

# Perceived Efficacy of Sustainability Strategies in the U.S., Italian, and Spanish Wine Industries: A Comparative Study

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## **Abstract:**

**Purpose** — This investigation compares the perceptions of competitive advantage (cost leadership and differentiation) with the practices of U.S., Italian, and Spanish wineries.

**Design/methodology/approach** – Data are collected via self-report web-based surveys in California, Tuscany, and Catalonia during the most severe economic downturn in the industry, from 2010-2013.

**Findings** – Of the 260 respondents among the three country samples, over 75% are family-owned, family-managed. Respondents indicate who has implemented a clear business case for an Environmental Management System (EMS) and who has not. Benefits and challenges of implementing sustainability practices are also addressed.

**Originality/value** – Activities that create competitive advantages for wine businesses are understudied; this research bridges that gap.

**Practical implications** - A comparable percentage of respondents across the three countries indicated a 'clear business case for EMS.' Wineries in all three countries perceive that they have competitive advantage through implementation of EMS and commitment to sustainable practices. Top perceived benefits for respondents from the U.S. and Italy are focused on cost reduction strategies, while top perceived benefits for Spanish respondents are focused on differentiation strategies.

**Key words:** Competitive advantage, Cost leadership, Differentiation, Environmental Management System (EMS), Multi-country analysis.

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We have a constant battle to get the recognition we deserve with all the work we've done on sustainability. The industry is very green — and yet that's something that's not widely known.

— Barbara Banke, owner, Jackson Family Wines, Sonoma, California, USA, quoted by Penn, C. (2011).

Today, being 'natural' has become a cliché in the wine industry: I am only trying to attract consumers because they are interested in the quality of my products. First of all mine should be considered as a good wine and, second, it should be considered as a biodynamic wine...I would not say that 'going green' is my strategy, unless you would define strategy as anything else than a coherent behaviour.

— Stella di Campalto, owner, Stella di Campalto, Montalcino, Italy, quoted by Santini, C. *et al.*, (2011).

In my vineyard, it is easy to see chickens and geese walking the vineyards that in addition to their contribution to soil organic matter, are natural predators of many insects ... a real respect for the environment.

— Miguel Torres, Chairman and CEO of Bodegas Torres, a fourth generation family business.

## 1. IMPORTANCE OF THIS INVESTIGATION

The global wine industry, which is comprised primarily of small-medium enterprises (SME), has survived numerous environmental jolts in during its long evolution in the Old World (Europe) and relatively shorter existence in the New World (Australia, New Zealand, South Africa, South America, and the United States). Wine businesses today confront survival threats from the natural world such as rising energy prices, water scarcity, mounting concerns about chemical exposure, and climate change (Guthey and Whiteman, 2009; Hertsgaard, 2010). Mitigating these threats involves many different actors and institutions in the winery owner or manager's decision to formalize a business case for sustainability. Stakeholder pressures can drive adoption of sustainable practices, which, in turn, can result in product innovation, pollution prevention, and stewardship of natural resources (Berns *et al.*, 2009; Carrillo-Hemosilla *et al.*, 2010).

As the scope and intractability of an environmental problem rise, so do opportunities for innovation of sustainable processes and products in the pursuit of a sustainable competitive advantage (Porter and Van Der Linde, 1995). Such process and product innovations may be positively related to business performance (Nguyen and Slater, 2010; York and Venkataraman, 2010). Prior researchers have found that business age, size, and ownership (public v. private) are related to investments in sustainable systems (Elsayed, 2006; Melnyk *et al.*, 2003; York and Venkataraman, 2010). Because of the huge sunk cost associated with these investments, incumbent businesses may resist adoption due to fears of cannibalizing existing product lines and instead elect to pursue only those activities considered absolutely necessary for regulatory compliance (Gabzydlova *et al.*, 2009; Hughey *et al.*, 2005; Manktelow *et al.*, 2002). Younger, entrepreneurial agricultural businesses, conversely, show a propensity to invest in innovations that supplant existing structures, some creating new standards for sustainable processes and products (Carrillo-Hermosilla *et al.*, 2010; Gilinsky *et al.*, 2008).

