APPLIED TECHNOLOGY, MARKETS AND PRODUCTION ATTITUDES OF "ORGANIC" WINE PRODUCERS IN EUROPE

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Abstract
Within the ORWINE project, a VI FP project funded by EU Commission to obtain scientifically based recommendations for the development of an EU "organic wine" regulation, a wide survey among organic wine producers throughout Europe was carried out at a first instance. The survey was based on a internet questionnaire and a set of in-depth interviews.

The survey was first carried out via internet in order to touch as many producers as possible. The questionnaire, composed of a total of about 30 questions, was made available in 5 languages and proposed through several national producer Associations.

Most of the hot issues of the internet survey have also been developed in the in-depth interviews, which were run later on 78 producers from 10 different countries.

The results define an interesting picture of how presently the European organic wine producers make and sell wine: size of the production units, major clients, export share, most common grape diseases, available equipment, additives and winemaking practices, SO_2 management in white and red wines. Moreover, the survey asked for opinions and production philosophy, allowing us to draw a broad picture of the present status of organic wine production in Europe and future regulatory needs and constraints.

Introduction
Organic viticulture in Europe is practiced on about 80.000 ha; the number of commercial wineries producing wine from organic grapes is above 2.500, mostly located in France, Italy, Germany, Austria and Switzerland.
Although this segment of wine production represents only a small fraction of the overall wine made in Europe, the production of wine with minimum external inputs and maximum respect for the original character of the grape is appreciated by an increasing number of consumers.
ORWINE is a VI FP project funded by EU Commission to obtain scientifically based recommendations to develop EU "organic wine" regulation. The project has the aim of defining the best winemaking practices, to be used to obtain high quality wines, using the most soft technologies currently available.
Part of the project was to draw a precise picture of organic wine production in Europe. A wide survey was then conducted to better understand the present situation , and to gather producers' opinions and standpoints.

Methodology
Given the population (over 2.500 wineries) and the geographical location of the targeted people, two criteria were used to collect information

- a web survey, with the goal of gathering answers from a significant sample;
- an in-depth interviews, made with a restricted number of people chosen among opinion leaders and important commercial realities.

The web questionnaire was run from June to December 2006 and it was composed of 30 questions. Five language versions (English, French, Italian, German and Spanish) were made available on line. The invitation to stakeholders to participate in the survey was disseminated through e-mailings, articles in the specialist press and even personal phone calls and messages. Different recalls, before and after harvest period, helped to obtain a fairly wide sample. The web questionnaire was fully answered by 467 persons, representing about 18% of the target population. Of these, 192 gave valid answers from France, 122 from Germany, 66 from Italy, 33 from Austria, 24 from Switzerland, 13 from Spain. Other participants answered from Portugal, Slovenia, Croatia, Czech Republic, Hungary and other countries.

The interviews were conducted in Italy (26), France (13), Germany (13), Switzerland (8), Austria (6), Spain (4), Portugal (3), Hungary (3), Slovakia (1) and Cyprus (1). In addition to the questions asked in the web questionnaire, it was possible, in the interviews, to get into more detail on viticulture practices and philosophy of production. They were conducted with the dual purpose of confirming the data gathered through the web survey and collecting more qualitative results.

Survey results

The present paper only summarizes the most significant results obtained from the survey, which are described in greater detail in the official deliverable D 2.5 of the ORWINE project (available on internet on www.orwine.org) .

Producer profile

Most of the wineries producing organic wine in Europe are small to medium sized (Fig 1).
Only about 8% have a yearly production exceeding 200,000 bottles. The rest of them are almost equally represented by small (less than 300 hl / 40.000 bottles) and medium sized wineries (between 300 and 1500 hl / 40-200.000 bottles). The percentage of small sized wineries is higher in Switzerland and Austria than in Germany, Italy and France.

