



# INTRODUCTION

# Introduction

Welcome to the California Wine Community Sustainability Report 2004. The Sustainable Winegrowing Practices (SWP) program was initiated in 2001 with ambitious goals of building and executing the most comprehensive sustainable winegrowing practices program in the world. With the publication of this report, the program has gone through one full cycle of design, development, implementation, data collection and analysis, and reporting in just over three years. The program is now utilizing the lessons learned from the first full program cycle to improve and extend the implementation approach, add additional sustainable practices content, build new and strengthen existing partnerships, and continue measuring the adoption of sustainable practices. The overall desired outcome for the California wine community remains the same—earning the reputation as the world leader in the adoption of sustainable winegrowing practices.

The production and publication of this report is an expression of a core value and tradition of the California wine community to openly share information that contributes to the advancement of the industry as a whole. The report also allows the wine community to communicate the state of sustainable practices adoption with stakeholders including neighbors and community members, the research and extension community, government agencies, non-profit organizations, and other interested parties. This is the first time an entire sector has measured the level of sustainable practices among its members and reported the results publicly.

The report presents the results for all areas where sustainable winegrowing practices information was collected. Although the report reveals many strengths—highlighting areas where growers and winemakers are doing an exemplary job of balancing environmental, social and economic principles in how they practice their business—there are also weaknesses. Addressing these challenging areas will require time, money, innovation and, in some cases, outside expertise, new technologies, an improved regulatory framework, and partnerships.

There will be areas of practices to criticize. When you find them, please think and take action on how you as a grower, winemaker, neighbor, community member, nonprofit, government and private sector professional can help contribute to practical solutions to continual improvement and the adoption of more sustainable practices.

By design, the report presents detailed information on the level of adoption for each specific sustainable practice criterion. The report does not include detailed analysis or interpretation of the baseline level adoption of practices as high, medium, low, good, weak, etc. The appropriate time to provide evaluative analysis is when the SWP program has a second round of assessment results that then can be used to benchmark changes in practices relative to this report.

This chapter is organized into the following three major sections:

**I. About the California Wine Community**

**II. About the Sustainable Winegrowing Practices Program**

**III. How to Read this Report**

Following this chapter, the assessment results for thirteen sustainable winegrowing practices areas are presented as separate chapters. These chapters include: viticulture, soil management, vineyard water management, pest management, wine quality, ecosystem management, energy efficiency, winery water conservation and quality, material handling, solid waste reduction and management, environmentally preferred purchasing, human resources and neighbors and community. The report concludes with a chapter on lessons learned and program next steps.

## **I. About the California Wine Community**

California's wine community is integrally tied to California's land, natural resources, and workforce. Vineyards require a significant investment in financial and intellectual capital to design, plant, bring to first harvest, and then manage through time.

During the 2003 harvest, California's approximately 4,805 winegrowers provided California's 1,049 wineries with 2.86 million tons of wine type grapes.<sup>1</sup> Red wine varieties accounted for the largest share of all grapes crushed at 1.63 million tons, while white wine varieties totaled 1.23 million tons. Chardonnay was the leading winegrape variety crushed, comprising nearly one-fifth of the winegrape volume, followed by Cabernet Sauvignon, French Colombard, Zinfandel and Merlot. The farm gate value of the wine tonnage was more than \$2 billion.

Winegrapes are grown in 47 of California's 58 counties, covering 529,000 acres, with 479,000 bearing acres and 50,000 non-bearing acres. Winegrapes are the third leading agricultural crop in revenues to California farmers. California is the leading agricultural state in the nation with annual gross farm receipts at more than \$27 billion. The gross farm receipts from the nation's second (Texas \$13.8 billion) and third (Iowa at \$11.6 billion) leading states adds up to \$25.4 billion—still less than California.

California produces 92 percent of all U.S. wine with more than 250 million cases per year. Wine is the state's number one finished agricultural product. If California were a nation, the state would be the fourth leading wine-producing country in the world behind France, Italy and Spain. California wine has an economic impact of \$45.4 billion on the state, counting revenues to the wine industry and allied industries, direct, indirect, and induced economic benefits. It provides 207,550 full-time equivalent jobs throughout California.<sup>2</sup> Wineries are an important attraction for more than 14.8 million people who visit California's wine producing regions each year, generating more than \$1.3 billion in tourism expenditures. Members of the wine community understand that visitors come to experience high wine quality wines along with California's diverse and beautiful ecosystems.

More than 40 regional winegrower and vintner associations provide educational, public policy, and marketing services to local grower and winery members. These organizations often serve as the grassroots link to communities, universities and regulatory agencies, and state and national winegrape and wine associations.