## 1.1. Wine Industry Overview

Wine is a global business, yet wine as a product continues to be defined by their origin (Orth *et al.*, 2007). An estimated 64% of the export market share is concentrated in the hands of ‘Old World’ countries e.g. Italy, France, Spain, Portugal and Germany, while amongst the ‘New World’ producers, United States wine businesses own an estimated 5 percent share of the world market (USDA, 2007). Growth in global demand is mainly being driven by a shift in consumers’ preferences and lifestyles in some established consumer markets, such as the United States and United Kingdom, or by new consumers in emerging markets, such as Brazil, China, India, or Russia. Consumption in traditional ‘Old World’ wine producing nations, such as Italy or France, has been decreasing in the first decade of the 21<sup>st</sup> century.

After a period of unprecedented and sustained growth from 2002-2007, wine producers around the world sought an edge to differentiate their brands and also to reduce costs during as well as in the immediate aftermath of an unprecedented 2008–2009 industry downturn. Many wineries faced financial difficulties due to market saturation. Almost all wine producers experienced downward pressure on prices and margins. Some industry observers opined that wine producers faced a newly ‘hyper-competitive’ trading environment. The rate of new brand introductions slowed in 2009 and 2010, in a period when wine wholesalers and distributors were struggling to sell off a backlog of wine inventory and thus less receptive to taking on new wines to sell (Penn, 2011). The premium wine-producing regions of California in the United States, Tuscany in Italy, and Catalonia in Spain, respectively, were not immune to these trends.

### 1.1.1. United States

Among all 50 producing states in America plus the District of Columbia, California maintains a leading role in the United States wine industry: 43 percent of all U.S. wineries are settled in California, holding an estimated 63 percent of the United States wine market share by value of cased goods sold (Wine Institute, 2011). Some favourable market conditions, together with the latest efforts in setting bilateral and multilateral trade negotiation for reducing export barriers, appear to be creating opportunities for a further globalization of the California wine industry. To many players in the United States wine industry, investments in sustainability could be seen as ways to reduce costs and meet the ‘triple bottom line’.<sup>1</sup> As of early 2011, some 1,237 California vineyard and 329 winery owners voluntarily participated in the Sustainable Winegrowing Program (SWP), despite widespread perceptions that sustainable farming practices increased the cost of production and lowered crop yields. According to the Napa Valley Vintners Association Napa Valley boasted 404 premium wineries in 2011, of which 60 were classified as ‘Green’ or ‘Sustainable’ in some fashion.

### 1.1.2. Italy

Italy, as the top world producer of wine by volume, possesses the greatest number of wineries and has among the highest per capita wine consumption rates in the world (FAO, 2005; ISTAT 2012). Tuscany produces 10 percent of all Italian premium wines and represents the leading

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<sup>1</sup> The ‘triple bottom line’ called upon producers to measure the impacts of their activities upon ‘people, planet, and profit,’ that is, creating social, environmental, and economic value. That the wine industry was greening was borne out by a report issued by the California Sustainable Winegrowing Alliance in 2009 (Brodt and Thrupp, 2009).

region for premium wine production in Italy amongst the 72 DOCG in that country (ISTAT, 2004). As a preponderance of Italian wineries are family-owned and operated businesses (Gallucci and D'Amato, 2013), in order to be successful over the long-term, they perceive sustainability strategies as necessary in order to increase their resilience to significant competitive forces in the marketplace (Flint *et al.* 2011). Italian firms are also showing a growing interest for sustainability in general, believing a sustainable orientation could represent a strategic asset for facing the market challenges emerging from the economic crisis that is affecting the country (GreenItaly, 2012). As of 2012, 8 percent of Italian grape acreage is organic, which equates to 57.000 hectares (Nomisma, 2014). With the increasing organic wine demand by Italians and the recent evolution of the European Regulation for organic wine and grape production, the Italian green wine market has attracted many producers that are offering wines under various bio-sounding labels, e.g., free wine, pure wine, natural wine (Federbio, 2014; Nomisma, 2014).

