

# Defining SUSTAINABLE VITICULTURE from the PRACTITIONER PERSPECTIVE

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Sustainability is a central topic of discussion in the viticulture and wine industry. But what is the definition of sustainable agriculture? More important, how can definitions be practically used to help solve the very real ecological, economic, and social problems facing modern agriculture, including viticulture?

Defining sustainability is a challenge, because agricultural systems are complex and dynamic, and involve many stakeholders with different goals and values. For this reason, the question: "What is the definition of sustainable agriculture?" can lead to too much ideological debate and too little action. All the while, agriculture is faced with many economic insecurities, ecological challenges, and social inequities that demand immediate attention.

Definitions have the potential to guide our responses to these problems, but only if they adequately reflect real agricultural needs and realities. By asking, "What definition for what

Any discussion of sustainability must clarify what is being sustained, for how long, for whose benefit and at whose cost, over what area, and measured by what criteria? —Jules Pretty<sup>1</sup>

purpose?" we can obtain an action-oriented definition that helps solve real problems.

Definitions of sustainable agriculture must include what is to be sustained and for how long, for whose benefit, at whose cost, in what geographic space, and by which means. These definitions must also specify how progress will be measured. These questions take agricultural sustainability in context, and their answers provide insight into how to best achieve on-the-ground results.

With several well-developed sustainability programs, California is a good place to explore the meaning of sustainability in viticulture. Notable programs with regional focus include the Central Coast Vineyard Team's Sustainability in Practice certification, Lodi Winegrape Commission's Lodi Rules for Sustainable Winegrowing

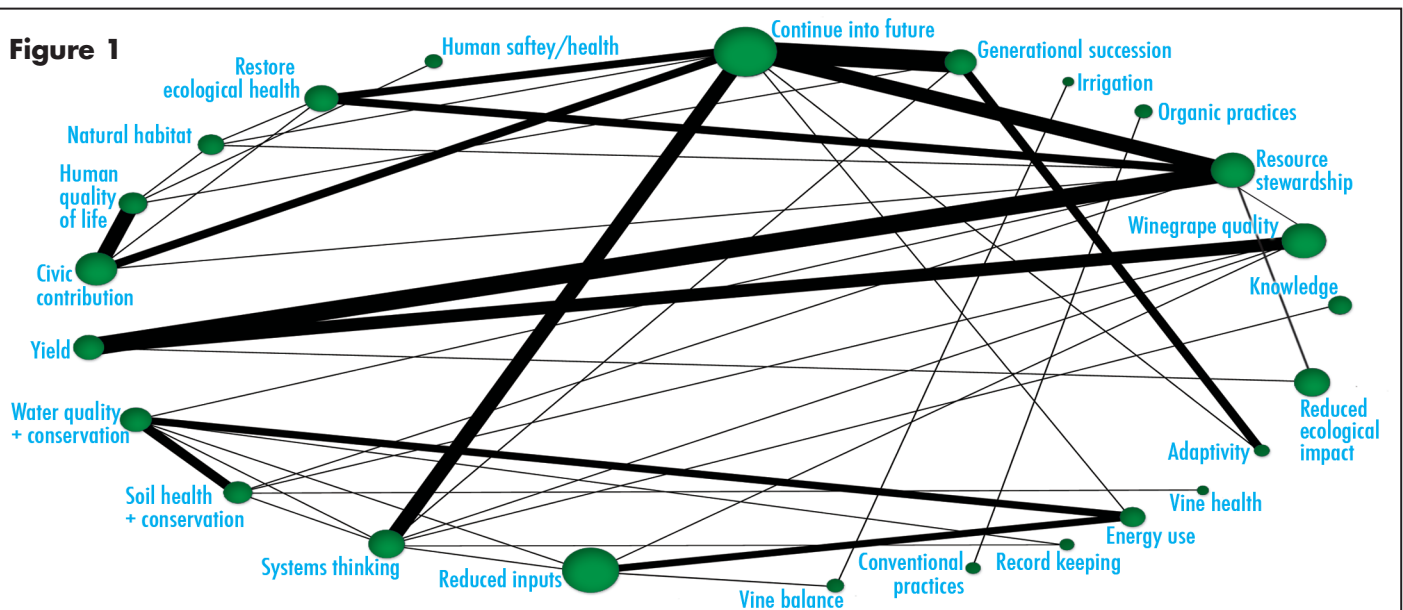
certification, and Napa Green certification. As of 2010, these three programs certified a total of 46,680 acres of winegrapes.