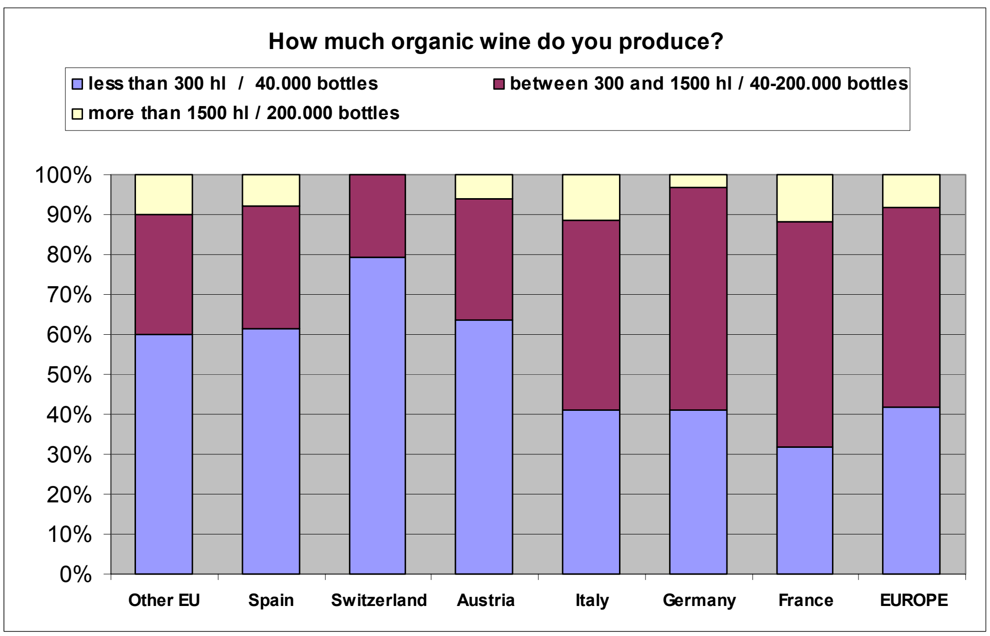

Figure 1. Quantity of organic wine produced by single wineries. Web survey.

The great majority (94%) of the wineries producing organic wine in Europe is specialized in this production. Eighty-seven percent of them produce organic wine as an exclusive product, and for 7% of them, organic wine represents more than 50% of their production.

Results from in-depth interviews show that the majority of organic wine is produced under appellation (AOC -appellation d'origine contrôllée). "Variety related" wines are present, with lower significance, in all countries. Table wines are a minority.

About 50% of the organic wine producers in Europe switched to this production method more than 10 years ago. One third of those started organic wine production only few years ago. These new stakeholders represent about 40% in Austria, more than 80% in Spain and 60% in Other Europe.

The majority of the producers stated that environmental concerns was the main reason for converting but often, especially in Germany, the technical reasons were more important. The technical reason is explained in terms of "research of production methods that allow for improvement in wine quality in terms of "terroir" relationship and "authenticity". In Italy, France, Spain, Portugal, Hungary and Slovakia market demand has a certain importance but must be considered in two different ways:

- For large farms it represents an important export opportunity
- For small/family farms it is felt to be the only possibility for surviving high competitive pressure from larger producers and from imports.

Vineyard management

Concerning the choice of propagation material or choice of variety, it has been clearly stated by producers that organic vines are not easily available. There are only a few nurseries, which started their production less than 5 years ago. Also, a large part of the interviewed farmers had their vineyard planted before converting to organic, which is a further reason for almost exclusive use of conventional plants for producing organic wine. Modern resistant hybrids have high relevance in Germany, Austria and Switzerland, but they are not used at all in other countries (in Italy for instance also for legal reasons).
In Italy, Austria, Spain, Portugal and Cyprus the use of autochthonous varieties is increasing and it is likely not to be linked only to organic production but to a general trend in wine-production.

In general terms, compost is widely used in all countries except for Italy, where commercial organic fertilizers are used by a large part of the producers. Green manure, implemented in many different ways and with different species, is widely used with the exception of France. In all countries, only a few farmers do absolutely nothing to fertilize their vineyards.

Soil management has been declared to be the main difference after the conversion to organic vineyard management. When comparing the practices used by the interviewed producers, a high level of attention and experience is gained in soil management, with 80% of the producers performing their sequence of tillage with a wide range of tools. At the same time, there is a clear attempt to maintain a year-round cover crop on the total surface area of the vine-yard.