### 1.1.3. Spain

According to data published by its Ministerio de Agricultura, Alimentación y Medio Ambiente, Spain is the country with the largest area of vineyards in the world. In 2011, its 1,002,210 hectares of vineyards represent one-third of the total area of the European Union dedicated to vineyards (MAGRAMA, 2012a, b). Moreover, wine grapes are the third most widely cultivated crop in Spain, behind cereals and olives (López-Guzmán *et al.* 2011). Spain also claims to be the leading country engaged in organic viticulture, owing to its 57,000 hectares of land in production of organic grapes, which in turn represents 5 percent of the total grape production nationally. Spanish organic grape producers added 3,000 hectares alone in 2010 (Stolz and Moschitz, 2013). From 2007-2012, eco-farmed grapes have grown by 230 percent in volume with the region of Castilla-La Mancha leading the way (Cuilhé and Martínez, 2013). A “green revolution in winemaking” began in the 1970s, when Josep M<sup>a</sup> Albet Noya converted the region of Penedès (Barcelona) to sustainable farming. Alvaro Palacios, Telmo Rodriguez, and Peter Sisseck, Bodegas Torres, and other distinguished wine producers later helped to promote the evolution of biodynamic farming in Spain (Martinez, 2013).

## 1.2. RESEARCH QUESTIONS AND ORGANIZATION OF THIS PAPER

Prior studies of wine businesses and sustainability have been primarily descriptive and have focused on the internal, external, and strategic factors leading to implementation of environmental management systems (EMS) (Dodds *et al.*, 2013; Fearn, 2009; Gabzdylova *et al.*, 2009; Hughey *et al.*, 2005; Marshall *et al.*, 2005; Marshall *et al.*, 2010; Raffensberger and Catska, 2009). Other studies have examined eco-labeling or eco-branding product differentiation strategies to ascertain if those attributes enable a wine brand to stand out in a crowded fight for “mouth share” (Brugarolas *et al.*, 2005; Forbes *et al.*, 2009; Fotopoulos *et al.*, 2003; Remaud *et al.*, 2008). Other research into wine businesses and sustainability has focused on the factors leading to adoption of EMS (Atkin, *et al.*, 2012; Fearn, 2009; Gabzdylova *et al.*, 2009; Hughey *et al.*, 2005; Marshall *et al.*, 2010). Research with country comparisons can be found, but mainly focus on country of origin with respect to consumer perceptions, evaluation of wines, or brand image (Chaney, 2002; Guidry, *et al.*, 2009).

There have been relatively few comparative global studies on sustainability strategy in the wine industry (Gilinsky *et al.*, 2008; Grimstad, 2011; Marshall *et al.*, 2010). Research has yet to uncover whether or not firms’ pronouncements on sustainability match their actions, and if so, to what extent country location impacts these strategic decisions (Bernabeu *et al.*, 2008; Melnyk *et al.*, 2003). This research answers the call for a cross-cultural study focusing on similar businesses across three countries (Orth *et al.*, 2007). We seek to answer three basic questions:

1. Are there country similarities or disparities in implementing sustainability in practice?
2. Is there congruence between attitudes towards sustainability and actual implementation of EMS?
3. Are there country similarities or disparities in perceived benefits of sustainability strategies?

The next section summarizes prior research into the connections between attitudes towards sustainability and implementation of EMS. The third section describes the research design and presents descriptive statistics from our samples from Italy, Spain, and the United States. The fourth section presents preliminary findings via tables containing descriptive statistics from the investigation. We close by presenting a preliminary discussion of results and propositions to be tested in a future study.

## 2. RELEVANT RESEARCH ORIENTATIONS

A sustainable strategic position, according to Porter (1980), requires managers to choose between trade-offs. The conventional wisdom circa 1990 held that investments in improved environmental performance would reduce profits due to increased costs, reduced quality or increased lead-time. Porter started a shift in producers’ attitudes towards environmental responsibility maintaining that pollution was simply waste that diminished value and indicated problems in production processes and products (Porter, 1991), thus eliminating pollution waste would actually improve competitiveness.

