



SUSTAINABILITY FROM THE GROUND UP

# California Almond Sustainability Program

## An Ag Community's Proactive Approach To Sustainable Water Management

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## SureHarvest, Inc

- For 10 years, SureHarvest has been helping farmers address sustainability and resource concerns through:
  - consulting to develop industry programs & manage industry sustainability data
  - developing farm management software tools
  - other services aimed at keeping farms competitive in the marketplace while stewarding the land
  - Stonefruit, leafy greens, hazelnuts, winegrapes, pears, citrus, potatoes, mushrooms, etc.
- Sonke – Doctorate in Plant Medicine, Univ of FL
  - Family almond farming background

## About the Almond Board of California

Grower-enacted "Federal Marketing Order" established in 1950

- Represents growers and handlers (processors)

Under the supervision of USDA

Voluntary 10 member Board of Directors (5 growers, 5 handlers)

- 16 committees and ~140 volunteer members

Funded by \$.03/lb assessment

Provides:

- Generic global marketing of almonds
- Sets grade standards
- Funds research in production, environmental issues, nutrition, and food safety/quality



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## California Almond Crop



- 100% of US Almond Production in CA
- 2010: 810,000 total acres  
740,000 bearing acres
- Farm Value  
2008: \$2.3 bill  
2009: \$1.8 bill
- Production  
2008: 1.6 bill lbs  
2009: 1.4 bill lbs
- US' top horticultural crop in export value
- ~ 6000 growers and 100 handlers



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## Almond Board Research Funding

Production and environmental research: since 1973 there has been a \$16.7 million research investment

→ Research forms the basis for sustainable management in almonds

- Production Research current budget ~ \$1 million, 42 projects:

- Entomology
- Horticulture
- Aflatoxin Field Research
- Plant Pathology
- Pollination



2002 Environmental Committee formed

- Current budget ~ \$1 million, 13 projects:

- Air Quality
- Water Quality
- Stewardship/Sustainability

2005 Bee Task Force formed



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## Why the California Almond Sustainability Program?

Rapidly changing regulations affecting resources and costs

- Water availability
- AB32 (Greenhouse Gas) - Energy
- Irrigated Lands, etc – Water quality
- PM10, Ozone, etc - Air

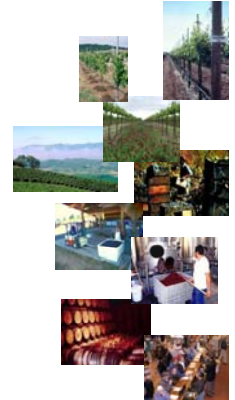


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## Self-Assessment Workbook

- Viticulture
- Soil Management
- Vineyard Water Management
- Pest Management
- Wine Quality
- Ecosystem Management
- Energy Efficiency
- Winery Water Conservation & Quality
- Material Handling
- Solid Waste Reduction & Management
- Environmentally Preferred Purchasing
- Human Resources
- Neighbors & Communities
- Air Quality



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- Modular approach:
  - 2009
    - Irrigation management
    - Fertilizer management
  - 2010 – in progress
    - Air quality
    - Energy efficiency
    - Pest management
  - Additional modules in 2011 and beyond



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- 2009 launch - stakeholder collaboration:
  - SureHarvest Inc. drafted modules
  - Review by:
    - UC Cooperative Extension
    - UC & CSU researchers
    - NRCS staff
    - crop consultants
    - irrigation specialists
    - Pest Control Advisors
  - Grower pilot “review by doing meetings”



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## Self-Assessment Format

B	Irrigation Scheduling	Not Familiar With	Have Tried It	Currently Use
B.1.	For my orchard, I am using the following practices and/or technologies for determining when to irrigate:			
1	I irrigate on a regular schedule/interval of my choice.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	I irrigate based on my water district's delivery schedule.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	I irrigate following historical ET.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	I irrigate following real time evapotranspiration (ETc) data at least weekly and calculating the water volume leaving the plant and soil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	I decide when to irrigate based on visual plant stress.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	I decide when to irrigate based on measured plant stress:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.a.	Monitoring plant water stress with other methods (remote sensing, canopy temperature, etc).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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## Self-assessment, not survey

- Repetition
- Feedback mechanism

Note: Individual grower data is confidential; protected as trade secrets  
 Cumulative data is available to ABC to dialogue with stakeholders

**CALIFORNIA SUSTAINABLE WINEGROWING ALLIANCE**

enter keywords **SEARCH**

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**SWP PARTICIPANTS**  
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**California Sustainable Winegrowing Program**  
Benefiting the environment, the community and high quality grapes and wine.