<sup>1</sup>According to the California Department of Food and Agriculture in its Final 2003 Grape Crush Report.

<sup>2</sup>Economic Impact of California Wine 2004, MKF Research

## II. About the Sustainable Winegrowing Practices Program

In 2001, Wine Institute partnered with the California Association of Winegrape Growers (CAWG) to design and execute the SWP Program. This collaboration was not the first for the largest vintner and grower associations in the state but it was the most comprehensive initiative they had undertaken together. The SWP program's mission, vision and values best describe the combination of factors that motivated the California wine community to design, develop and implement a comprehensive sustainability program.

### A. MISSION, VISION AND VALUES<sup>3</sup>

#### 1. Mission

The long-term mission for the Code of SWP project includes:

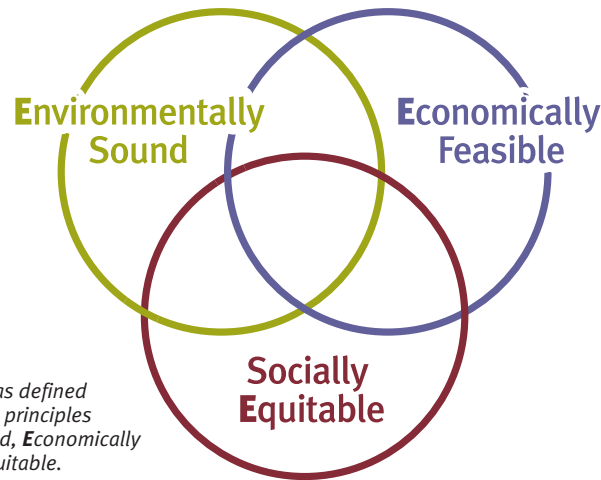
- Establishing voluntary high standards of sustainable practices to be followed and maintained by the entire wine community;
- Enhancing winegrower-to-winegrower and vintner-to-vintner education on the importance of sustainable practices and how self-governing will enhance the economic viability and future of the wine community; and
- Demonstrating how working closely with neighbors, communities and other stakeholders to maintain an open dialogue can address concerns, enhance mutual respect, and accelerate results.

#### 2. Vision

The vision of the SWP program is the long-term sustainability of the California wine community. To place the concept of sustainability into the context of winegrowing, the program defines sustainable winegrowing as growing and winemaking practices that are sensitive to the environment (Environmentally Sound), responsive to the needs and the interests of society-at-large (Socially Equitable), and are economically feasible to implement and maintain (Economically Feasible). The combination of these three principles is often referred to as the three "Es" of sustainability (see **Figure 1**).

These three principles provide a framework to pursue sustainability. However, these important principles need to be translated into everyday operations of winegrowing and winemaking. To create a bridge between general principles and daily decision-making, the workbook is organized into 13 self-assessment chapters that translate the sustainability principles into specific winegrowing and winemaking areas including: viticulture, soil management, vineyard water management, pest management, wine quality, ecosystem management, energy efficiency, winery water conservation and quality, material handling, solid waste reduction and management, environmentally preferred purchasing, human resources and neighbors and community.

<sup>3</sup>The SWP program mission, vision and values were first published in the California Code of Sustainable Winegrowing Practices Workbook, 2002, Wine Institute and California Association of Winegrape Growers, San Francisco, CA.



**FIGURE 1** Sustainability as defined by the three overlapping principles of *Environmentally Sound*, *Economically Feasible* and *Socially Equitable*.

### 3. Values

This SWP program is guided by the following set of sustainability values:

- Produce the best quality winegrapes and wine possible.
- Provide leadership in protecting the environment and conserving natural resources.
- Maintain the long-term viability of agricultural lands.
- Support the economic and social wellbeing of farm and winery employees.
- Respect and communicate with neighbors and community members; respond to their concerns in a considerate manner.
- Enhance local communities through job creation, supporting local business and actively working on important community issues.
- Honor the California wine community’s entrepreneurial spirit.
- Support research and education as well as monitor and evaluate existing practices to expedite continual improvements.

## B. BUILDING THE SWP WORKBOOK

The above stated mission, vision and values were developed along with the needed tools to execute a program to facilitate the adoption of sustainable practices. Over an 18 month period, members of Wine Institute and CAWG met monthly to define the scope of the program and then build the sustainable winegrowing practices workbook content chapter-by-chapter.

Incorporated into the 490-page self assessment workbook is the collective knowledge and experience of a 50-member committee, input from regional grower and vintner organization members and staff, and external reviewers that included researchers and farm advisors, government agencies, environmental and social equity groups.

