

**Wine on the Web -
Rapid Appraisal of Web Sites by Wineries and Wine Merchants
from Australia, California, and Germany**

S. Stricker*
R.A.E. Mueller*
D.A. Sumner**

* *Department of Agricultural Economics, University at Kiel, German
(email: sstricker@agric-econ.uni-kiel.de ; raem@agric-econ.uni-kiel.de)*

** *Department of Agricultural and Resource Economics, University of California, Davis, CA.
(email: dasumner@ucdavis.edu)*

1 Introduction

Wine is a marker crop of globalization. When the Romans "globalized" the ancient World they spread their language, laws, their virtues and their vices all across the Mediterranean and western Europe. Drinking wine was one of the Roman vices and, fortunately for Germany, the Romans brought viticulture to where they settled and built bases. When the British colonized some parts of Asia and all of Australia they "globalized" many crops when they brought tea to India, coffee to Africa and wine to Australia. In California wine marked the arrival of a new era after the inclusion of the state into the United States in 1850. Here Agoston Haraszthy planted the first large vineyard with grape vines imported from Europe in Sonoma Valley in 1856.

We are now experiencing another wave of globalization whose core technology is the Internet. Again, wine is riding the tide and the wine industries of the wired countries are among the first of the agricultural industries that are beginning to be transformed by the Internet. Early signs of the transformation abound. For example, wine makers in Germany who may not have changed the style of their labels for decades, suddenly add email addresses to their catalogs and promotional brochures. Also, some have built web sites where they tell the story of their vineyards, cellars, and wines, and where they proudly show pictures of their property and family.

Our hedonistic affection for wine apart, several thoughts kindled our interest in e-commerce in the wine industries of three major wine growing regions - Australia, California and Germany:

- (1) Wine is a highly differentiated, internationally traded experience-product and competition on major export markets is intense;
- (2) some developments in the wine industry may be indicative of what is likely to happen in other agricultural industries that are still at a lower level of the e-commerce diffusion curve;
- (3) there is sufficient variation in the regulatory, economic and technological environment of the wine industries in Australia, California, and Germany to suggest, and perhaps allow us to test, hypotheses about the determinants of e-commerce diffusion and impact on agricultural industries.

Our research on e-commerce in the wine industry is still at an early stage. At the outset of a larger study it is appropriate to engage in fact finding and in this paper we report results from rapid web

appraisal of commercial wine sites. The purpose of the appraisal was to provide answers to three questions:

- (1) What are the key characteristics with import for e-commerce of the wine industries in the three regions?
- (2) Are there differences in their e-commerce readiness?
- (3) For what purposes is the web used and what, if any, are the differences in web use by the wine industries from the three regions?

In addition to reporting our empirical results we speculate about:

- causes of the differences found; in particular, we discuss hypotheses that explain the differences in terms of differences in countries' industry structure and e-commerce readiness;
- implications of the current differences in e-commerce engagement for future competitiveness of the three wine industries on international export markets.

2 The wine industries of Australia, California and Germany

2.1 Area, production, and exports

The three wine regions considered here together account for 6.5 percent of World vineyard area and 13.4 percent of World wine production. California is the largest of the three wine regions. In 1999 the state produced about 24 mio hl of wine from about 315,000 ha of vineyards. Vineyard area in Germany is only about one third of California's area but Germany produces from this area about 12.3 mio hl of wine. Australia is the smallest wine producer of the three. Her vineyards cover about 90,000 ha and produced about 7.4 mio hl wine in 1999.

Table1: Wine production, domestic consumption, and exports.

	1998 Wine production [mio hl]	1998 Wine exports [mio hl]	% of production exported	1997 consumption [mio hl]	1997 per capita consumption
Australia	7.4	3.2	42.5	19.8	19.0
Germany	10.8	2.2	20.6	18.6	22.8
California/US	20.5	2.5	12.3	3.5	7.4

Source: Wine Institute and FAO

There are marked differences in wine consumption in the three countries. We do not have statistics on per capita wine consumption in California. However, if per capita consumption in the US of 7.4 l per year is an indicator of consumption in California, it is much less than consumption in Australia and Germany. Until the mid 1960s wine consumption per capita in Australia was similar to that in the US today. Since then it has increased considerable and per capita wine consumption in Australia is now approaching consumption levels in Germany where about 23 l of wine are annually consumed per person.

