Reducing Pesticide Risk: A Case Study from Lodi, California

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Lodi-Woodbridge Winegrape Commission
Presentation Outline

- What is LWWC and why was it formed?
- The Evolution of LWWC’s IPM Program
- The Evolution of LWWC’s Sustainable Winegrowing Program
- Marketplace Incentives Program
What is the Lodi-Woodbridge Winegrape Commission (LWWC)?

- All 750 Growers in Crush District #11
- Voted in by growers in 1991
- Funded by assessment of grape crop
- 90,000 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 LWWC formed?

- Market Lodi as a producer of premium winegrapes and wine
- Fund viticulture research to solve local problems
- To develop an area-wide IPM program
Sustainable Winegrowing in Lodi – 
*LWWC’s Program Stages*

**Stage I. Grower Outreach – Begun 1992**
- education

**Stage II. Field Implementation BIFS - Begun 1996**
- demonstration in the vineyard

**Stage III. Area-wide Implementation – Begun 1998**
- the *Lodi Winegrower’s Workbook* program

**Stage IV. Lodi’s Sustainable Winegrowing Program in the Marketplace – Begun 2003**
- *The Lodi Rules for Sustainable Winegrowing*
Stage I - Grower Outreach

- Breakfast meetings (~70)
- Half-day research seminars (~100)
- Field days (>100)
- Neighborhood grower meetings (5-15)
- 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 interactions
Stage II - Field Implementation-BIFS

- **Core group of 45 growers** (40% of acres)
- **Involves 14 PCAs** (> 50% of district)
- **63 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*
Results from District-wide Grower Survey 1998

LWWC Growers' Impressions of IPM

- **IPM minimizes environmental risks**
  - Strongly agree: 47%
  - Somewhat agree: 44%
  - Somewhat disagree: 9%
  - Strongly disagree: <1%

- **Broad-spectrum sprays reduced**
  - Strongly agree: 38%
  - Somewhat agree: 52%
  - Somewhat disagree: 9%
  - Strongly disagree: 1%

- **IPM reduces health risks**
  - Strongly agree: 48%
  - Somewhat agree: 46%
  - Somewhat disagree: 5%
  - Strongly disagree: 1%

- **IPM reduces chemical use**
  - Strongly agree: 48%
  - Somewhat agree: 46%
  - Somewhat disagree: 6%
  - Strongly disagree: <1%

- **IPM is effective**
  - Strongly agree: 42%
  - Somewhat agree: 52%
  - Somewhat disagree: 6%
  - Strongly disagree: <1%

- **IPM optimizes economic returns**
  - Strongly agree: 18%
  - Somewhat agree: 59%
  - Somewhat disagree: 21%
  - Strongly disagree: 2%

Legend:
- blue: strongly agree
- yellow: somewhat agree
- green: somewhat disagree
- red: strongly disagree
Stage III. Lodi Winegrower’s Workbook: A self-assessment of integrated farming practices

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 IPM & Sustainable Viticulture
Lodi Winegrower’s Workbook Content

- Introduction
- Viticulture
- Soil Management
- Water Management
- Pest Management
- Habitat
- Human Resources
- Wine Quality
- Action Plans

Defined 105 Critical Issues

= whole farming system approach
# Example Issue sheet from the pest management section

<table>
<thead>
<tr>
<th>PEST MANAGEMENT - INSECT AND MITE MONITORING AND MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue</strong></td>
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<tr>
<td>-------------------------------------------------------------</td>
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<tr>
<td>1. Vineyard Monitoring for insect and mite pests</td>
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</table>

**Notes:**

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Increasing Sustainability
## Example Evaluation Sheet from Pest Management Section

<table>
<thead>
<tr>
<th>Issue</th>
<th>Category</th>
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<tbody>
<tr>
<td>Insect and Mite Monitoring and Management</td>
<td>Page No.</td>
</tr>
<tr>
<td>1. Vineyard monitoring for insect and mite pests</td>
<td>39</td>
</tr>
<tr>
<td>2. Economic thresholds and pest-natural enemy ratios</td>
<td>40</td>
</tr>
<tr>
<td>3. Use of broad spectrum insecticides and miticides</td>
<td>41</td>
</tr>
<tr>
<td>4. Use of reduced-risk materials for OLR</td>
<td>41</td>
</tr>
<tr>
<td>5. Cultural practices for insect and mite management</td>
<td>41</td>
</tr>
<tr>
<td>6. Dust abatement in and around vineyards for mite management</td>
<td>61</td>
</tr>
<tr>
<td>WORKBOOK SECTION</td>
<td>ISSUE NO.</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Pest Management: Insect &amp; Mite Management</td>
<td>1 on Pg 56</td>
</tr>
</tbody>
</table>
How is the workbook program being 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
**Average Evaluation Score for Each Issue in Pest Management Chapter (200 Vineyards)**

**Issue:**

1. Monitoring for Hoppers and Mites:
   - I monitor every week but do not keep a written record

2. Releasing Mite Predators:
   - I do not release them

3. Timing of Mildew Treatments:
   - Treatments are applied according to experience, mentally taking weather into account
Portion of Growers Checking 4's, 3's, 2's or 1's for Each Criteria in the Pest Management Workbook Chapter (200 vineyards)
How Has LWWC's Program Affected Your Pest Monitoring?