Other programs include Fish Friendly Farming, which focuses on ecological stewardship of viticultural and other agriculture land in the North Coast region. The California Sustainable Winegrowing Alliance has a statewide Sustainable Winegrowing Program and Certified California Sustainable Winegrowing certification.

In California, grower participation in sustainability programs correlates with the increased adoption of sustainability practices<sup>2</sup> and that outreach professionals report such programs to be effective at promoting further adoption of sustainability practices, reducing environmental risks, improving relationships between the viticulture sector and regulatory agencies, and increasing communication among growers.<sup>3</sup>

The findings presented below come from a series of studies that analyzed definitions of sustainable agriculture from two categories of viticulture practitioners: outreach professionals and winegrape growers. Outreach professionals provide management advice to growers and include pest control advisers, extension agents, university researchers, viticulture consultants, producer group staff, and sustainability program staff.

Figure 1



The first study (conducted by the lead author in 2008) analyzed data from interviews with 14 growers participating in the Lodi Rules for Sustainable Winegrowing certification program. The second study (conducted by all three authors in 2010) analyzed data from 108 outreach professionals collected through a California-wide survey and from interviews with 16 growers across the Central Coast, Lodi, and Napa Valley regions. Open-end interview and survey questions asked practitioners to define sustainable agriculture in their own words.

Definitions from the California-wide study were coded to extract themes (shown in Figure 2). For example, the **bold** section in the following grower definition was coded for “civic contribution” (among other themes). “I strive to continually reduce my impact on the environment, treat my employees with fairness and respect, **make a positive contribution to my community**, grow high-quality winegrapes, and make enough profit to be able to live a good life and pass my family farm onto the next generation of agriculturalists in as good or better shape than I found it.” Network analysis was used to identify relationships between themes.

Definitions from the Lodi study were qualitatively analyzed to identify relationships between themes, and quantitatively analyzed to produce theme frequencies and distributions.

**Three Es of sustainability**

Definitions of sustainable agriculture are useful and important, as theories and concepts often end up influencing people’s beliefs and actions. In California’s viticulture sector, the “Three Es” – economic viability, environmental health, and social equity – are commonly used definitions.

Figure 3 shows the themes identified in definitions collected by the California-wide study ranked by the percentage of respondents who included each theme. The aspects of the Three Es were mentioned more frequently than other theme. Explicit mention of the concept itself was the sixth most frequently mentioned theme. This suggests that the Three Es definition has a strong effect on practitioner thinking about sustainability.

One grower says, “I think the Three Es is a very useful concept for viticulture on farms of all sizes. I also think it is useful to pretty much anything anybody does because we tend to not look at anything we do as a system; we tend to look at the point or the proximate event that we are dealing with.”

**Economic viability is an essential aspect of sustainability**

The most prevalent theme in practitioner definitions of sustainable agriculture across both studies is economic viability. “If you are not economically viable, you are not sustainable,” says one grower. Another grower adds, “If we are not economically viable, we won’t be on our land to farm in the future.”

In the Lodi Rules study, all 14 growers addressed economic viability in their definition, and six growers began their definition with economic viability. Results from the California-wide study in Figure I show economic viability to be the most frequent theme at 59%. In the practitioner’s view, economic viability is an absolutely necessary aspect of sustainability in modern agriculture.

**Theme network of sustainable agriculture**

A theme network<sup>4</sup> conceptualizes how viticulture practitioners define and perceive sustainability. It represents their cognitive framework,

which they use to interpret their world and make decisions.

Theme networks consist of “nodes” and “ties.” Nodes represent different themes found in practitioner definitions of sustainable agriculture. Ties represent co-occurrence of themes in a given definition. A tie exists between two nodes when they are jointly mentioned in one definition. Theme networks are useful tools to understand the relationship between human cognition and social behavior.

Figure 1 represents the theme network of sustainable agriculture from the California-wide study. The larger the node, the more frequently the theme was mentioned. The thicker the tie, the more frequently the two themes co-occurred.\* By observing node size, we see that, continuing into the future, resource stewardship, winegrape quality, reduced environmental impact, reduced inputs, and civic contribution were among the most frequently occurring themes.