### 1. Measurement System

The workbook includes a built-in measurement system. Participants assess their practices according to a four-category system. Category one illustrates practices which are considered to be the minimum level of sustainability for that practice but within regulatory compliance, if

regulations exist. For instance, **Table 1** illustrates the four performance categories for a criterion on “Organic Matter” in the Soil Management chapter. The categories represent increasing sustainability moving from right to left.

**TABLE 1:** Example of the 4-category Self-assessment Continuum of Increasing Sustainability

**SOIL MANAGEMENT - TILTH**

CRITERIA	CATEGORY 4	CATEGORY 3	CATEGORY 2	CATEGORY 1
<p><b>4-8 Organic Matter</b> (Skip if organic matter sufficient for your soil type)</p>	<p>A combination of organic matter is added to the soil <b>annually</b> (e.g. permanent or annual cover crop, compost, and/or manure) <i>And</i> Tillage is reduced or eliminated to lower the rate of organic matter breakdown.</p>	<p>Some form of organic matter is added to the soil <b>annually</b> (e.g. annual cover crop, compost, manure, or a combination of cover crop and manure or compost).</p>	<p>Resident vegetation is allowed to grow in the winter.</p>	<p>No organic matter is added to the soil other than what the vine produces, and resident vegetation is minimized in the winter <i>And</i> The vineyard is clean tilled.</p>
<p><i>Organic matter improves soil tilth and structure, improves aeration and infiltration, increases water-holding capacity, buffers soil pH, increases the availability of micronutrients, provides a source of plant nutrients, and feeds beneficial micro-organisms</i></p>				



The 221 workbook criteria within the 13 chapters cover everything from the “soil to the bottle” and create the context that allows the growers and vintners to utilize a decision-making model that integrates environmental, economic and social implications for wine industry practices.

**C. IMPLEMENTATION**

**1. Goals**

Once the 490-page SWP workbook was complete and officially released in October 2002, the next major task was to have individual vineyard operations and winery facilities assess their practices using the SWP workbook. The initial program goals were to have 10% of California’s 529,000 vineyard acres and 10% of the 250 million case winery production assessed using the SWP workbook in the initial round of workshops. The initial assessment goals were exceeded by 40% for winery case production (50% submitted, goal 10%) and 16.1% for vineyard acreage (26.1 submitted, goal 10%).

## 2. Approach – Workbook Workshops

The implementation plan is based on the workbook workshop model pioneered by the Lodi-Woodbridge Winegrape Commission where a local grower/winery host invited 10 or more growers and/or winemakers to a 3-hour workshop to literally have each participant go through the entire workbook and assess their practices. Many of the regional grower and vintner associations took the lead in introducing the SWP program to their members and hosting local SWP workbook workshops. The leadership of regional associations is critical to the long-term viability and success of the SWP program to facilitate continual improvement in the adoption of sustainable practices.

## 3. Statewide Baseline Dataset

### *a. Data Collection and Participation Results*

Seventy-two workbook workshops were held over a 17-month period from November 2002 through April 2004. Workshops have been held in 24 counties covering every major winegrowing region of the state. Over 1,000 growers and/or winemakers participated in an SWP workbook workshop. More than 800 vineyard enterprise and 125 winery facilities were represented at workshops. At the conclusion of each workshop, participants are asked to voluntarily submit their assessment results to contribute to the development of vineyard and winery baseline datasets. Collected assessments were entered into a relational database software application (SWP software) that included the county and larger winegrowing region for vineyards. Vineyard and winery participation results are presented in **Table 2** and **Table 3**.

**TABLE 2.** Vineyard workshop participation results

Number of Distinct Vineyard Enterprises	<b>813</b>	
Total Vineyard Acres Represented by Enterprises <sup>1</sup>	<b>223,971</b>	(42.3%) <sup>2</sup>
Number of Vineyard Acres Assessed in Workshops <sup>3</sup>	<b>137,859</b>	(26.1%) <sup>4</sup>
Number of Vineyard Enterprises that Submitted Assessment Results	<b>614</b>	(75.5%) <sup>5</sup>
Total Vineyard Acres in Dataset <sup>6</sup>	<b>124,576</b>	(23.5%) <sup>7</sup>

<sup>1</sup> Each vineyard enterprise was asked to list the total number of vineyard acres they manage.

<sup>2</sup> This number is the percent of the vineyard acres represented at workshops (223,971 acres) out of the statewide winegrape vineyard total (529,000 acres).

<sup>3</sup> Each vineyard enterprise was asked to list the number of acres they were assessing during the workshop. This number is lower than the total acres represented because most participants only assessed a portion of their vineyard acreage.

