Eco Grape Production: Sustainable Vineyard Practices

Spring Vineyard School
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SureHarvest
Presentation Outline

- Challenges to implementing sustainable winegrowing
- Define Sustainable Agriculture – Historical context
  - How integrated pest management fits in
- Implementing Sustainable Winegrowing in the vineyard – A case study of Lodi’s program
Three Challenges for Implementing a Sustainable Farming Program

1) Defining it:
   • How can I do it if I can’t define it?
   • What are the boundaries of the definition?
   • There are no universally accepted standards

2) Implementing it:
   • What can I do to on my farm?
   • How do we extend this to an entire sector/region?

3) Measuring it:
   • Tracking practices – where am I at?
   • How is it impacting my farming operation?
   • Environmental performance measures?
Defining Sustainable Agriculture

Leaving the earth in as good a condition for the next generation as we found it, and by allowing others to take an inheritance of the earth, to make the planet a better place for the next generation to meet their own needs.

- 1987 United Nation’s Brundtland Commission
History of Sustainable Agriculture

**History of Organic Farming:**

- Organic farming evolved in the 1920’s, 30’s & 40’s
- Rudolf Steiner’s 1924 lectures that led to Biodynamic farming
- Sir Albert Howard in 1940’s promoted the importance of humus and good soil fertility
- Word ‘organic’ first used in 1940’s in reference to sustainable agriculture by Lord Northbourne
  - Return crops by-products soil and use animal manures, too.
  - Concerned about negative affects of synthetic fertilizers and pesticides on soil
  - Farm is a dynamic, balanced, living organic whole
Green Revolution evolved in 50’s-60’s

• emphasis on genetically enhanced plants
• high energy off-farm inputs such as:
  - mechanization
  - synthetic pesticides
  - synthetic fertilizers

Questions arose beginning in the 1970’s about long-term ‘sustainability’ of this approach

Sustainable farming continued to evolve as alternative to ‘industrial’ agriculture
The Evolution of Pest Management & IPM
(How we got to present day attitudes & practices)

Pest management practices prior to WW II:

- Use of cover crops
- Till soil to reduce weed populations
- Crop rotation
- Some biological control programs
- Use of resistant rootstocks for phylloxera
- Inorganic pesticides like Bordeaux mixture, nicotine, lime-sulfur
Things really changed around WWII

Discovered nerve gases killed insects, too.

Discovered pesticidal properties of chloronated hydrocarbons, e.g. DDT

Why did DDT have such an impact?

• it was cheap
• it killed everything
• it was effective for a very long time
• it went on in small amounts
• it didn’t kill people
DDT was new technology!

- Growers had to be shown how to use it
- Who better than the chemical industry to show them
- Control was spectacular at first!
- Some thought pests would be eradicated

Pest control evolved into answering just 2 questions:
1) What do I spray
2) How do I apply it
Problems began to appear….

- Pesticide resistance
- Secondary pest outbreaks
- Non-target organisms affected
- Human health problems
- Environmental contamination
We Had Reached a Pest Management Crisis

• Some pests could no longer be economically controlled

• We had forgotten that pest problems are ecologically-based and therefore are best managed using ecological principles

• Entomologists at the University of California developed IPM to meet the crisis
The Integrated Control Concept was Formalized in 1959

What is IPM?

IPM is a sustainable/long term approach to managing pests by combining biological, cultural and chemical tools in a way that minimizes economic, environmental and health risks.
The 5 essential components of an IPM Program:

1) Understand crop ecology
2) Understand pest ecology (and natural enemies)
3) Monitoring for pests
4) Use of economic thresholds
5) Consider control options (based on minimizing economic, environmental and health risks)
Defining Sustainable Agriculture

American Agronomy Society:

A sustainable agriculture is one that, over the long term, enhances environmental quality and the resource base on which agriculture depends; provides for basic human food and fiber needs; is economically viable; and enhances the quality of life for farmers and society as a whole.
Defining it - Sustainability Principles for the California Wine Industry

The three “E’s” of Sustainability

- Environmentally Sound
- Economically Viable
- Socially Equitable
Thoughts to Ponder about Sustainability

• Organic and Biodynamic were codified a long time ago, Sustainable Ag is not codified

• Growers implementing sustainable farming are not in transition to organic or Biodynamic

Why?

What are the current issues?

• Water use
• Energy use
• Air quality
• GHG & climate change
• Human resource issues
What is Sustainable Winegrowing?

- It focuses on all aspects of farming
  - Soil
  - Water
  - Grapes
  - Air
  - Energy use
  - Areas not farmed
  - Family, employees and community
  - Economics

- It is best viewed as a continuum

- One can always improve

Where does one draw a line?
Things to Consider About Sustainable Winegrowing

- It is a business model to apply to one’s farm
  - If you can’t measure it, you can’t manage it

- Sustainable farming is a journey, it is not a destination

- The world of sustainable farming is one where the horizon is always seems to be receding!

