **Cal Poly Irrigation Training and Research Center** <http://www.itrc.org/>
 - ◆ **CAWSI** <https://agwaterstewards.org/>
 - ◆ **Center for Irrigation Technology** <https://www.fresnostate.edu/jcast/cit/>
 - ◆ **UCCE** <http://cesonoma.ucanr.edu/DisasterResources/Drought/>
 - ◆ **UC ANR** <https://anrcatalog.ucanr.edu/>



Get Help

- ◆ NRCS EQIP Contract
- ◆ RCD
- ◆ UCCE
- ◆ Other farmers



Employ an Array of Practices to Save Water

- ◆ There is no silver bullet
- ◆ Using many techniques can add up to substantial savings
- ◆ Water efficiency takes time and attention
- ◆ It requires more attention on a year like this



Thank You! Questions?

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