<sup>4</sup> This number is the percent of the vineyard acres assessed at the workshops (137,859 acres) out of the statewide winegrape vineyard total (529,000 acres).

<sup>5</sup> This number is the percent of vineyard enterprises that voluntarily submitted their assessment results (614 enterprises) out of all vineyard enterprise participants (813 enterprises).

<sup>6</sup> This number represents the total acres assessed and submitted.

<sup>7</sup> This number is the percent of the vineyard acres assessed at the workshops that were submitted to the statewide dataset (124,576 acres) out of the statewide winegrape vineyard total (529,000 acres).

**TABLE 3.** Winery workshop participation results

Number of Distinct Winery Facilities	<b>128</b>
Total Winery Cases Represented <sup>1</sup>	<b>145.6 million</b> (58.2%) <sup>2</sup>
Number of Winery Cases Assessed in Workshops <sup>3</sup>	<b>126.6 million</b> (50.6%) <sup>4</sup>
Number of Winery Facilities that Submitted Assessment Results	<b>86</b> (67.2%) <sup>5</sup>
Total Winery Cases in Dataset <sup>6</sup>	<b>96.8 million</b> (38.7%) <sup>7</sup>

<sup>1</sup> Each winery facility was asked to list the total number of cases they produce.

<sup>2</sup> This number is the percent of the cases represented at workshops (145.6 million cases) out of the statewide case total (250 million cases).

<sup>3</sup> Each winery facility was asked to list the number of cases they were assessing during the workshop. This number is lower than the total cases represented because some participants only assessed a portion of their case production.

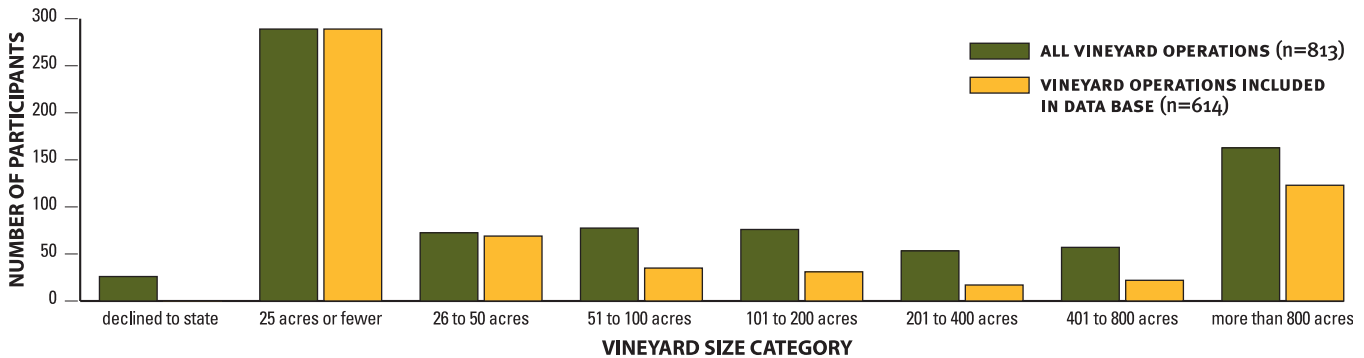
<sup>4</sup> This number is the percent of the cases assessed at the workshops (125.1 Million) out of the statewide case total (250 million cases).

<sup>5</sup> This number is the percent of winery facilities that voluntarily submitted their assessment results (86 facilities) out of all winery facilities (128 facilities).

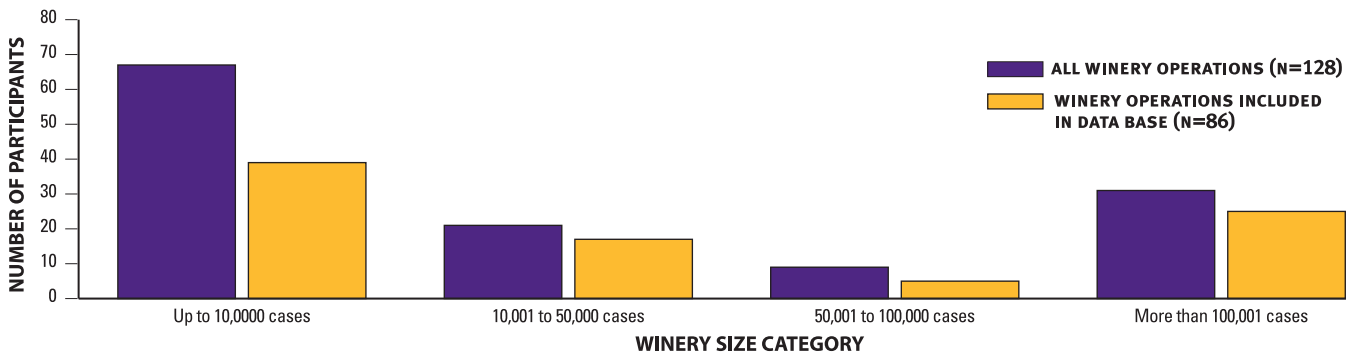
<sup>6</sup> This number represents the total cases assessed and submitted.