By observing the thickness of the ties, we see the following pairs as being among the most frequently co-occurring themes: continuing into

\* Because the themes of economic viability, environmental stewardship, and social equity are very general, they are removed from Figure 2 in an effort to focus attention on more specific themes.

CORE THEME SET	PERIPHERY THEME SET
Adaptively	Biodynamic practices
Civic contribution	Conventional practices
Continue into future	Efficiency
Energy use	Human safety
Generational succession	IPM
Habitat conservation/restoration	Irrigation
Improve ecological function	Knowledge
Reduced inputs	Organic practices
Resource stewardship	Pest control
Systems thinking	Vine health
Water quality/conservation	Quality of life
Winegrape quality	Record keeping and analysis
Yield	Recycling
	Reduced environmental impact
	Regulation compliance
	Soil health/conservation
	Vine balance

Figure 2

## GRAPEGROWING

the future and generational succession, continuing into the future and resource stewardship, continuing into the future and systems thinking, resource stewardship and yield, and winegrape quality and yield. Isolated themes that did not co-occur with other themes were removed. Now we can begin to quantifiably understand how practitioners perceive and define sustainable agriculture.

Using statistical methods,<sup>5</sup> we have identified a core set of themes that are more strongly connected to other themes, and a periphery set of themes that are less strongly connected. Figure 2 lists the “core” and “periphery” themes.

Centrality is a statistical measure of the number of ties a given node has to other nodes. Nodes with more ties to other nodes have a higher degree of

centrality. Continuation through time was the most central theme. Resource stewardship, systems thinking, yield, generational succession, and water quality and conservation were the next most central themes, respectively.

### **Continuing through time as an overarching theme**

One important theme in practitioner definitions of sustainable agriculture across both studies is the idea of continuing into the future. One grower says: “You have to think long-term.”

Figure 1 and Figure 3 show that continuing through time was the fourth most frequently occurring theme. This is interesting considering that a 1996 review of scholarly definitions of sustainable agriculture recommended that if definitions are

to be useful for guiding change, they ought to recognize the literal meaning of sustainability – the idea of continuing through time.<sup>6</sup>

According to that study, “Regardless of the merits of goals and ideals frequently incorporated into definitions of sustainability, if the idea of continuing through time is omitted, then those ideals and goals are something other than sustainability.”<sup>6</sup>

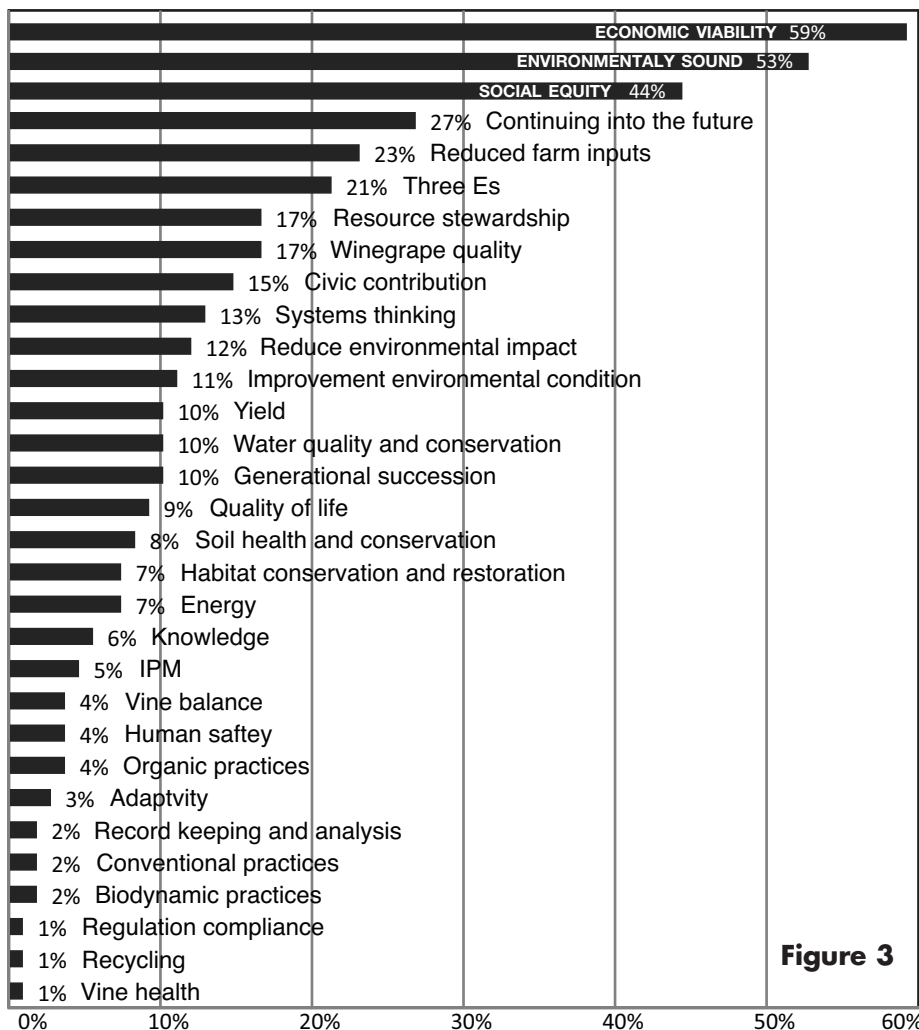
Lodi Rules growers frame sustainability in terms of generational succession of ownership and management of the family’s farm enterprise. One grower states: “I want to see vineyards on my land, and I want to see my kids on my land.”