There is a movement of wine businesses toward sustainable farming and business practices, whether organic, biodynamic, or a combination; and these environmental strategies can work toward a differentiation of their brand at retail (Steinthal and Hinman, 2007) or serve to optimizing the economic return on investments with cost reductions. Researchers have sought to empirically prove theories advanced by Porter (1980, 1985) and Barney (1997) to determine if there are linkages between perceptions of the need for sustainability strategies and a clear business case for implementation of those strategies. See Table 1 for an abridged summary of prior research applicable to this study and the perceived benefits of a sustainability strategy.

**Table 1. Abridged summary of prior research into perceived benefits of a sustainability strategy.**

PERCEIVED BENEFITS OF A SUSTAINABILITY STRATEGY	AUTHOR(S)
<u>Cost reductions</u> <ol style="list-style-type: none"> <li>1. Relative price: eco-efficient materials, re-use by-products, high process yields</li> <li>2. Relative share: radical process innovations to disrupt mature markets</li> <li>3. Barriers to entry: lowest price and lowest impact on environment</li> </ol>	Porter (1991) Barney (1997) Sroufe (2000) Orsato (2006)
<u>Manifestations of competitive advantage</u> Scale economies, learning curve, differential low-cost access, waste minimization,	

technological innovation, structure, employee retention and compensation	
<p><u>Differentiation</u></p> <ol style="list-style-type: none"> <li>1. Consumer perception: clear benefit or environmental value</li> <li>2. Product/service uniqueness: difficulty of replication or imitation by rivals</li> <li>3. Consumer confidence: reputation, loyalty/retention, life cycle value</li> </ol> <p><u>Manifestations of competitive advantage</u></p> Product features such as organic or biodynamic, clear linkages between environmental management and business functions, early entry timing, location, product mix, inter-firm linkages, improved service, image	Wood (1991) Porter & Van der Linde (1995) Barney (1997) Waddock <i>et al.</i> (2002) Reinhardt (1998) Orsato (2006)

Source: prepared by authors for use in this investigation.

In strategic management, according to the resource based view (RBV) theory, sustainability practices can serve as part of a firm’s capabilities that contribute to performance (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984). The RBV starts with the assumption that the desired outcome of managerial effort is the establishment of a sustainable competitive advantage. The basic elements of an effective EMS are described in ISO 14001 standards, and as such, ISO 14001 certification can be thought of as an intangible resource that improves the quality of management in order to provide operational efficiencies (Delmas, 2001).

Prior research into EMS tools, such as ISO 14001, have found that they have the ability to provide economic benefits to certified firms in terms of competitive advantage as well as improving environmental performance (Bansal, 1999; Corbett and Kirsch, 2000). Direct financial benefits might include a reduction in regulatory fines and increased operational efficiencies. Certification can also indicate that the company has a sound environmental system in place to placate external stakeholders such as customers, investors, and regulatory agencies.

An expanded version of RBV theory is the natural resource based view, one that includes a firm’s environmental practices (Hart, 1995). Prior studies based on the natural resource based view construct involved large United States manufacturing firms. These studies link enhanced environmental practices with improved economic, operational, and environmental performance (Melnik et al., 2003; Rao and Holt, 2005; Sroufe, 2003).

**2.1. Perceptions of Sustainability**

Grimstead (2010) posited that the global wine glut leads to a focus on cost reduction and initiatives to achieve competitive advantage of environmentally certified wines. There is evidence that capabilities for process innovation and implementation, central to deployment of EMS, are complementary assets that moderate the relationship between best practices and cost advantage, a significant factor in determining firm performance (Christmann, 2000).

Prior to the advent of new technologies (i.e., recycling, energy efficiency and self-sufficiency, Internet), it was difficult for SMEs to pursue cost advantages. Within the past 15 years smaller companies such as Cirque du Soleil, Trader Joe’s, and [ yellowtail ]® wine, have introduced high quality differentiated products for lower prices through innovative use of new technologies, whilst sustaining a cost advantage over rivals (Chan and Maubourgne, 2005).