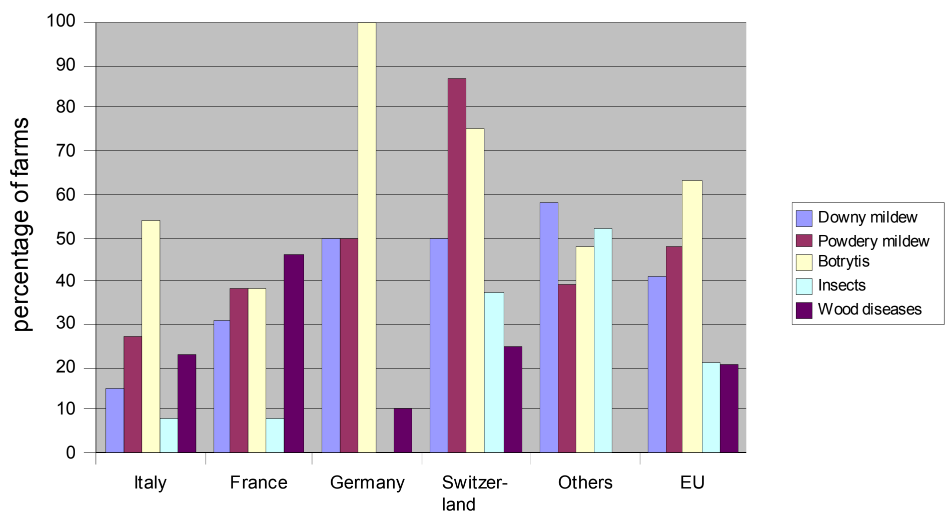

Figure 2: frequency and incidence of pest and disease in organic grape production as resulting from in-depth interviews.

Many scientists agree that the frequency of mold disease which can negatively affect wine quality approaches 10%. This disease level is rarely reached in countries like Spain, Italy and France, according to producers' statements, but is more frequent in others like Germany, where 70% of the producers must face this situation at least every 3 years. This depends, of course, on the climate and it has a large influence on winemaking technology, specifically on SO_2 additions.

Unfortunately, where grape diseases are more frequent as in Germany, Austria and Switzerland, *Botrytis* is the major problem (Fig.2). Powdery mildew, the second disease in terms of potential negative effect on wine quality, is also a major concern in Spain, Italy, and France, as well as in other countries. Downy mildew is never reported as a major problem because of the common and successful use of copper fungicide even in reduced doses.
Copper and sulfur are used by more than 90% of EU producers, while insecticides such as *Bacillus thuringiensis* and Pyrethrum are limited to specific conditions of severe insect attack.

Under similar growing conditions and for similar wines, the large majority of interviewed producers claimed to produce lower amounts of grapes as compared to their conventional colleagues (usually AOC limitations). Only a few farms in Switzerland, Italy, France and Spain managed to reach comparable yields. Nevertheless almost all producers declared that lower production is not a problem but is a technical choice that improves wine quality.

Organic wine market

Bulk wine trading in Europe seems to be rather limited: 57% of the wineries sell their wine exclusively bottled. It must be stressed that these figures represent the number of wineries and not the volume of wine involved in bulk trading. It should also be noted that in some countries (i.e. Italy) bulk wine trading is more significant as compared to the European average and comprises more than 50% of the organic wine producers.

Direct sales to private clients visiting the wineries are by far the predominant market for organic wine in Europe (Fig.3). About 85% of the stakeholders specify this form of selling as one of the two most important. The only exception seems to be Spain, where other channels predominate.
Restaurants and wine shops are also very important clients especially in Spain, Italy, France and Switzerland.
Traders are important in Spain, Austria and Italy, but of less importance in the other countries.
Supermarkets are the main clients for a small percentage of producers (9%), more or less corresponding to the percentage of larger sized wineries.