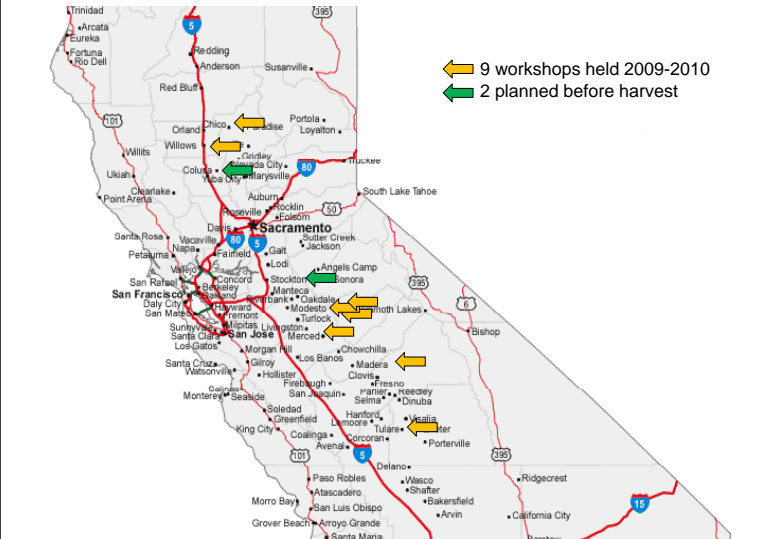
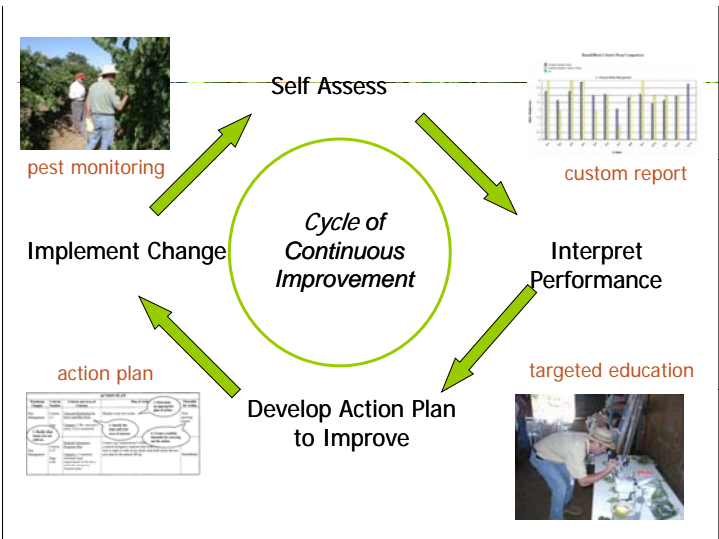
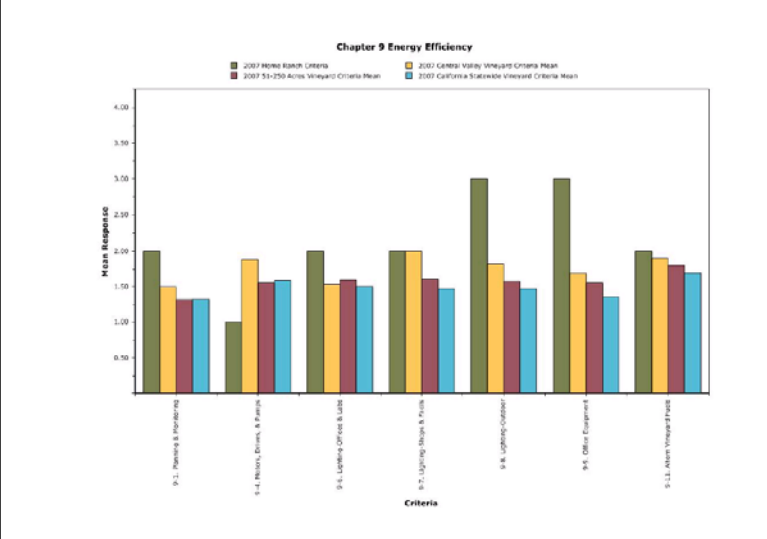
"The beauty of the California Sustainable Winegrowing Program is its simplicity: a couple of hours for the self-assessment questions, then you review the results and pick the areas that you want to improve first. With the new, on-line version, it is even quicker and easier."

**Bill Cooper**  
CSWA Board Member - Cooper-Garrod Vineyards

**NEW: How Sustainable is Your Operation?**  
Do an Online Self-Assessment!  
To self-assess your vineyard and/or winery operations using the second edition workbook online, generate your own customized sustainability reports to identify areas of strength and opportunities for improvement, and take advantage of other benefits of participation, visit our [online Self-Assessment](#).  
(Only California vintners and growers may self-assess online.)

**Attend an Upcoming Workshop!**  
To find a workshop in your area to assess or reassess your operation and to learn more about specific practices, visit our [Workshop Calendar](#).

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**Results thus far**

- Farmers appreciate the opportunity to “tell their side of the story”
- 56 operations self-assessed
  - Small sample set
  - Following examples not meant to be a statistical representation of the industry

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**Example – Farm Size:**

- Median – 200 acres
- Minimum – 7 acres
- Maximum – 11500 acres

**Example Irrigation type (by grower):**

- Flood/furrow: 14%
- Sprinkler: 29%
- Micro-sprinkler or drip: 54%

**Example Irrigation type (by acres):**

- Flood/furrow: 6%
- Sprinkler: 7%
- Micro-sprinkler or drip: 85%



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### Example – use of irrigation scheduling technologies

- Real-time ET (evapotranspiration) data: 41%
- Pressure chamber to measure plant stress: 18%
- Use of soil moisture probes/devices: 52%

### Example – other insights

- 20% of growers have to base their irrigation timing and amounts on a water district delivery schedule
- 66% of growers report using fertigation to apply nitrogen



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## Bringing it all together

- Ongoing research funded by ABC:
  - Combination of micro-irrigation, fertigation, & best scheduling technologies can result in 70% to 80% N efficiency – among highest ever measured in ag
  - Self-assessment process + research = target education at the practices which will yield highest return for growers and environment



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## Key Consequences

- Policymakers should know that ABC has embarked on this self-assessment process:
  - Collecting data
  - Engaging growers with best management practices information
  - Data will be used to dialogue with stakeholders



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