All three regions are large exporters of wine and they compete on World markets. Australia exports about 43 percent of her production, California 12 percent, and Germany 21 percent.

Moreover, for each region the UK is the most important importer of wine. Furthermore, Japan is the third most important importing country for wine from Germany as well as from California.

2.2 Wineries, wine marketing, and market regulations

The size distribution of the three industries are similar in some respects but differ significantly in others. The wine industry in Australia is split into a premium and a non-premium segment. The segment for non-premium wines, which accounts for the larger share in volume, is dominated by four or five companies. The premium segment, in contrast, is populated by about 800 wineries, of which 600 are small and jointly account for less than 2 percent of Australia's wine production. Only about 100 wineries in the premium segment are relatively large and crush more than 400 t of grapes per year (Productivity Commission 1995).

California's about 850 commercial wineries are predominantly family owned and operated businesses. A small number of large wineries have established brands that are well known at home and abroad and they market their produce through conventional retail channels. Many of the small wineries are unknown but to a small band of cognoscenti and they sell directly to consumers.

The wine industry in Germany is characterized by many small wine producers. Marketing arrangements differ among the wine growing regions in Germany. In two regions, Baden and Württemberg, most of the wine is produced and marketed by cooperatives whereas cooperatives play a minor role in other areas. In some areas, such as Pfalz and Rheinhessen, direct marketing dominates the sale of bottled wine, whereas in the Mosel region a sizable share of production is marketed through commercial wine merchants. In Germany, as in Australia and California, there are some large wine trading houses but none that dominate nationally and there are no large wineries with well-established brands.

The regulatory environments differ in the three regions. The marketing activities of the small wineries in California, which do not have extensive distribution channels, are obstructed by wine shipment regulations of most states in the US and only 12 states allow free trade of wine over state borders. In Germany, in contrast, the production of wine is subject to elaborate EU and national regulations but trade in wine is free within in the EU. In Australia production of and trade in wine are subject to few restrictions. Here production is constrained by access to irrigation water, oligopolistic markets for bottles and packaging material, and wine sales suffer from Australia's high sales taxes and complicated tax laws.

3 E-commerce readiness of Australia, California and Germany

E-commerce is trade "...that actually takes place over the Internet, usually through a buyer visiting a seller's website and making a transaction there." (Economist, March 2000). E-commerce requires that buyers and sellers are connected to the Internet, which in turn depends on the availability, quality, and prices of Internet services. E-commerce readiness of a country, region, or industry is therefore described in terms of measures such as Internet hosts per 1000 inhabitants, Internet penetration rate, capacity and cost of data communication lines, etc. For some of these measures official statistics exist. For most, however, official statistics are unavailable and their order of magnitude must be gleaned from various studies, reports, and data collected by private research enterprises. The quantitative indicators of e-commerce readiness

reported in Table 2 confirm the expectation that the US, and by implication California, leads Australia and Germany in nearly all aspects of e-commerce readiness. Glaring exceptions are PC and Internet diffusion in Germany, where, Table 2 could be taken to suggest that a larger proportion of farmers in Germany have embraced PCs and the Internet than farmers Australia or California. We do not believe that this is actually the case. The cause of the difference are different populations to which the statistics refer. In Australia and California the population to which the statistics refer are all farmers whereas the numbers for Germany refer only to the respondents of a survey of among relatively well-educated farmers in south-west Germany.

Table 2: Indicators of e-commerce readiness.

	Australia	Germany	USA	California
Percent of households owning a PC	48 [9]	28 [11]	50 [8]	-
Internet penetration rate [Internet users in % of the population]	41 [9]	19 [7]	42 [7]	-
Percent of households with Internet access at home [2]	22 [9]	21 [10]	47 [2]	-
Percent farms with PCs	49 [3]	90 [1]	47 [4]	61 [4]
Percent of farms with Internet access	18 [3]	57 [1]	29 [4]	46 [4]
Internet hosts per 1000 inhabitants [4]	77.3	34	141.5	-
International Internet bandwidth [Mbps] [6]	729	11612	28308	-
Monthly DSL Internet access fee [US\$ PPP] [6]	-	47 - 72	50 - 100	-
Monthly cable Internet access fee [US\$ PPP] [6]	31	-	33	-

[1] Doluschitz, R. & Pape, J. 2000. Erfolgspotentiale für E-Commerce im Agrargewerbe. 2000.