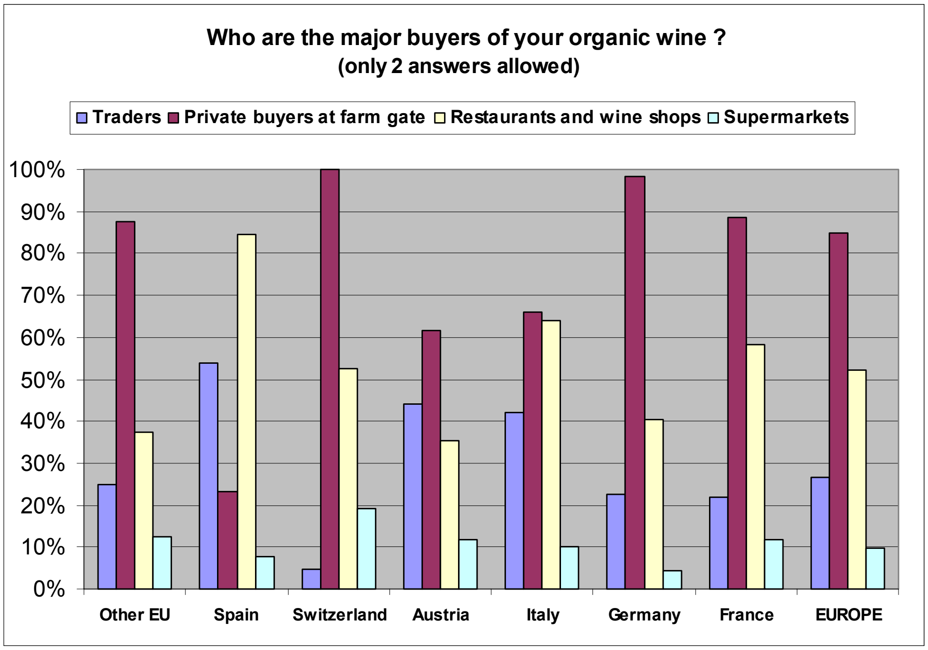

Figure 3: Main distribution systems for organic wine. Web survey

During the in-depth interview, the question was asked, whether the market situation was different since conversion and different situations were found in the various countries. In Italy, 7 % claimed a different market situation, while Germany claimed no changes. In France and Switzerland an intermediate situation was seen. The ‘other’ countries, Hungary, Spain and Portugal, reported a change in market situation while Austria claimed that no changes took place.

Globally, more than 30% of the European organic wine producers export their wine to foreign markets, and for 10% of the producers, this is the majority of their production (Fig.4). It must be specified, though, that almost all exporting wineries were located in Italy, France and Spain, where conversion to organic production was decided also as an opening to possibilities in the export market.

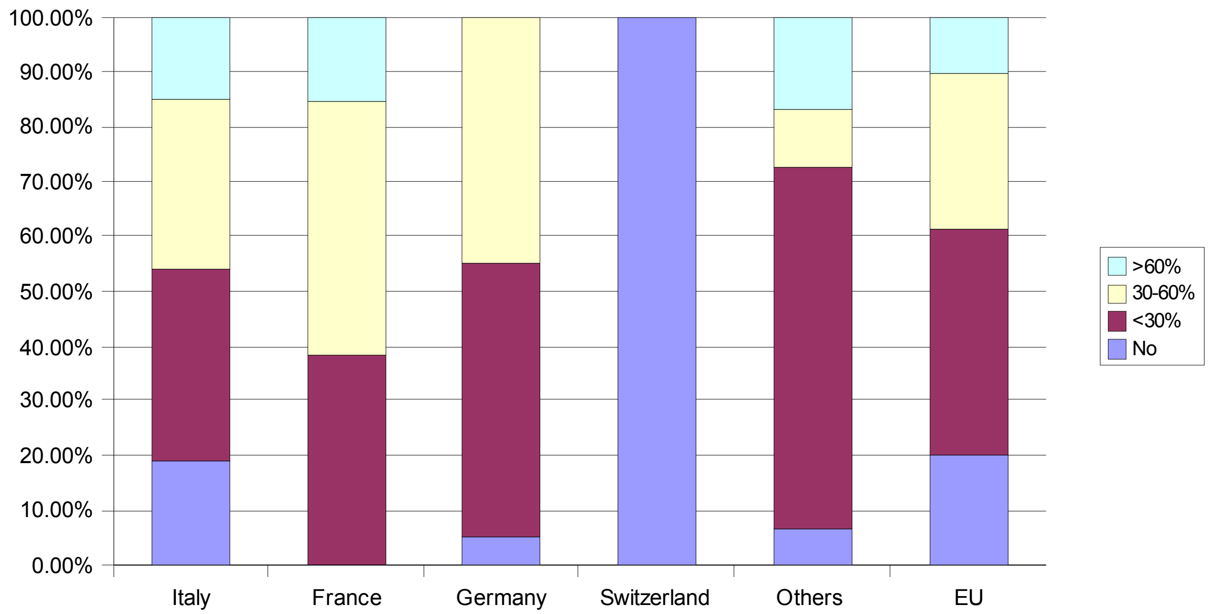

Figure 4. Relevance of export market for organic wine producers. In-depth interviews