- Price of crop will dictate what can be implemented
Sustainable Winegrowing

Defining it, implementing it, and measuring it

Lodi Winegrape Commission’s Sustainable Winegrowing Program: A case study
Location of Crush District #11:
Timeline for LWC’s Sustainable Winegrowing Program

Stage I
Grower Outreach (IPM) 1992

Stage II
In-Field Program (BIFS) 1996

Stage III
Area-wide Program 1999

Stage IV
Sustainable Certification Program 2002

Education

Demonstration

Self-assessment

Standards Present

Lodi Winegrower’s Workbook
Location of Lodi AVA:
What is the Lodi Winegrape Commission (LWC)?

- All 750Growers in Crush District #11
- Voted in by growers in 1991
- Funded by assessment of grape crop
- 100,000 acres of winegrapes - 20% of CA production
- North America’s leading producer of Cabernet Sauvignon, Merlot, Zinfandel, Sauvignon Blanc, and Chardonnay (farmgate value $US250 Million/year)
Why was LWC formed?

• Market Lodi as a producer of premium wine grapes and wine
• Fund viticulture research to solve local problems
• To develop an area-wide sustainable wine growing program
Stage I - Grower Outreach

- Breakfast meetings
- Half-day research seminars
- Field days
- Neighborhood grower meetings
- Newsletter (6 per year)
- Website – www.lodiwine.com

- Directed at entire LWWC membership
- Appeal to the complete range of LWWC growers
- Emphasize farmer to farmer education
Stage II - Field Implementation-BIFS

- Core group of 45 growers (40% of acres)
- Involves 14 PCAs (> 50% of district)
- 70 BIFS vineyards (2,600 acres)
  - work one on one with growers & PCAs
  - implement specific sustainable practices
  - weekly pest monitoring
  - track everything that happens in vineyard
  - share information among growers & PCAs

*Biologically Integrated Farming Systems*
What does a grower self-assessment accomplish?

- identifies good farming practices being done
- identifies farming practices that are of concern from an environmental and/or wine quality perspective
- development of action plans to address these concerns
- set time table to carry out action plans

It is a tool for Defining, Implementing, and Measuring Sustainable Viticulture
Workbook Technical Advisory Committee

Markus Bokisch, LWC Grower & Winemaker
Joe Dexter, LWC Grower & Winemaker
Dr. Nick Dokoozlian, E & J Gallo Winery Chief Scientist
Aaron Lange, LWC Grower & Winemaker
Brad Goehring, LWC Grower
Stan Grant, Viticulture Consultant
Dr. Doug Gubler, UC Davis Plant Pathologist
Dr. Will Horwath, UC Davis Soil Scientist
Robert Pirie, LWC Grower
Terry Prichard, UC Davis Irrigation Specialist
Gary Patterson, LWC Grower
Steve Quashnick, LWC Grower & PCA
Kent Reeves, Wildlife Biologist, EBMUD
Dr. Liz Thach, CSU Sonoma Human Resources
Bill Thomas, Mid Valley Ag PCA
Paul Verdegaal, Farm Advisor UCCE
Lodi Winegrower’s Workbook 2nd Edition Content

- Introduction
- Ecosystem Management
- Vineyard Establishment & Replanting
- Viticulture
- Soil Management
- Water Management
- Pest Management (IPM)
- Human Resources Management
- Shop & Yard Management
- Wine Quality & Customer Satisfaction

Defined 160 Critical Issues

= whole farming system approach
### 6.9 Managing omnivorous leafroller (OLR)

<table>
<thead>
<tr>
<th>Category 4</th>
<th>Category 3</th>
<th>Category 2</th>
<th>Category 1</th>
</tr>
</thead>
</table>
| I do not have to treat for OLR because parasites keep the population below the economic threshold.  
*Or*  
If control is necessary due to problems in the previous season, I use pheromone confusion for control. | I check 10 flower clusters on 20 vines at bloom time for treatment decision-making  
*And*  
I obtain a biofix for OLR using a pheromone trap, and degree-days are tracked using weather station data  
*And*  
Treatment is timed for 700-900 degree-days from biofix (the most susceptible stage)  
*And*  
I use LWWC’s PEAS model in selecting the pesticide to use for OLR taking into account the environmental impact units (EIUs) and efficacy. | My treatment for OLR is based on the time of year or stage of grapevine development (e.g. bloom)  
*And*  
I use LWWC’s PEAS model in selecting the pesticide to use for OLR taking into account the environmental impact units (EIUs) and efficacy. | My treatment for OLR is based on the time of year or stage of grapevine development (e.g. bloom)  
*And*  
Environmental impact is not considered when I choose a pesticide to use for OLR. |