## 2.2. Perceived Advantages of Implementing Sustainability

Implementing a sustainability strategy also can enable a company to create a unique or differentiated product, one which customers perceive as innovative or of higher quality in some way that is important to them, and which in turn allows the company to charge a premium price for its product or service (Hill and Jones, 2010). Previous results, mostly relating to large firms, suggest that some larger firms have difficulty in obtaining competitive advantages through environmental proactivity (Russo and Fouts, 1997; Sharma and Vredenburg, 1998).

For the smaller, more agile firm, however, doing so can generate a set of capabilities that facilitate certain innovations in product development (Gilinsky et al., 2010). Proactive environmental management can provide wineries with a competitive advantage via differentiation of their products (if the company's products are produced without lasting harm or environmentally-friendly) and by increasing the firm's reputation as a good corporate citizen. A consumer's trust in the winery and brand equity for the winery may increase when wineries adopt proactive environmental policies (Nowak and Washburn, 2002). Consumers may consider as unique or innovative those products that are sustainably produced and environmentally munificent (Porter and Van der Linde, 1995).

## 2.3. Location Impacts

Distinguishing their product based on the geographic origin of the grapes provides wineries opportunities for product and quality differentiation and resulting additional revenue (Thode and Maskulka, 1998). Researchers investigating wine producers from Spain facing survival and global competition found they should employ differentiation strategies through marketing the country origin or its organic nature (Bernabeu *et al.*, 2008).

## 3. HYPOTHESES

Continued progress toward sustainability at the individual business level depends largely on increasing the awareness of owners and managers about benefits to the environment (i.e., values). Managers that have strong environmental values can then infuse these values throughout the company (Marshall *et al.*, 2005). This leads to our first hypothesis.

**H1:** Location has no impact on adopting a business case for sustainability.

The costs of improving environmental performance can be offset by increased revenues (Klassen and McLaughlin, 1996). External certifications and product labeling can offer a potentially new basis of differentiation to attract environmentally oriented wine consumers. Costs stemming from materials waste and inefficient processes can be mitigated by firms that invest heavily in EMS. Several benefits have been associated with EMS implementation: innovations in terms of resource efficiency and pollution prevention as well as new quality control opportunities (Stegner, 2000). This leads to our second and third hypothesis.

**H2:** Location has no impact on justifying a business case for sustainability, as wineries that implement an EMS are more likely to have a perceived *cost advantage*.

**H3:** Location has no impact on justifying a business case for sustainability, as wineries that implement an EMS are more likely to have a perceived *differentiation advantage*, e.g. in terms of innovation or quality.

## 4. METHODS

To collect information on winery sustainability practices, e.g., sustainability defined, potential impacts, strategies, possible challenges and benefits, and the value in environmental practices, a survey instrument was designed based on an adaptation of a sustainable practices questionnaire for CEOs of Fortune 500 global businesses that had earlier been developed and tested by Berns *et al.* (2009). As the survey instrument was to be administered on-line via SurveyMonkey, 16 winery owners who attended the November 2010 Green Wine Summit in Santa Rosa, California, agreed to pre-test the survey in its web-based format upon receiving guarantees of anonymity. Minor adjustments were subsequently made to some questions to increase clarity and understanding and to somewhat reduce questionnaire length. Pre-test results were excluded from the final sample. The questionnaire was translated by the research team members in Italy and Spain. The survey opened in all countries in late November 2010, closing in late April 2011. Respondents were guaranteed anonymity; completed surveys were kept disguised by a number.

### 4.1. Survey Administration

For survey administration, we chose a single geographically defined sector in the United States (Northern California) and Italy (Tuscany) and Spain (Catalonia) to remove any possible distortion arising from peculiarities of different sectors or the biases that various regulations or national aid and subsidy policies, which governments and other agencies might introduce in other wine-growing regions across the globe. The researchers from each country separately compiled the results for later comparisons. We did not find any significant differences between the descriptive characteristics of the firms included in the study (location, activities and size when available) and the original population.

