



# Understanding Dynamics and Practices of Vineyard Irrigation Management

## Presentation to the WRAC

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# Overview

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- Background
- Seasonality of Water Usage
- Water Quality
- Best Practices for Water Conservation and Sustainability
- Economics of Water Usage



# Background

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- Central Coast Vineyard Team
  - Local Non-Profit Grassroots Grower Group
  - Dedicated to Sustainability since 1994
  - Field Research & Education, Self-Assessment, Certification
- Soil, Plant, Water Specialist
  - Irrigation Training & Research Center
  - 1998 Master Water Plan (Ag Water Analysis)



# Overview

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- Factors Affecting Irrigation Practices
- Best Management Practices
- Economic Incentives to Efficiently Apply Irrigation
- Industry Initiatives



# Factors Affecting Irrigation Practices

## How Much Does the Plant Need?

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- Canopy (leaf area)
- Weather
- Together They Determine the Evapotranspiration of the Plant
- Seasonality of Vine Water Use
- Central Coast Winegrapes are Under Irrigated to Promote Fruit Quality



# Factors Affecting Irrigation Practices

## How Much & When to Apply Water?

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- Effective Rainfall
- Soil Storage (Soil Moisture Reservoir)
- Irrigation System Performance
- Timing – To Match Application with Need



# Best Management Practices

## When & How Much to Irrigate

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- Weather Information (regional & onsite)
  - Data available electronically
- Soil Moisture Sensors
  - Indicates the status of the soil moisture reservoir
  - Placed throughout vineyard at various depths
  - Data uploaded to computers
- Plant Moisture Status
  - Pressure Bombs
- Observations – Leaf Tip & Soil Samples