The majority of producers don't apply higher prices to organic wines as compared to conventional ones of same origin and market segment: a better remuneration is generally obtained only in Germany and Austria.

When interviewed producers were asked to describe their wine, the most frequent definitions were "easy to drink", "healthy drinks", "more terroir driven", "mineral flavor" and "authentic". Interestingly, the only specific definition for organic wine as used by producers was "healthy wines", and this descriptor is used by about 40% of the producers. It seems evident there is a lack of specific selling arguments for organic wine, as most are the same as for conventional wine.

<u>Origin of raw material</u>
Most of the producers of organic wine rely on their own grapes. Eighy-four percent of them uses their grapes exclusively and an additional 13% uses their own grapes for more than 50% of the organic production (Fig. 5).

Only a very small percentage (7%) of the producers participating in the survey purchased some certified grape juice, and also, in these cases, the bought juice accounted for less than 50% of their total production.

Bulk trading in organic wine is limited to 14% of producers. Nevertheless, in terms of volume, this trading is much more significant, indicating the existence of a few important traders at international level.

Ninety-one percent of the organic wine producers in Europe is bottling their wine in-house, either by using their own equipment (52%), or through an outside service (39%).

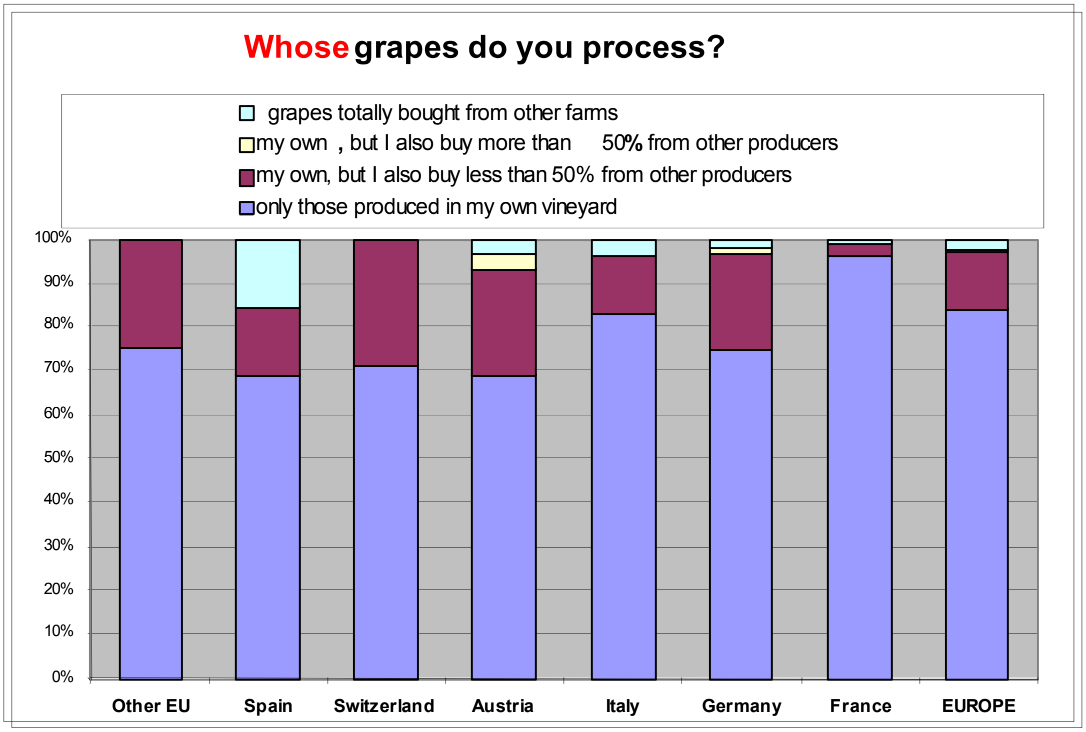

Figure 5. Origin of grapes used in Europe to produce organic wines. Web survey.