Twelve of 14 Lodi Rules growers who were interviewed stated that sustainability means providing an opportunity for their children to continue farming.

The many generations of Lodi Rules growers’ families that have been involved in farming suggest that agricultural legacy is a defining characteristic of the region. Thirteen growers interviewed were from multi-generational farming families, including eleven who have been farming in Lodi during that period. All expressed aspirations to see their family’s agricultural legacy continue with the next generation. The mean number of generations in agriculture was 3.5, and the mean number of generations in Lodi agriculture was 2.8.

Ecological health and social equity are viewed as resources for stewardship, and economic viability as a necessary objective, but all three are viewed as playing a cumulative and supporting role in achieving the ultimate goal of generational succession. The California-wide study reinforces this finding. Figure 2 shows the themes of continuing into the future and generational succession are frequently co-occurring themes in practitioner definitions.

Figure 4 summarizes results of our studies and provides a practical framework for sustainability that shows how practitioners perceive relationships between ecological health, economic viability, social equity, and generational succession. Ecological health and social equity provide functions that help sustain



**Figure 3**

economic viability for the long-term. Thirteen growers (from the Lodi Rules study) stated that economic viability enables resource stewardship. They see economic viability as a necessary condition to enable viticulture management to support ecological health and social equity, and for generational succession.

Agriculture is fundamentally a human activity. Therefore, the next generation of farmers is essential. Lodi Rules growers expressed that they wanted to pass on to their children more than a title to their land, vineyards, and equipment. They want to give them an economically viable farm enterprise capable of producing a livelihood. They want to offer their children an attractive and realistic opportunity to continue the family's way of life. The final decision is left to their children, but they take it upon themselves to provide the opportunity.

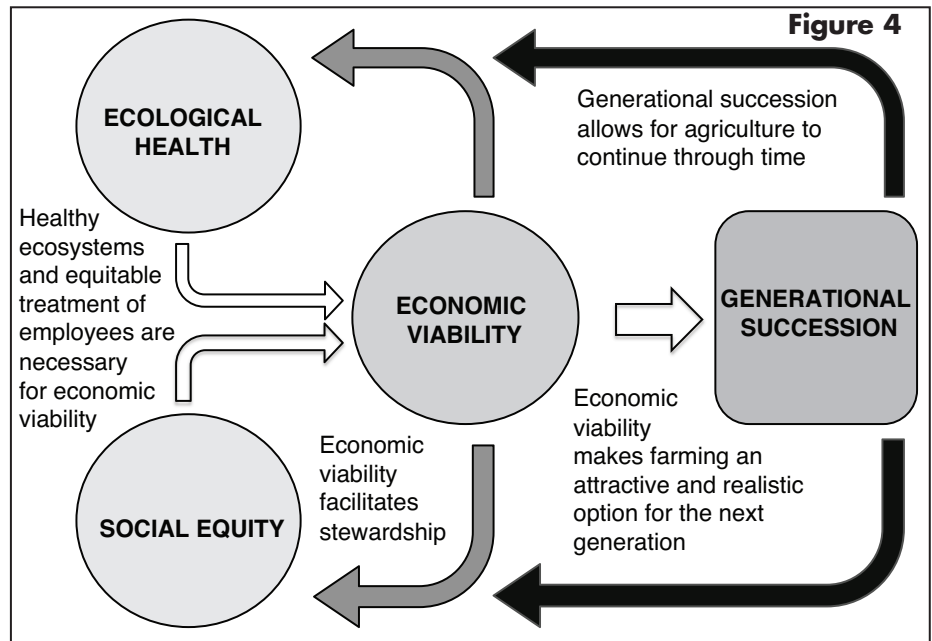
In one grower's words, "I won't force my children to follow in my footsteps, but I want my kids to have the choice. I had that choice. I want to give my kids the same option."