The U.S. research team emailed an invitation to participate in the survey to a convenience sample of 1,469 U.S. wineries, which was compiled from attendees at the annual Unified Wine and Grape Symposium in Sacramento, California. A second team of researchers in Italy simultaneously emailed an invitation to complete a translated version of the same survey to 758 wineries from a database of Tuscany (Italian) wineries, and the Spanish team sent a translated version to 760 wineries from a database of Catalonian (Spanish) wineries. Follow-up emails were sent two weeks and two months and one year later. We adhered to Dillman's (1991; 2000) mail and web survey methodologies, but the historically private nature of the wine industry as well as a lengthy question list (23 closed-end and ranking questions, using a Likert scale of 1–5) appears to have posed an obstacle to gathering a greater number of completed surveys in each country.

### 4.2. Response Rates

The United States and Italian research teams received 102 and 106 usable, completed surveys, respectively, while the Spanish team eventually received 52 completed surveys, for a total of 260 usable surveys. This translated into a response rate of approximately 7 percent for the United States sample, about 14 percent for the Italian sample, and about 7 percent for the Spanish sample, a range that is not atypical of mail surveys (Pullman *et al.*, 2010). Although this response rate was attenuated in comparison with more wide-ranging empirical studies, a number of recent published investigations into adoption of environmental management systems by firms in the food and wine sectors report similarly low response rates (Olsen and Thach, 2007; Martín-Tapia *et al.*, 2008; Pullman *et al.*, 2009). Non-response data were not collected for those respondents

who started to complete the questionnaire, but closed their browser; and no evident biases were observed from examination of the incomplete responses.

**4.3. Sample Profiles**

Demographics of the sample wineries in all countries were comparable. Over 75 percent of respondents’ wineries were family-owned and family-managed. Although the question was asked, the Italian wineries declined to state annual case production, so comparisons among the three country samples based on firm size could not be made.

Company owners comprised roughly two-thirds of the respondents in each sample, most likely because these were small-to-medium firms. About four in ten wineries in each sample had been in business from 11 to 49 years (see Table 2). Unsurprisingly, the number of U.S. firms, aged 50+ years, was one-half that of Italian firms and one-third that of Spanish firms.

**Table 2. Age of respondent firms**

Age of winery, years:	USA			ITALY			SPAIN		
	n	Percent	Cum percent	n	Percent	Cum percent	n	Percent	Cum percent
100+ years	3	2.9%	2.9%	5	4.9%	4.9%	4	7.7%	7.7%
50 - 99 years	7	6.9	9.8%	18	17.5	22.3%	12	23.1	30.8%
11 - 49 years	46	45.1	54.9%	41	39.8	62.1%	23	44.2	75.0%
5 - 10 years	31	30.4	85.3%	28	27.2	89.3%	11	21.2	96.2%
< 5 years	15	14.7	100.0%	11	10.7	100.0%	2	3.8	100.0%
<b>TOTAL</b>	<b>102</b>			<b>103</b>			<b>52</b>		
<i>Declined to state</i>	0			3			0		

**5. FINDINGS**

Prior studies have shown that environmental values and personal satisfaction drive sustainability investment decisions (Gabzdylova *et al.*, 2009; Silverman *et al.*, 2005). Internal issues, such as the desire to be good stewards of the land or preserving the winery for future generations appear to be highly correlated with the successful implementation of environmental policies (see Table 3), although caution is advised in interpreting these results, inasmuch as the age of the winery may negatively correlate with managerial willingness to implement sustainable practices, often due to entrenched attitudes and cultural or familial resistance to change.

**Table 3. Adopting sustainable practices.**

	USA		ITALY		SPAIN	
	n	Percent	n	Percent	n	Percent
Willing to implement (1 = strongly disagree, 5 = strongly agree)						
No interest in adopting sustainable practices	4	4.0%	6	7.4%	5	9.6%
Never adopted sustainable practices, but might be interested	8	8.0%	21	25.9%	7	13.5%
Planning to adopt sustainable practices, but not ready yet	13	13.0%	18	22.2%	9	17.3%
Recently adopted sustainable practices	27	27.0%	19	23.5%	12	23.1%
Sustainable from the start	48	48.0%	30	37.0%	19	36.5%
<b>Number of Respondents</b>	<b>100</b>	<b>100.0%</b>	<b>94</b>	<b>100.0%</b>	<b>52</b>	<b>100.0%</b>
<i>Did not respond</i>	2		12		0	

A comparable percentage of respondents across the three countries indicated a ‘clear business case for EMS,’ thus support for Hypothesis 1. Very few respondents (fewer than six percent) across all three countries indicated their wineries had tried to implement sustainable practices and abandoned the effort (see Table 4).