<sup>7</sup> This number is the percent of the cases assessed at the workshops that were submitted to the statewide dataset (96.8 million cases) out of the statewide case total (250 million cases).

The SWP assessment results presented in this report reflect a diverse range of vineyard and winery operations from many small producers to very large producers. **Figure 2** presents the size distribution for all vineyard operations that have participated in the SWP program next to vineyard operations included in the SWP data base. **Figure 3** presents the size distribution for all winery operations that have participated in the SWP program next to winery operations included in the SWP data base.



**FIGURE 2.** Size distribution in acres for all vineyard operations next to vineyard operations included in the SWP data base.



**FIGURE 3.** Size distribution in cases for all winery operations next to winery operations included in the SWP data base.

### ***b. Confidentiality of Individuals and Regions***

The SWP program assures participants that their individual information is kept strictly confidential. At no time are individual names linked to reporting results. In addition, the SWP program does not publicly report county or regional results-only statewide results. This policy was put in place to encourage statewide participation. County and regional results have been confidentially provided to regional grower and vintner associations to help them plan educational events for their members.

### ***c. Data Analysis***

Assessment results from the 614 vineyard enterprises and 86 winery facilities were entered into the SWP software. Means were calculated for each chapter from vineyard and winery criteria as well as for each vineyard and winery criteria (221 total criteria). The frequency distribution of category 4-3-2-1-N/A and missing data were also calculated for each criterion.

### ***d. Population, Missing Data and Reporting Errors***

The data presented in this report is not taken from a random sample of the overall vineyard and winery enterprise populations. Therefore, no claims are made regarding the statistical validity of the dataset relative to the entire vineyard and winery enterprise populations. However, the sample size in terms of numbers of participants (particularly for vineyard participants) and percent of acres or case produced relative to statewide totals (particularly for cases produced) are high.

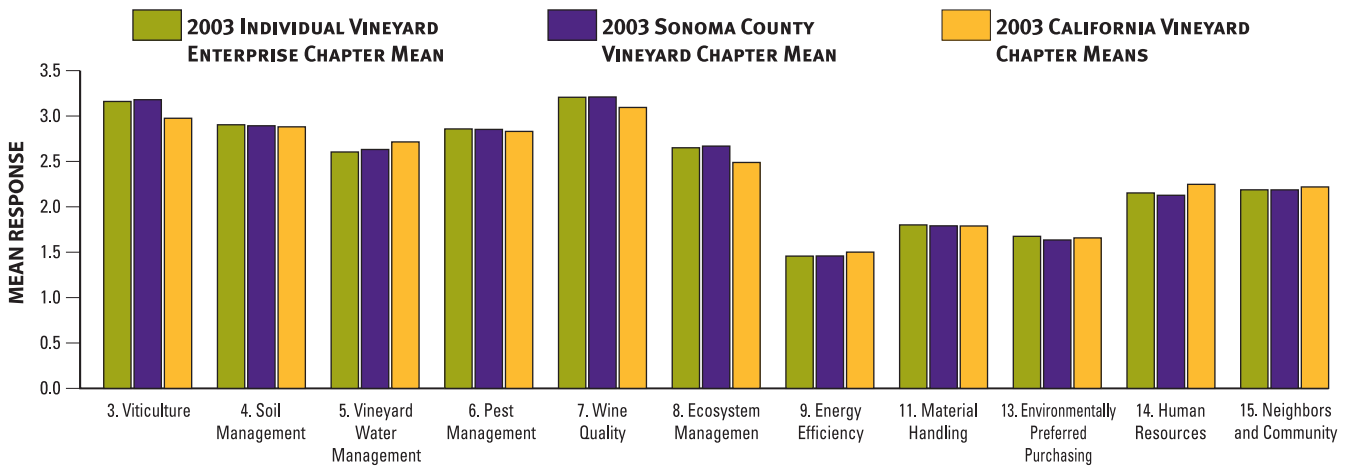
Occasionally a participant did not assess all the criteria, or may answer some criteria incorrectly. Unanswered questions create missing data and cause the response rate in the sample to be different for each criterion. Criteria answered incorrectly due to misunderstanding the directions and so forth turn up in the data as reporting errors. These create small data inconsistencies.