Equipment available, use of additives and winemaking practices

The equipment available in wineries used to produce organic wine does not seem to differ from that found in conventional wineries of the same size. Generally speaking, organic producers make use of rather good technology, which allows them to produce wine of good quality.

Interestingly, about 74% of the wineries have cooling systems and 50% possess a heating system. Also, many interviewed declared that temperature control devices are high up in the list of future investments. Temperature management can then be taken into account as one of the major tools already available for low impact winemaking technology.

The percentage of people using (or accepting) chemical additives is very low, and this represents the major difference compared to conventional winemaking.

Biological tools are more widely accepted and used. Sixty-seven percent of the organic wine producers use commercial active dry yeast. This percentage is lower in France (51%), but reaches 80-90% in Germany, Italy and Switzerland. Nonetheless, many interviewed expressed a preference for the use of in-house selected yeast cultures, when available. Forty-four percent of the producers use/accept organic yeast nutrients and 32% use/accept ammonium salts. Commercial bacterial starter cultures are very common in Germany (68%) and Switzerland (53%), but their use is almost negligible in other countries like France (8%) and Italy (17%). Lysozyme, an antibacterial compound extracted from egg whites, active against malolactic bacteria, and very recently authorized in EU, is used or accepted by only 7% of producers.

Among antioxidants, Ascorbic acid (Vitamin C) is accepted or used by 15% of European organic wine producers. This percentage increases to 24-25% in Italy and Germany. 21% of European producers use wood tannins and 16% use grape tannins.
Copper sulfate is used to remove sulfides from wine by 60% of German producers and, overall, by 25% of European producers.

The most widely accepted winemaking practices were barrel aging (80%), extended lees contact (80%), barrel fermentation (62%), and low temperature fermentation (62%). Other practices had a larger acceptance in some countries, like for instance reductive winemaking in Germany. In-depth interviews asked producers if there are practices they used before converting to organic techniques but are no longer using. It appears that only few of them changed practices since converting.

The question of a few innovative practices (wood chips, concentration, cryoextraction, spinning cone, flash pasteurization and electrodialysis crystal stabilization) was put to interviewed producers and common opposition to all of them was voiced.

SO_2 use and content in final wines

For dry white wines, a final maximum amount of 90 mg/l of total SO_2 would reflect the present situation for about 70% of the European wine producers, but this limit would satisfy only 43% of the German producers, less than 70% of the Austrian producers and 77% of the Swiss producers (Fig. 6). In these countries, due to different climatic conditions as well as disease type and frequency, SO_2 addition must be considered differently as compared to warmer countries.
The biggest additions are done during the storage and finishing phase, while 60% of the producers do little (< 25 mg/l) or no addition before fermentation and bottling.