[2] Lebo, H. 2000. Surveying the digital future. 2000.

[3] Australian Bureau of Statistics 2000. Use of information technology on farms, Australia. March 1999.

[4] USDA/NASS 1999. Farm computer usage and ownership. 1999.

[6] OECD 2000 Local access pricing and e-commerce. 2000.

[7] ITTA 2000. State of the Internet 2000.

[8] www.clicksites.com/internet.html 1999.

[9] Australian Bureau of Statistics 1999. Household use of information technology, Australia, 1999.

[10] 5th GfK Online Monitor 2000.

[11] Machado et. Al. 1997. German Telecommunications.

The dominance of the USA in e-commerce readiness was also recognized by the Economist Intelligence Unit (EIU) which has ranked countries according to their levels of connectivity and "strong online business culture". By these criteria the US (and by implication California) ranks first among all countries, Germany takes 13th place followed by Australia ranked 16 (ITTA 2000).

In all three countries e-commerce is expected to grow rapidly in the near future. Because volume of e-commerce is already high in the USA compared to Australia and Germany, expected annual e-commerce growth rates are lower for the USA than in Australia and Germany (Table 3).

Table 3: Expected growth in e-commerce volume (billion US\$).

	Year					Average annual growth rate [%]
	2000	2001	2002	2003	2004	
USA	488.7	864.1	1,411.3	2,817.2	3.189	46
Australia	5.6	14.0	36.9	96.7	207.6	106
Germany	20.6	46.4	102.0	211.1	386.5	80

Source: Forrester Research Inc. [www.forrester.com]

4 Rapid e-commerce appraisal methods

Staggeringly rapid growth of B2B e-commerce is predicted for many industries, including agriculture, innovative business models are explored, new players arrive in rapid succession, and in some industries some dot.com firms have unglamorously excited. Research that is concerned with a rapidly changing subject must be nimble and its methods must be adapted to the mercurial nature of the research object. We therefore use research methods that are readily applied but are unrefined. In particular, the sample of wineries and wine merchants included in our sample is small and in no way representative of the wine industries in the regions. Our web site inspection methods lack sophistication but they have the advantage that they can be used by novice research assistants with little training.

5 Rapid web appraisal results

5.1 *Sizing the wine space within the web*

We used leading search engines to measure the amount of information available for wine and wine-related topics. The results produced by the search engines varied considerably. For most of our keywords google.com produced the most results, followed by HotBot and Northern Light (Table 4). There also are considerable differences in the performance of the search engines depending on the language of the keyword. AltaVista, in particular, outperforms Google, HotBot, and Northern Light for some German keywords (Tab. 4) used.

Table 4: Results produced for wine-related keywords by leading search engines, December 2000.

Keywords	Search engine:					
	Google	HotBot	Northern Light	AltaVista	Infoseek	Yahoo
wine	4,870,000	2,770,000	2,618,519	2,381,320	583,144	4,482
wine+california	318,000	374,100	332,953	3,678	280	42
wine+australia	218,000	229,400	193,663	1,075	445	376
wine+germany	188,000	198,400	158,660	132	12	1
winery	333,000	198,000	262,655	209,255	88,705	1,265
vineyard	468,000	309,400	443,593	242,995	118,226	978
wine+auction	124,000	82,500	195,814	3,724	2,228	31
wine+auction+california	22,900	21,100	34,383	7	4	3
wine+auction+australia	15,200	15,100	37,255	4	49	5
wine+auction+germany	11,900	11,900	31,593	-	-	1,360
wine+online+store	112,000	510,400	161,574	14	2,563	13
wein	340,000	145,800	194,653	290,970	41,175	6
weingut	58,100	16,700	30,577	68,875	7,388	3
winzer	49,000	19,300	30,614	45,825	7,132	2
weinberg	179,000	116,200	122,180	71,600	18,645	72
wein+auktion	2,770	2,100	2,667	42	262	31
wein+online+verkauf	46,800	-	3,372	-	-	18