**Conclusions**

Definitions of sustainable agriculture are more useful if they are oriented toward action. We have explored the meaning of sustainability from the practitioner's perspective with the hopes of grounding the sustainability discussion in real needs and realities. We shed some light on how viticulture practitioners would answer the questions about what is to be sustained, for how long, for whose benefit, at whose cost, in what geographic space, by which means, and how progress will be measured. For this reason, this report reflects the views of California growers and outreach professionals. Other perspectives including those of environmental and human rights interest groups, to name two categories, must also be considered.

We end with three of many recommendations that could come from our analysis of practitioner definitions. We encourage *PWV* readers to draw additional conclusions.

First, theme networks of sustainable agriculture are potential tools for out-



reach and education programs, and for practitioners themselves, to better understand and evaluate underlying assumptions that implicitly guide decision making around sustainability in winegrape growing. They can be used to identify knowledge gaps in practitioner understanding of sustainability that may differ from scientific understanding, thus pointing to a need for dialogue and sharing knowledge among scientists and practitioners.

Second, groups in conflict can use practitioner definitions as communication and cooperation platforms. According to T. Tomich *et al.*, "Developing a shared conceptual framework may generate dialogue among groups with different assumptions, ways of understanding, and approaches to managing dynamic natural and social systems."<sup>7</sup>

Sustainability means different things to different people, and conflict often arises when stakeholders cannot agree on an agenda. However, this does not diminish the need for effective communication and cooperation, despite tensions. Definitions can guide effective problem solving only if they span divides between groups arguing over contentious issues.

To do so, definitions must possess three characteristics: SALIENCY to practitioners ("Is it relevant?"), CREDIBILITY with regard to scientific

and practical understanding of agriculture ("Is it sound and convincing?"), and LEGITIMACY in the eyes of stakeholders ("Is it inclusive and unbiased?").<sup>8</sup> The central and core themes are likely to be the most salient, credible, and legitimate to viticulture practitioners.

Central themes have higher potential as starting points that may lead to broad discussion of important sustainability topics (Figure 2). Dialogue about vine balance may only spur discussion about reduced inputs and irrigation.

In contrast, dialogue around resource stewardship may lead to a much broader discussion about continuation into the future, improving ecosystem function<sup>9</sup>, natural habitat, civic contribution, yield, water quality and conservation, reduced enological impact, and winegrape quality.

Core themes have the greatest potential relevance to practitioners across political or other differences. Continuing into the future with a focus on generational succession, resource stewardship, and systems thinking may be the strongest platforms for cooperation. These applications, and any others taken from the results presented here, are useful for viticulture outreach and education programs that assist practitioners who are address-



ing changes in sustainability.

Finally, the practitioner's focus on continuation into the future and generational succession brings attention to the importance of who will be farming in the future. What can we do to counter the national trend of a decreasing number of farmers and increasing farmer age?

Succession planning is critical for ushering in the next generation of farmers. However, research suggests that the California wine industry is ill-prepared for succession.<sup>9</sup> A majority of California wineries foresee ownership transitions in the coming decade, but a majority of those wishing to maintain family ownership are unprepared to transition the business to the upcoming generation.

In this report, we have discussed intra-familial succession, but equally important is supporting the entry of first generation farmers. Sustainability programs, like those

mentioned above, can help meet the succession needs of winegrape growing families, and those wishing to enter viticulture, by including succession and entry services in their outreach agendas, and by explicitly adding succession planning and apprentice or intern programs to sustainability workbooks and certification criteria. ■

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