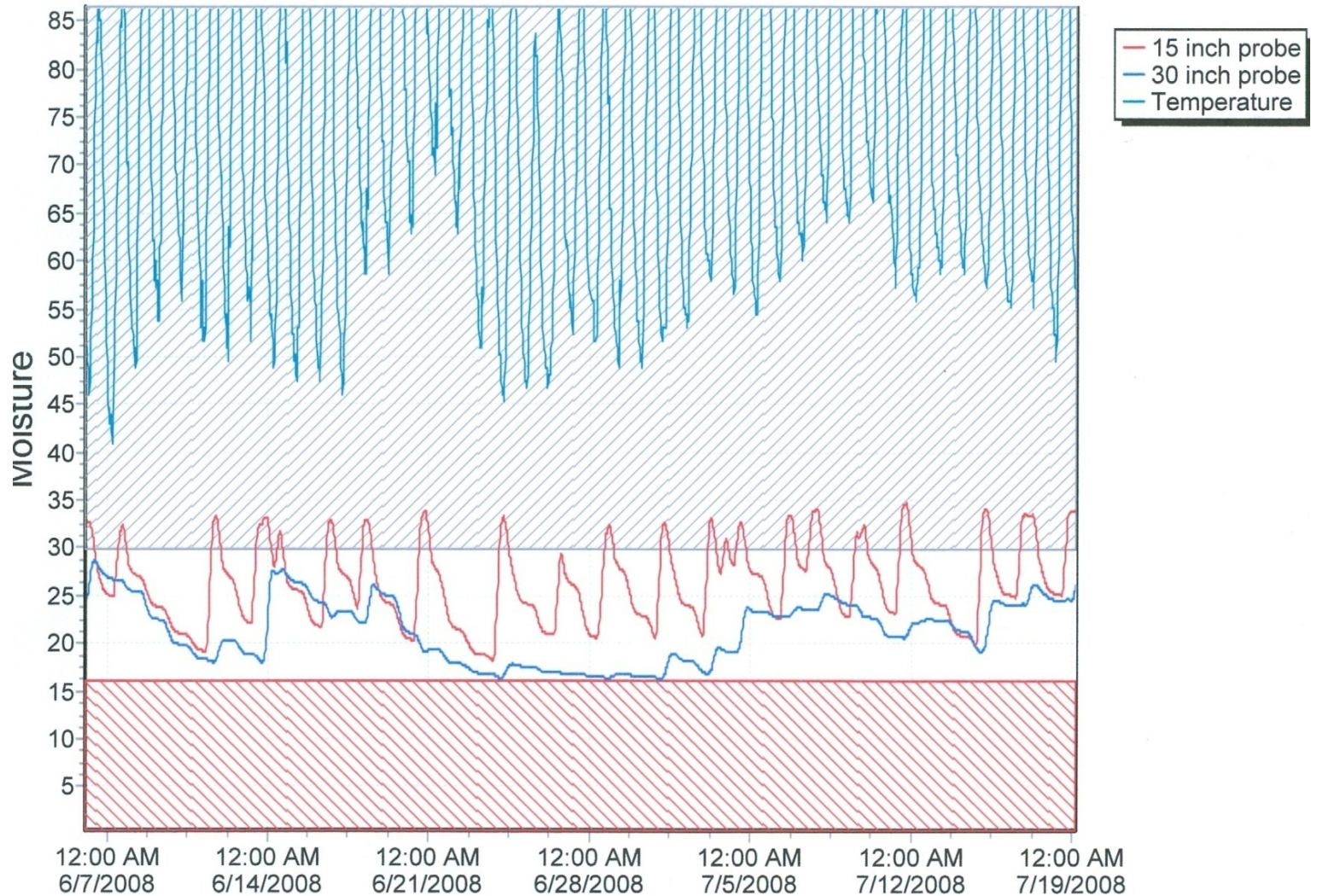
# PRWCA Weather Station Data

31 May 2009	Max/Min	24hr	Precipitation		Today's normals	Today's Records
			season	% normal		
Paso Robles	84/50	-	<b>5.80</b>	44%	84/48	107 (1970), 37 (1

## PRWCA Weather Summary

31 May 2009	<b>Las Tablas</b>	<b>Templeton</b>	<b>Paso</b>	<b>Creston</b>	<b>Shandon</b>
	Tablas Creek Vineyard	<b>Gap</b> Summerwood	<b>Robles</b> J. Lohr	Red Hills Vineyard	Shandon Hills Vineyard
Max Temperature Yesterday:	<b>83.7</b>	75.4	<b>86.0</b>	<b>84.6</b>	<b>88.5</b>
Min Temperature Yesterday:	49.1	50.2	49.4	46.6	46.5
Min Temperature this morning:	49.1	50.8	51.3	47.7	49.3
Rainfall Yesterday:	0.00	0.00	0.00	0.00	0.00
Rainfall since July 1st:	<b>14.85</b>	<b>9.10</b>	<b>6.84</b>	<b>5.89</b>	<b>5.37</b>
ETo Yesterday:	0.19	0.16	0.21	0.21	0.23
ETo Last 7 Days:	1.40	1.19	1.55	1.54	1.63

# Sample Soil Moisture Information





# Best Management Practices

## System Performance

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- Design
  - Drip Irrigation
  - Pressure Regulation
  - Filtration
- Maintenance
  - Pressure Regulation Adjustments
  - Hose & Filter Flushing
  - Water Quality Considerations
- Irrigation Evaluations (Feedback)
  - Mobile Labs



# Economic Incentives for Proper Irrigation Management

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- Fruit Quality
  - Deficit Irrigation Strategies Improve Fruit Quality
- Pumping & Energy Costs
  - Farm energy is typically the second highest production cost behind labor
  - Efficient irrigation will prolong the life of expensive pumps



# Best Management Practices

## Wineries

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- Acre Foot Definition

- 1 acre foot = 66' x 660' = 325,851 gal.

- J. Lohr Paso Robles Winery Water Usage

- 2003 3.5 gal. water to make 1 gal. wine
- 2007 1.2 gal.
- 600,000 cases = 1,440,000 gal. wine requires 1,728,000 gal. water = 5.3 acre feet



# Industry Initiatives

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- Weather Stations (PRWCA & UCCE)
- Outreach & Education
- Research
- Self-Assessment (Since 1996)
- Statewide Code of Sustainable Practices [www.sustainablewinegrowing.org](http://www.sustainablewinegrowing.org)
- Sustainability in Practice (SIP) Certification [www.vineyardteam.org](http://www.vineyardteam.org)



# Contact

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