5.2 Selection of wineries and wine merchants

We made no attempt to generate a sample of winery and web merchant web sites that is representative in any statistical sense. In the case of the wineries we proceeded in two steps. From the wineries listed in Howard Johnson's wine guide we selected 20 from each region by taking the first and then every (N/20)th winery from these lists, where N is the total number of wineries listed by Johnson for a given region (Australia: 187, California: 314, Germany: 240). We then searched the web for the wineries selected. Of the 60 wineries sampled from Howard Johnson 41, or 68 percent, were found on the web. As expected, most (4 out of 5) wineries from California are already on the web whereas less than two thirds of the Germany wineries maintain a web presence.

Table 5: Share of selected wineries with web sites, by region.

	Wineries surveyed	On the web	% wineries on the web
Australia	20	13	65
California	20	16	80
Germany	20	12	60
total	60	41	68

Twenty web sites of wine merchants from each region were identified directly with the help of search engines. The selection was subjective but the freedom of discretion was limited by the number of wine merchants, which is much smaller than the number of wineries on the web.

5.3 Business models

We grouped the web sites into five categories. "Business card" web sites consist of a web page with no links to other pages at the site. They represent the minimum investment in a web presence. More elaborate are "Information kiosk" sites that provide their visitors with some general information about wine, cooking, or any other information. Information kiosk sites, do not, however, contain information about whether and what the owner of the site has to sell. This, and other information, is provided by web stores. More advanced web stores also allow visitors to order online, but some store-type sites still require their visitors to order through other media than the Web. Finally, there are web sites that also allow visitors to pay online for goods sold on the web.

There is a clear difference between web sites of wineries and web sites of wine merchants: Whereas wine can be ordered and paid for at only about one in five winery sites, it is possible to do so on about four in five wine merchant sites.

Table 6: Type of web presence by region and type of firm

	N	Type of Firm	Type of site				
			Business card [%]	Information kiosk [%]	Web store without online ordering option [%]	Web store with online ordering option [%]	Web store with online ordering and payment option [%]
All	102	Overall	6	16	12	11	56
	41	Wineries	15	37	22	5	22
	61	Wine merchants	0	2	5	15	79
Australia	33	Overall	9	15	12	0	64
	13	Wineries	23	39	23	0	15
	20	Wine merchants	0	0	5	0	95
Germany	32	Overall	6	19	6	34	34
	12	Wineries	17	50	17	17	0
	20	Wine merchants	0	0	0	45	55
California	37	Overall	3	14	16	0	68
	16	Wineries	6	25	25	0	44
	21	Wine merchants	0	5	10	0	86

Although our sample is small, results suggest regional differences among merchants' sites. Most merchants from California and Australia allow customers to order and pay online whereas less than half of the German merchants' sites provide online payment services. The likely cause for this are differences in payment instruments used in the three regions. In Germany payment often is possible offline by debiting the buyers bank account and credit cards are not as widely and intensively used by German consumers as by consumers in the US or Australia, whether payment is off- or online.

Table 7: Payment option provided by region and type of firm

			Pay before	Pay after	Credit card	Customer account
	N	Type of Firm	[%]	[%]	[%]*	[%]
All '	102	Overall	23	21	59	1
	41	Wineries	5	7	32	0
	61	Wine merchants	34	30	77	2
Australia	33	Overall	18	3	67	3
	13	Wineries	8	0	23	0
	20	Wine merchants	25	5	95	5
Germany	32	Overall	41	63	28	0
	12	Wineries	0	25	0	0
	20	Wine merchants	65	85	45	0
California	37	Overall	11	0	78	0
	16	Wineries	6	0	63	0
	21	Wine merchants	14	0	91	0

* Pearson`s Chi-squared test for contingency table (acceptance of credit cards by country) is significant at the 1% level.

' Pearson`s Chi-squared test for contingency table (acceptance of credit cards by type of firm) is significant at the 1% level.