### ***e. Limitations in Interpreting Results***

Like all survey data, this report has limitations which should be considered when interpreting the results. It is not possible to know when responses reflect actual behavior. This disadvantage applies to all survey and assessment studies. Growers and winemakers who did not attend a workshop or turn in their assessments may differ from those that did turn in their assessments. This limitation, coupled with the fact that these results are not drawn from a random sample of growers and winemakers, means that these data are not applicable to the entire California vineyard and winery community. However, the data does represent more than 38% of the winery case production and more than 23% of the vineyard acres. The datasets also reflect a wide range of vineyard and winery sizes (**Figures 2 & 3**).

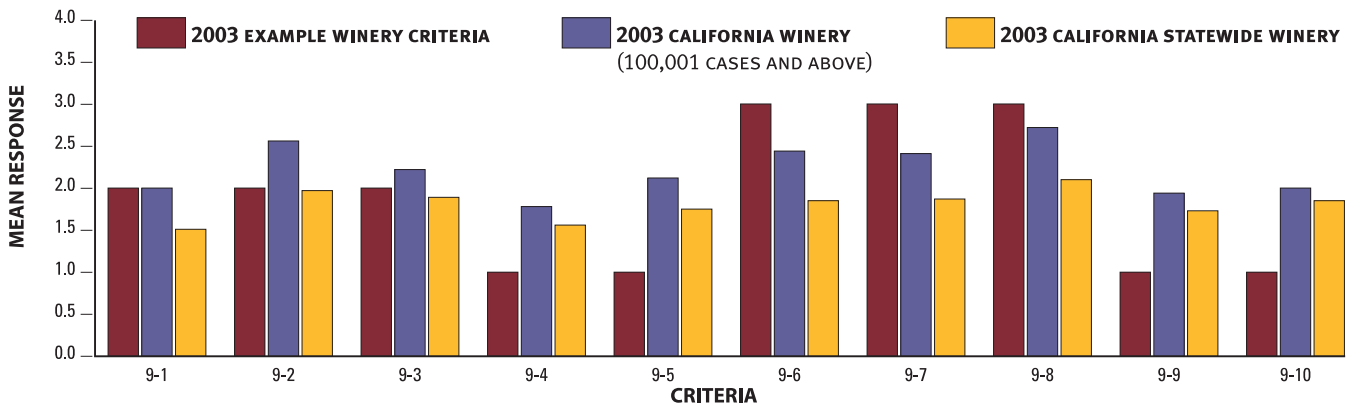
#### 4. Feedback to Workshop Participants

Vineyard and winery workshop participants that submitted their assessments were mailed confidential reports of their results compared to regional (vineyard) or size class (winery) averages and statewide averages. **Figure 4** provides an example of a vineyard Chapter Mean Report that presents an individual participant's results next to regional and statewide averages. This chapter level graph provides participants with a "big picture" of environmental, social and economic performance. By comparing their results to the regional and statewide averages, each participant can determine if they are above, below or on average with the rest of the region and the state. This allows the participant to benchmark their operation in the continuum of sustainability.



**FIGURE 4:** Example of a vineyard chapter mean report. The x-axis contains the Chapter and Criteria from the SWP workbook, for example 3\_1 represents Chapter 3, criteria 1. The y-axis contains the mean response (Category 1-4) for that question.

Participants also receive a more detailed Criteria Mean Report. **Figure 5** presents a winery Criteria Mean Report with individual participant's results, the average criteria results within their size class, and overall statewide results. This report allows participants to gain a deeper understanding of how they are doing criteria-by-criteria. This report allows participants to quickly target the areas that they want to improve so they can allocate resources to that specific effort as well as see areas where they are ahead of the curve.



**FIGURE 5:** Example of a winery criteria mean report. The x-axis contains the Chapter and Criteria from the SWP workbook, for example 3\_1 represents Chapter 3, Criteria 1. The y-axis contains the actual response for the individual winery and the mean responses (Category 1-4) for that question.

## **5. Feedback to Regions**

Confidential regional reports have been sent to most of the regional grower and vintner associations in the state. At the regional level, these assessment reports are useful because they provide a wealth of information on the practices for the region in comparison to statewide averages. Since this represents the “knowledge network” of wine industry information for that particular region, the assessment reports highlight the best practices in the region that can be rapidly disseminated throughout the region at association meetings and tailgate sessions. The reports also help the regions to target limited resources to the areas that need the most improvement. As with the individual participant reports, the Chapter Mean Comparison and the Criteria Mean Comparison helps to zero in on the areas of weakness and identify the specific practices that need attention for future improvement. The regions can help their members address key areas through the offering of Action Plan workshops such as those already underway throughout the state for pest management practices.