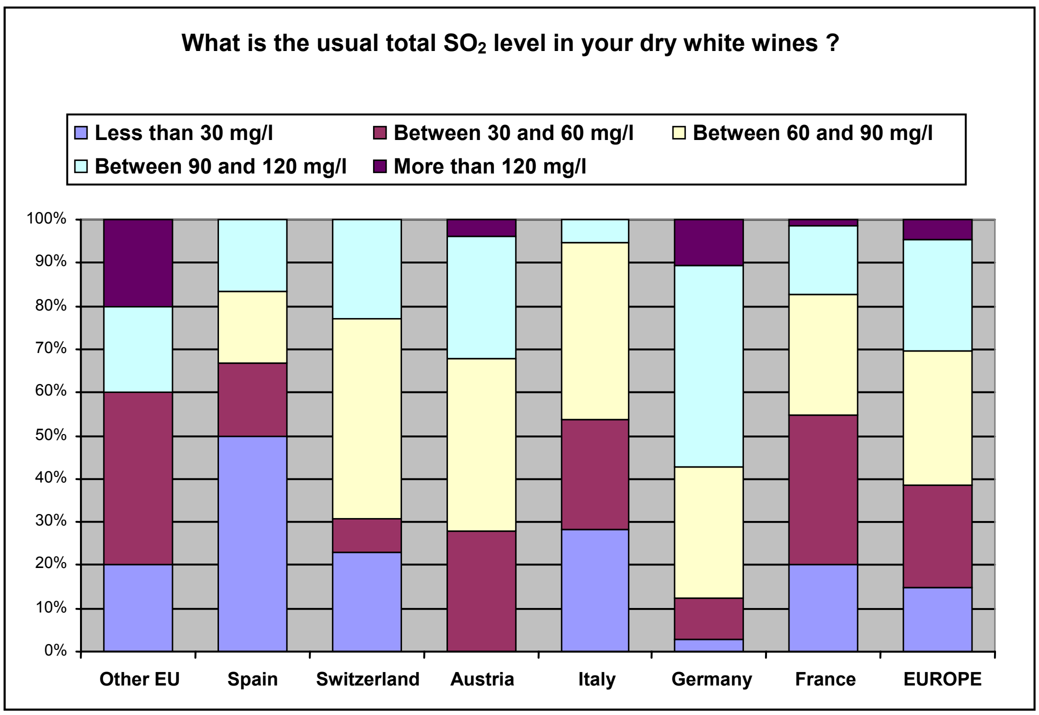

Figure 6. Stated total SO_2 content in organic dry white wines. Web survey

In red wine production, the overall percentage of producers introducing little or no SO_2 at crushing increases to 70%. Sixty percent use as little or none at bottling. The final total sulfur dioxide content declared for red wines is lower than for white, and a hypothetical limit of 90 mg/l would satisfy almost 100% of the producers in most of the countries, with the exception of Germany and Switzerland where more SO_2 seems to be required (Fig. 7).

These data have found confirmation in some analytical data obtained on entries in two major organic wine competitions, respectively in Italy and Germany. The majority of the samples showed an SO_2 content between 20 and 90 mg/L for the 201 Italian wines, and between 70 and 120 mg/L for the 60 German wines analyzed.

In the interviews, almost all producers (from 88% in Italy to 100% in other countries) stated they use SO_2

on all wines they produced. The small amount produced without SO_2 is due to experiments in the production of sulphur-free wine.

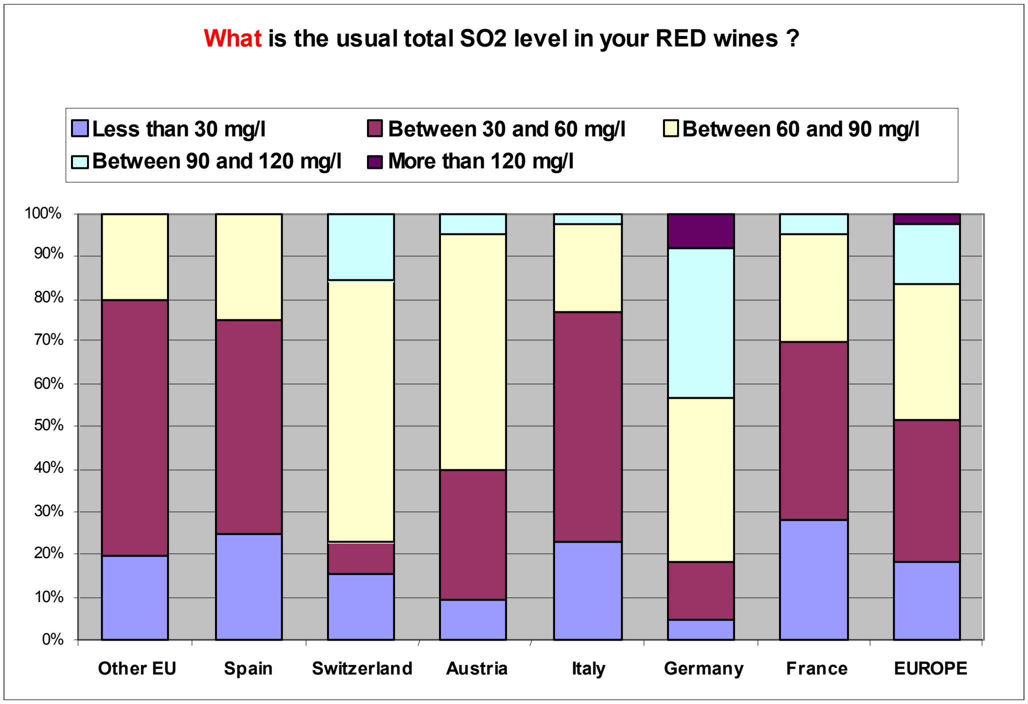

Figure 7. Declared total SO_2 content in organic red wines. Web survey.