**Table 4. The business case for sustainable practices.**

Perceptions of Sustainability strategies

Business case/value proposition for sustainable practices	USA		ITALY		SPAIN	
	n	Percent	n	Percent	n	Percent
Yes	18	21.2%	17	25.4%	6	19.4%
No	48	56.5%	45	67.2%	12	38.7%
Unsure	14	16.5%	2	3.0%	2	6.5%
Have tried but too difficult to develop and continue	5	5.9%	3	4.5%	1	3.2%
<b>Number of Respondents</b>	<b>85</b>	<b>100.0%</b>	<b>67</b>	<b>100.0%</b>	<b>31</b>	<b>100.0%</b>
<i>Did not respond</i>	17		39		21	

We highlighted the top three desired EMS implementation tools for each country shown in Table 5. Of note is that “new techniques and methodologies” was a top three choice across all three countries. The respondents’ knowledge of or comfort level of six-sigma/LEAN manufacturing and understanding of LEED standards was such that these tools did not make the top three of any country.

**Table 5. Desired tools to implement sustainability practices.**

Desired EMS implementation tools (rated top 3)	USA		ITALY		SPAIN	
	n	Percent	n	Percent	n	Percent
New strategic frameworks and approaches	20	31.3%	<b>18</b>	<b>48.6%</b>	<b>10</b>	<b>20.0%</b>
High-level sustainability diagnostic tools	<b>23</b>	<b>35.9%</b>	5	13.5%	<b>7</b>	<b>14.0%</b>
Six-sigma / LEAN manufacturing	5	7.8%	0	0.0%	2	4.0%
Understanding of organic / biodynamic certification standards	15	23.4%	12	32.4%	<b>7</b>	<b>14.0%</b>
Understanding of LEED standards	11	17.2%	5	13.5%	6	12.0%
Financial tools to evaluate sustainability investments	<b>28</b>	<b>43.8%</b>	8	21.6%	4	8.0%
Expertise in a specific domain (clean tech, pollution prevention, government policy)	20	31.3%	<b>13</b>	<b>35.1%</b>	3	6.0%
External consulting services	6	9.4%	11	29.7%	1	2.0%
New techniques and methodologies	<b>25</b>	<b>39.1%</b>	<b>18</b>	<b>48.6%</b>	<b>8</b>	<b>16.0%</b>
Tools not important	2	3.1%	2	5.4%	1	2.0%
Don't know/ other	11	17.2%	8	21.6%	1	2.0%
<b>Number of Respondents</b>	<b>64</b>	<b>100.0%</b>	<b>37</b>	<b>100.0%</b>	<b>50</b>	<b>100.0%</b>
<i>Did not respond</i>	38		69		2	

We highlighted the top three perceived benefits of sustainability strategies for each country shown in Table 6. Interestingly the top three for Spanish respondents were different from the top three for U.S. and Italian respondents, where there were similarities. Using the top three as indicators for Hypothesis 2 and 3 across all three countries, there would be non-support. Of interesting significance, the top perceived benefits for respondents from the U.S. and Italy are focused on cost reduction strategies, e.g., improving efficiencies and reducing or eliminating waste, while the Spanish respondents saw perceived benefits through differentiation by highlighting their sustainable efforts in product branding and improving their supplier and distributor relationships. Further analysis of respondent data may garner different results as each benefit is evaluated; results will be presented at the conference.