- Monitor more frequently
- Increased monitoring for beneficials
- Monitor more systematically
- Monitor more time per trip

Percent

<table>
<thead>
<tr>
<th>Year</th>
<th>Monitor more frequently</th>
<th>Increased monitoring for beneficials</th>
<th>Monitor more systematically</th>
<th>Monitor more time per trip</th>
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<tbody>
<tr>
<td>2003</td>
<td>70%</td>
<td>62%</td>
<td>69%</td>
<td>61%</td>
</tr>
<tr>
<td>1998</td>
<td>61%</td>
<td>58%</td>
<td>53%</td>
<td>52%</td>
</tr>
</tbody>
</table>

- Monitor more frequently
  - 2003: 70%
  - 1998: 61%
- Increased monitoring for beneficials
  - 2003: 62%
  - 1998: 58%
- Monitor more systematically
  - 2003: 69%
  - 1998: 53%
- Monitor more time per trip
  - 2003: 61%
  - 1998: 52%
the LODI RULES
FOR SUSTAINABLE WINEGROWING
CERTIFIED BY PROTECTED HARVEST
Origins of The Lodi Rules

Grower committee was formed in April 2001 to review value added programs in US & elsewhere and concluded:

- Third party certification program provides most credibility
- Base program farming standards on the *Lodi Winegrower’s Workbook*
- Healthy Grown® certified by Protected Harvest was best certification model
What is the Healthy Grown Model?

To be Certified a Vineyard Must:

- Exceed a minimum number of sustainable farming practices points
- Not exceed a maximum number of environmental impact units from pesticides (synthetic and organic) used in the vineyard
Sustainable Winegrowing Practices Standards

- Ecosystem management - 12
- Education, Training & Team Building - 11
- Soil Management - 13
- Water Management - 11
- Vineyard Establishment
- Pest Management - 18
Pesticide Environmental Assessment System or PEAS

- Model Developed by Dr. Chuck Benbrook
- Calculates environmental impact index for each pesticide Active Ingredient used in Lodi
- Index is a direct measure of environmental risk
- Environmental Impact units can be added up to calculate total impact of all pesticides used on each vineyard acre
PEAS is a Multi-attribute Model

PEAS Index is made of the following indices:

- Worker exposure
- Avian risk
- Daphnia risk (measure of water quality)
- Bees (measure of natural enemy impacts)
- Dietary risk e.g. residue ingestion
- Ground water impacts added in 2005
<table>
<thead>
<tr>
<th>Pesticide</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorsban</td>
<td>173.00</td>
</tr>
<tr>
<td>Nexter</td>
<td>50.00</td>
</tr>
<tr>
<td>Copper Hydroxide</td>
<td>7.00</td>
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<tr>
<td>Neem Oil</td>
<td>5.00</td>
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<tr>
<td>Provado</td>
<td>3.00</td>
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<tr>
<td>Cryolite</td>
<td>2.94</td>
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<tr>
<td><strong>Sulfur Dust</strong></td>
<td><strong>2.37</strong></td>
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<tr>
<td>Omite</td>
<td>2.05</td>
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<tr>
<td>Surround</td>
<td>1.45</td>
</tr>
<tr>
<td>Roundup</td>
<td>0.39</td>
</tr>
<tr>
<td>Kaligreen</td>
<td>0.39</td>
</tr>
<tr>
<td>Rally</td>
<td>0.32</td>
</tr>
</tbody>
</table>
Frequency Distribution of Total Impact Units for the Year for BIFS Vineyards from 1996 to 2003
Twelve Years of Sustainable Viticulture in Lodi – *Grant’s Awarded to Program*

LWWC has received over $1.4 Million in grants for its Sustainable Viticulture Program

**Funding Sources:**
- W. K. Kellogg Foundation
- University of California SAREP
- US EPA Region IX
- National Resource Conservation Service
- US EPA PESP Grant Program
- CalFed Bay Delta Authority
- Great Valley Center
- National IPM Education Foundation
- USDA Value Added Grant Program
- State Water Quality Control Board
LWWC’s Success in the Marketplace

• In 1990 total tons 286,441 (Tokay, Zinfandel, French Colombard, Carignane, Chenin Blanc, Burger)

• In 2004 total tons 565,828 (Zinfandel, Chardonnay, Cabernet Sauvignon, Merlot, Sauv. Blanc, Syrah)

• In 1990 Lodi grew 9% of California’s winegrapes

• In 2004 Lodi grew 20% of California’s winegrapes (and 23% of California’s premium wine production)

• In 1990 there were 8 wineries in Lodi appellation and 4 ‘Lodi’ labeled wines

• In 2004 there are over 50 wineries and over 200 ‘Lodi’ labeled wines