5.4 Visitor identification

Web sites are easy for users to visit and to leave again. For the operator of a site it is of interest to identify among the many visitors those that have visited the site before. To be able to do that visitors must be identified. Two methods are common. Either the web sites tags a visitor with a cookie placed on the harddisk of the visitor's computer or the visitor is asked to register at the site, or both.

None of the winery sites from Germany set cookies on our computer but far more than a third of the winery sites from Australia and the US placed cookies (Tab. 8). Wine merchant sites use cookies much more frequently than winery sites. Nearly all merchant sites from Australia and California employ cookies but only less than half of the German merchant sites use this technique to mark and identify visitors.

Table 8: Sites sending cookies

	Wine		All [%]*
	Wineries [%]	merchants [%]	
All '	29	77	58
Australia	39	95	73
Germany	0	45	29
United States	44	91	70
N	41	61	102

* Pearson`s Chi-squared test for cookies set by countries is significant at the 1% level.

' Pearson`s Chi-squared test for cookies set by type of firm is significant at the 1% level.

Similarly, US-sites and Australian sites even more so, often ask or allow visitors to register. None of the winery sites from Germany used this option for identifying visitors and less than half of the German wine merchant sites provided for visitor registration.

Table 9: Sites with registration option

	Wine		All [%]*
	Wineries [%]	merchants [%]	
All '	12	49	34
Australia	15	75	52
Germany	0	40	25
California	19	33	27
N	41	61	102

* Pearson`s Chi-squared test for cookies set by countries is significant at the 1% level.

' Pearson`s Chi-squared test for cookies set by type of firm is significant at the 1% level.

5.5 Export orientation

Two properties of web sites are taken as indicators of export orientation: (1) acceptance of orders from abroad and (2) foreign language options. Of the two indicators the second clearly is the weaker one. Most probably there are much more wine consumers in the major wine importing countries who speak English than there are consumers with a knowledge of German. Therefore, wineries and merchants from Germany have a much higher incentive to include an English language option in their sites than the sites from Australia and California have to include a foreign language option.

5.6 Link density of wine portals

Portals are web sites that serve two purposes: to provide users with information from a certain domain and to serve as starting sites for web users. We identified 18 wine portals each from California and Germany using search engines. Typically, the wine portals provide information related to wine, some also allow commercial transactions, and all contain links to other web sites. We inspected the links to see how densely the portals are linked to each other. We then calculated the link density L according to the following formula:

$$L = \sum_i \sum_j l_{ij} / (N * (N-1))$$

where: $l_{ij} = 1$ if a link leads from portal i to portal j and $l_{ij} = 0$ otherwise

N : number of portals.

Surprisingly, link densities were rather low at 0.11 for the German wine portals and 0.04 for the Californian ones. We do not know whether the low link densities reflect portal owners' concern about losing users to other portals, or whether portal designers indeed focus more on providing information rather than facilitating access to information provided by others.

6 Insights and implications

The purpose of our rapid web appraisal was to answer several questions. The first question was concerned with the differences between the wine industries in the three regions with respect to characteristics that are likely to be important for the adoption and use of e-commerce by the wine industries. All three industries have a strong export orientation but Germany consumes a larger share of her wine domestically than California and Australia. Furthermore, the wine industry in Germany is characterized by many small wine producers who market much of their wine directly. In Australia and California, in contrast, large commercial wineries account for a much larger market share than in Germany. Here wine brands are much less important than in Australia and California.

The countries differ in e-commerce readiness. As was expected, e-commerce readiness is high in California whereas Australia and Germany lag behind. Although the differences are not of an unbridgeable magnitude, they are probably sufficiently large to provide the wine industry of California with a competitive edge.

Results of our inspection of small samples of web sites of wineries and of wine merchants suggest that web activities of wineries in California and Australia are more strongly focussed on selling wine on the web, whereas German wineries tend to emphasize the provision of information about the winery. Web sites of wine merchants are more homogenous and, with one exception, we did not find any significant regional differences. The exception are the payment option provided. Probably because credit cards are less frequently used in Germany in general, credit cards are less frequently accepted by German wine sellers on the web than by Californian and Australian wine sellers.

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