## **6. Statewide Results**

This report is the first distribution of the state averages for sustainable winegrowing practices from the self assessments. This information can be used to identify best practices that can be replicated throughout the state and to target resources to areas that need improvement. This outreach is dependent upon the establishment of future partnerships and generating the resources necessary to continue this valuable effort.

### ***a. Statewide Reporting Challenges***

Of course there are challenges and difficulties when a sector begins a benchmarking process. For example, there are often no established “industry standards” for environmental metrics such as kilowatts of energy per ton of product produced (e.g., grapes and wine), or waste generated per unit of production (e.g., gallon of wine). Part of the desired outcomes from this SWP program is the development of standardized units of environmental metrics that the industry can use to improve its sustainability performance.

A strength, but also a challenge, of the SWP program is that it was developed from a statewide perspective. This means that the practices, although developed by the 50-member Joint Committee of growers and vintners from across the state, are general practices that apply to all operations and cannot take into account the regional variations that exist across the state. These variations include prices per ton of grapes that vary greatly within the state, specific viticulture practices in various appellations, growing conditions that vary throughout the state and constraints like water availability, soil health, weather patterns and pests. The SWP workbook provides a general direction for sustainability but the specific roads that are traveled vary from region to region. The program recognizes that sustainability is not a final destination but an ongoing process of continuous improvement.

## 7. SWP Partnerships

**THE “BUY CALIFORNIA” INITIATIVE**, is a federal/state partnership offering competitive grants administered by California Department of Food & Agriculture (CDEA). Wine Institute



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received a competitive grant for \$280,000 which allowed the program to provide 3100 workbooks and self-assessment workshops to the California wine community free of charge.

CDEA leadership also provided extensive review of the workbook prior to publication. Their feedback provided thoughtful and detailed comments on the entire workbook that improved the quality of information and overall workbook style.

**AMERICAN FARMLAND TRUST** awarded the California Sustainable Winegrowing Alliance (CSWA) a \$150,000 competitive grant to promote and measure the adoption of integrated pest management (IPM) methods in the state and to publicly report on the progress of the SWP



project. IPM is a sustainable approach to pest control that combines a variety of tactics to prevent, avoid or suppress weeds, insects and crop diseases, while protecting human health, the environment and the profitability of agriculture. The grant is helping

support IPM-action plan workshops, data collection and the production of this report. The competitive grant was funded by the United States Environmental Protection Agency.

**UNIVERSITY OF CALIFORNIA** (UC) Board of Regents, UC Division of Agriculture and Natural Resources, and the UC Statewide Integrated Pest Management Program granted the permission to reprint 58 photographs in the workbook. The workbook program has also benefited from University of California providing longstanding research and extension contributions to generating and extending knowledge on winegrowing and natural resource management. These contributions serve as the scientific foundation upon which much of the sustainable practices presented in this workbook are based. The excellent technical and editorial comments received from UC faculty, specialists and farm advisors strengthened the content of the workbook

**CSWA DONORS** In 2002 and 2003, CSWA received approximately \$100,000 from individuals and companies for the general SWP workshops. These donors are partners in the program:

Beringer Blass Wine Estates  
Bronco Wine Company  
California Association of  
Winegrape Growers  
Canandaigua Wine Company  
Cedar Mountain Winery  
Duckhorn Vineyards  
E. & J. Gallo  
E.P. & C. Wente  
Foppiano Vineyards