**Table 6. Perceived benefits of sustainability strategies.**

	USA		ITALY		SPAIN	
	Mean	n	Mean	n	Mean	n
<i>Building awareness of sustainability in the organization</i>	3.73	85	2.89	61	2.39	47
<i>Highlighting sustainability in company or product branding</i>	3.65	86	3.24	62	<b>3.01</b>	<b>45</b>
<i>Highlighting sustainability in the recruitment of employees</i>	2.80	85	2.39	62	2.26	48
<i>Highlighting or promoting sustainability in supplier and distributor relationships</i>	3.43	86	3.31	64	<b>3.05</b>	<b>46</b>
<i>Including sustainability in scenario planning or budget forecasts</i>	3.40	86	3.38	61	2.15	47
<i>Influencing government policies/regulations (e.g. product</i>	3.08	84	3.06	63	2.46	47

<i>content, packaging, etc.)</i>						
<i>Reacting to government policies/regulations (e.g. product content, packaging, etc.)</i>	3.25	85	3.17	60	<b>3.21</b>	<b>48</b>
<i>Reducing or eliminating carbon or greenhouse gas emissions</i>	3.48	84	3.57	61	2.35	46
<i>Reducing or eliminating toxicity of harmful chemicals</i>	4.11	84	<b>4.02</b>	<b>61</b>	2.56	46
<i>Reducing or eliminating waste by-products</i>	<b>4.16</b>	<b>85</b>	<b>3.90</b>	<b>60</b>	2.78	46
<i>Improving efficiency in packaging and closures</i>	3.80	84	3.38	63	2.69	46
<i>Improving efficiency in energy consumption</i>	<b>4.26</b>	<b>84</b>	<b>3.77</b>	<b>62</b>	2.21	47
<i>Improving efficiency by reducing waste by-products</i>	<b>4.13</b>	<b>84</b>	<b>3.77</b>	<b>61</b>	2.00	46
<i>Developing new sustainability-related business opportunities (e.g., clean energy solutions)</i>	3.49	83	3.48	61	2.78	46
<i>Designing processes or products for reuse and recycling</i>	3.87	84	3.64	61	2.41	45
<i>Other</i>	3.43	7	3.5	4		0
<b>Number of Respondents</b>		<b>86</b>		<b>67</b>		<b>49</b>
<i>Did not respond</i>		16		39		3

## . 6 DISCUSSION AND FUTURE RESEARCH DIRECTIONS

Research relating to sustainability strategies adopted by the wine industry has shown mixed results in prior cross-country studies. Researchers in California and New Zealand found that external pressures had no impact on differences in the level of success wineries and vineyards achieve in implementing environmental practices (Silverman *et al.*, 2005). Researchers in Australia and France found significant differences between the two countries. Australian wineries rated themselves higher in growth strategy and perceived innovation environment than French wineries (Jordan *et al.*, 2007). More highly successful wineries in California and New Zealand perceive internal pressures to be greater than less successful wineries (Marshall *et al.*, 2010). Development of an EMS *may* be more likely to generate proactive, beyond-compliance initiatives on the part of New Zealand wineries, as opposed to reactive responses to new regulations or stronger enforcement of existing regulations (Dodds *et al.*, 2013).

One mechanism to increase such awareness among winery owners across the globe could be sharing of best practices of EMS, i.e. those that have a likely impact on decreasing production costs and/or increasing wine quality. Future investigations are needed to ascertain any longitudinal impacts of sharing best practices on sustainability and cost reduction and/or quality improvement. Future investigations of market sensitivity to environmental or sustainability issues and producers' attitudes and practices in other wine-growing regions in the United States, Italy, and Spain, as well as in countries, could prove fruitful.

Caution should be used in interpreting and generalizing these results. Limitations include the small number of respondents in comparison to the universe of wineries in these three countries; the inability to obtain external verification due to the anonymity of the respondents; and the reliance upon self-reported attitudes and practices. As performance measures developed for this study were adapted from Berns *et al.* (2009), other measures, including longitudinal variables — such as, payback periods and Returns on Investment in EMS (ROI) — could be employed. Timing of this investigation may have distorted perceptions of the importance of investment in EMS, as the wine industry had just weathered and was emerging from a global recession. Although the costs of implementing sustainability strategies may well be immediate and measurable for a winery, the benefits may be long term and thus difficult to assess using a cross-sectional methodology (Stegner, 2000).

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