**Increasing Sustainability**

Ultimate IPM

No IPM
## Example Evaluation Sheet from Pest Management Section

<table>
<thead>
<tr>
<th>Issue</th>
<th>Pg No.</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
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<tbody>
<tr>
<td>6.6 Economic threshold for leafhoppers</td>
<td>210</td>
<td>✓</td>
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<td>6.7 Economic threshold for Willamette mites</td>
<td>211</td>
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<tr>
<td>6.8 Economic threshold for Pacific mites</td>
<td>211</td>
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<td></td>
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<td></td>
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<tr>
<td>6.9 Managing omnivorous leafroller</td>
<td>215</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6.10 Managing grape leaffolder</td>
<td>217</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>6.11 Mealybug management</td>
<td>218</td>
<td></td>
<td>✓</td>
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### Example Action Plan

**ACTION PLAN**

<table>
<thead>
<tr>
<th>WORKBOOK SECTION</th>
<th>ISSUE NO.</th>
<th>ISSUE &amp; AREA OF CONCERN</th>
<th>PLAN OF ACTION</th>
<th>TIMETABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pest Mgt Chapter</td>
<td>6.9 on pg 215</td>
<td>Managing OLR: Cat. 2. Treatment is based on time of year (calendar-based)</td>
<td>Move to Cat. 3 by sampling flower clusters for larvae and if spray is necessary use biofix from pheromone trapping to time it.</td>
<td>Start next growing season</td>
</tr>
</tbody>
</table>
How was the workbook program implemented?

Hold workbook workshops at growers’ homes throughout the district since 2000:

• From Jan 2000 to Jan. 2002 40 workshops were attended by 255 growers farming 63,000 acres

• From May 2002 to the present 100 growers farming 40,000 acres have been through the workbook a second time

• Database was created to summarize vineyard evaluations for growers willing to share them
Lodi Winegrower’s Workbook: Influence on California Wine Industry & Others

Workbooks now in:
- Washington State
- New York
- Michigan

Crops considering workbooks:
- Almonds
- Strawberries
- Avocados

Sustainable Vineyard & Sustainable Winery Practices
Stage IV: Sustainable Winegrowing and the Marketplace - 2002

www.lodirules.com
The Lodi Rules for Sustainable Winegrowing – What Is It?

- California’s first peer-reviewed, 3rd party-certified sustainable winegrowing standards
- It supports LWC’s goal to continually improve Lodi’s reputation for quality grapes & wine
- It is a voluntary program open to all LWC growers to certify vineyards as sustainable
- Certified by Protected Harvest, an organization with Consumers Union’s top rating
Regional Reasons: LWC Goals

- Market Lodi as a producer of premium wine grapes and wine
- Fund viticulture research to solve local problems
- To develop an area-wide sustainable winegrowing program
Reasons for individual grower – **Financial Benefits?**

- **Increased grape prices!!!**
  - Michael-David Vineyards paying a 10% bonus for certified grapes, Bogle $25/ton

- **10% Reduction on Insurance Premiums**
  - Pan American Underwriters

- **New winegrape contract?**

- **Increased wine sales?**
What is the Protected Harvest Model?

To be Certified a Vineyard Must:

- Exceed a minimum number of sustainable farming practices points – practices are crop and regionally specific
- Not exceed a maximum number of environmental impact units from pesticides (synthetic and organic) used in the vineyard
- Crop specific & Regional specific farming standards
- Each vineyard must qualify each year
Sustainable Winegrowing Practices Standards

- Ecosystem management - 12
- Education, Training & Teambuilding
- Soil Management - 13
- Water Management - 11
- Vineyard Establishment
- Pest Management - 18
Growth in Acres of Certified Winegrapes

Acres

<table>
<thead>
<tr>
<th>Year</th>
<th>Acres</th>
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<tbody>
<tr>
<td>2005</td>
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<td>2006</td>
<td>5424</td>
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<td>2007</td>
<td>7628</td>
</tr>
<tr>
<td>2008</td>
<td>10025</td>
</tr>
<tr>
<td>2009</td>
<td>15000</td>
</tr>
</tbody>
</table>
Winery Participation

- Bogle
- Bokisch
- Delicato
- Grand Amis
- Herringer
- Herzog Wine Cellars
- Lange Twins Wine Estates
- Lobo Loco Winery
- Michael-David Winery
- Peltier Station
- Ripken Winery
- St. Amant Winery
- Valhalla Cellars
- Vino Combrio Winery
Sustainable Farming: It Begins with a Sustainable Plan/Vision for the Farm

If you don’t know where you are going;

You may end up someplace else

- Yogi Berra

Why is this important?
Thank You

Questions?