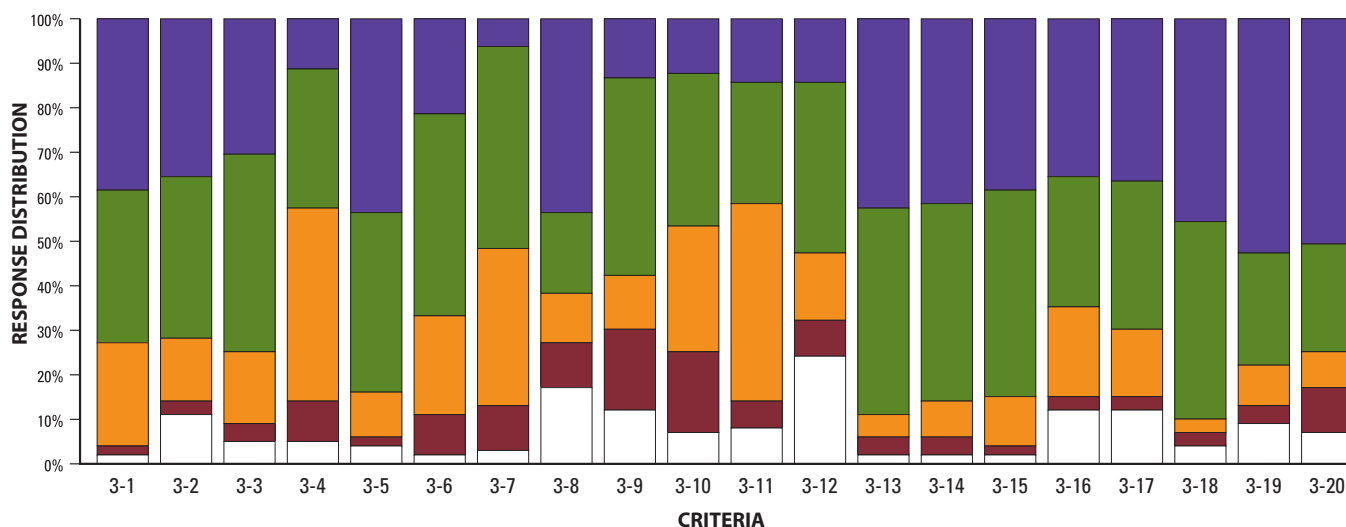
Franciscan Vineyards, Inc.  
Giumarra Vineyards  
Groth Vineyards  
Heitz Cellars  
Honig Vineyards and Winery  
Ironstone Vineyards  
J Vineyards and Winery  
J. Lohr Vineyards  
John De Luca  
Joseph Phelps Vineyards  
Mount Palomar Winery

Paragon Vineyard Company  
Paul Dolan III  
Rancho Sisquoc Winery  
Saintsbury  
Scheid Vineyards, Inc.  
Simpson Meadow Winery  
Vie-Del Company  
Weibel Vineyards  
Wine Group, Inc.  
Woodside Vineyards

### III. How to Interpret the Assessment Chapter Results and Targets

The following 13 chapters of this report present the assessment results for each of the 221 criteria in the 13 assessment chapters of the SWP workbook.

Each chapter includes a graph, illustrating the percent distribution of responses from the winegrowers and/or vintners (**Figure 6**). Each chapter also includes a “Background” section, which provides an overview of current practices, followed by a detailed examination of the responses to each criterion in the workbook.



**FIGURE 6:** Example of a percentage distribution response graph. The x-axis contains the Chapter and Criteria from the SWP workbook, for example 3\_1 represents Chapter 3, Criteria 1. The y-axis shows the percentage breakdown for each question among five possible answers (N/A, & Category1 through 4). The length of each color shows the percent response frequency.

To provide a visual concept of percentages for each question, a single bar graph has been placed in the margin next to the question being discussed. So, the bar graph for question 3-1 will be found in two places: once towards the beginning of the chapter in the “Response Distribution” graph and again in the margin next to the individual question 3-1. Some questions were asked of both growers and vintners and the corresponding bar graphs are shown in the margins on each side of question, growers in the left margin and vintners in the right margin.

When reading the criteria benchmark text, an observant reader may find percentages adding to more than 100%. There are two reasons for this; one is that the percentages are nested with a topic. For example if 50% use cover crops, and of those, 50% use rye and 50% use mustard, then the reader should realize that of all respondents, 25% use rye and 25% use mustard. The other reason is that a particular category may include practices in the category below. For example for Chapter 10 Criteria 2, yearly water quality testing is required for Category 2, Category 3 and Category 4. Therefore all answers above Category 1 could be reported as including water quality testing.

When interpreting the results between criteria it is very important to consider that the criteria are not all scaled the same, meaning that category “4s”, “3s”, “2s” and “1s” between criteria, and more importantly across chapters, do not represent the same level of sustainability. For example, it may be much more difficult to implement a category “3” or “4” for some criteria. This is especially true for chapters 8 through 15, the winemaking chapters created for the SWP workbook.

“Best Practices” is the next section found in each chapter. These vignettes illustrate current practices at wineries and vineyards in California and include personalized accounts of individual efforts on a path to sustainability.

At the end of every chapter is another graph, depicting targets for 20% continual improvement measured by the mean response for each criterion that is below “3”. For questions that had a mean of “3” or above, the 20% target is not included. These practices are well on their way to being sustainable and the overall goal for those not specifically illustrated is to demonstrate continuous improvement by the next report.