Present regulatory situation and expectations

Both the web-survey and the in depth interviews asked producers to state their present legislative references and at what level (EU, national or private) they feel that organic wine should be regulated in the future.

At present, the situation is quite different as between countries. In Germany and Switzerland the great majority of producers are certified for wine production under a private label (including organic and Bio-dynamic standards), while in France and Italy only a portion of them are following private standards.

The answers obtained by the web survey indicated an 88% association with private standards in Germany, 100% in Switzerland, 40% in Italy and 56% in France. The remaining producers adhere only to EU regulations concerning organic grape production.

Considering all the answers to the question “at what level do you think the following issues should be regulated in future concerning organic wine?”, a strong consensus in favor of a regulation on additives, processing aids and wine labeling at EU level was expressed, while opinion on limits to the amount SO_2 was almost equally divided between regulating at national and EU level. The use of specific technology is mainly expected to be regulated at the EU level but a significant percentage is in favor of the national level and even the private level (Tab.1).

However, opinions on this point are rather different from one country to another. Germany seems to demonstrate a positive experience with private labeling while other countries are more trusting of the EU than of national or private logos. Also, “export” countries prefer internationally established rules because these make it easier for them to cope with different markets.

	EU	National	Private
Use of additives and processing aids	82	48	38
SO_2 limits per wine type	52	59	37
Use of specific technologies	55	35	35
Organic wine labelling	81	21	7
Other issue			

Table 1. Organic wine producers' expectations regarding the desired regulatory level for various issues. In-depth interviews

Conclusions

The survey defines a significant and clear picture of who the EU organic wine producers are and how they work in the vineyard and in the cellar. The integration of the web-based survey with in-depth qualitative interviews assures a significant degree of representation. A significant number (20%) of EU organic wine producers was involved.

According to the survey results, the typical European producer of "organic" wine has a small-to-medium sized estate, growing his own grapes with viticulture practices very close to conventional ones, but with total exclusion of synthetic chemicals and fertilizers and a great focus on the expression of the "terroir" and of the characteristics of typical varieties.

The winery is normally equipped with technology coherent with the scale of their facilities. The producer tend not to accept newly introduced technologies, and they prefer to adapt and fine-tune the traditional practices to avoid quality problems. In this effort, the winemaker shows a clear preference for biological and physical tools rather than chemical ones. Temperature control, management of microbiological phenomena through use of starter cultures, extended yeast lees contact and barrel use seem to be the presently preferred winemaking techniques. Additives and aids are used only in case of absolute need when other solutions are not available.

SO_2 level is already a major concern for the typical organic wine producer; he tends to fraction the addition and to reduce it to the minimum required level. The final result is already rather good, as most of the wines, white and red, show a final level of total sulfur dioxide well below the legal limit for conventional wines.

Nevertheless, the equipment already available, the general acceptance of a certain number of practices and biological tools, and especially the great concern for wine quality, show yet the possibility to further increase the quality and the healthiness of organic wine through the broad application of a coherent winemaking strategy.

The organic wine produced is typically sold to private buyers at farm gate or distributed to specialized shops and restaurants. Only consumers in Northen Europe recognize an higher value in wine produced with natural practices, while in Southern Europe the name "organic" does not represent a commercial advantage. For this reason many producers in Italy, France and Spain actively explore the export market.

The typical organic wine producer does not use special selling arguments: he just stresses his respect for the territory, local varieties and tradition. However, he feels the need of a legislative framework to support and reinforce his marketing action.

Regulation at EU level is clearly demanded, but it is expected to have a certain flexibility so as to meet the different needs of specific wine regions and to respect the role of private initiatives which are recognized to have played a positive role in the development of organic wine.

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